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**The effects of variety and bundling on choice and satisfaction:
Applications to new telecommunication and media services**

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PREFACE

This working paper presents a discussion of literature on how variety and bundling influence choice and satisfaction. The discussion is applied on telecommunication and new media services. The working paper is written as a part of the SNF-project 6255, Debussy – “Designing Business Models for Customer Value in Heterogeneous Network Services”. The working paper is written by Per Egil Pedersen and Herbjørn Nysveen, where Per Egil Pedersen is mainly responsible for the sections and paragraphs on assortment and Herbjørn Nysveen is mainly responsible for the sections and paragraphs on bundling.

Bergen, December, 2009

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CONTENTS

| | |
|---|----|
| Abstract | v |
| 1. Introduction..... | 1 |
| 1.1 Problems | 3 |
| 1.2 Approach, method and organization | 6 |
| 2. Assortment, choice and satisfaction | 8 |
| 2.1 Assortment characteristics | 9 |
| 2.2 Perceptions of the assortment..... | 10 |
| 2.3 Perceptions of the choice situation | 10 |
| 2.4 Choice | 11 |
| 2.5 Perceptions of the choice..... | 14 |
| 2.6 Experience with the chosen option..... | 15 |
| 2.7 Summary table | 16 |
| 3. Bundling, choice and satisfaction..... | 21 |
| 3.1 Bundle characteristics..... | 21 |
| 3.2 Perception of the bundle | 24 |
| 3.3 Perception of the choice situation | 27 |
| 3.4 Choice | 27 |
| 3.5 Experience with the chosen option..... | 28 |

| | |
|---|-----|
| 3.6 Summary table | 29 |
| 4. Variety and bundling in new telecommunication and media services | 36 |
| 4.1 Variety..... | 37 |
| 4.2 Bundling..... | 44 |
| 5. Conclusions and discussion | 52 |
| 5.1 Conclusions..... | 532 |
| 5.2 Research implications..... | 53 |
| References | 55 |

ABSTRACT

The purpose of this working paper is twofold; 1)to review consumer behavior literature on how assortment variety and bundling influence choice related variables, and 2)to apply this review on an analysis of telecommunication and new services. Literature related to the characteristics of assortment/bundle, perception of the assortment/bundle, perception of the choice situation, choice, perception of the choice, and experience with the chosen option is reviewed with focus on assortment and bundling. The review is based on an open literature search using keywords as “assortment size”, “assortment variety”, “bundling” and “unbundling” in databases as ISI and Ebsco. In addition, manual reviews of references used in the articles revealed from the databases have also been used to make sure we cover as many relevant articles as possible. The articles reviewed are briefly summarized in table 1 (assortment studies) and table 2 (bundling studies).

Based on the literature reviewed, the results revealed are applied in a theoretical analysis of the effects of variety and bundling on choice- and post-choice related variables in new telecommunication and media services. Six services are discussed; traditional telephony and broadband services, mobile internet services and applications, services in heterogeneous access networks, multiplay services, TV-channel network services, and online video services. The analyses focus on potential effects of assortment variety and bundling on choice and post choice related variables for each of the six services. Because regulatory authorities typically use variety to stimulate efficient competition, some regulatory issues of relevance for each of the six services are also briefly discussed.

The main results from the general consumer literature review on variety and bundling is summarized. A brief summary of what seems to be the most relevant issues related to variety, bundling, and regulatory actions for the six telecommunication and media services analyzed is also presented. The review of the literature and the analyses of the six services show a significant need for research on how variety and bundling influence choice and choice related variables. A discussion of potential routes for future research together with a preliminary draft of a research model closes the discussion of this working paper.

1. INTRODUCTION

When studying the effects of value proposition designs on customer perceived value in early 2008, we found that value proposition variations were not easily reflected in manipulation checks of value proposition perceptions (Pedersen et al., 2008). We also explicitly tested the effects of offering variety as a particular value proposition, and found that variety was not easily reflected in consumers' value proposition perceptions (Pedersen and Nysveen, 2009). These findings led to an investigation of the topic of variety in value proposition design in telecommunications and new media services. It then became apparent that the topic of variety is highly relevant to both value proposition design and to regulation of such services.

At least six different service areas could be identified where variety is a "hot topic" among managers and regulatory authorities in telecommunications and new media services. One topic is the importance of *variety in regulation of consumer markets in traditional telecommunications services*. What is discussed is the effect of variety in service plan offerings to competition in these markets. A second topic is an ongoing debate on *bundling and a la carte choice in TV-channel networks*. According to Rennhoff and Sefres (2008), consumers increasingly complain about rising cable television prices, and a la carte offerings is suggested to contribute to lower prices, but it will also both affect variety and represent a difference in assortment variety to consumers. A third topic is that of *open access networks and variety in the service offerings of these networks*. It is discussed whether next generation access networks (e.g. Caio, 2008) should be regulated in ways similar to fixed copper networks and/if these networks should be forced to include a variety of offerings from diverse service providers. Such regulation would increase the variety of services offered through these networks and most likely affect competition, prices, innovation, and consumer behavior. A fourth topic is that of how *consumers cope with the increasing hyperchoice offerings* - offerings where assortments reach several thousand options, of online music and video services. Findings from Brynjolfsson, Hu and Smith (2003) suggest that consumer surplus from hyperchoice may be as much as ten times that of lower prices in online book stores. Online video and music stores are characterized by the same hyperchoice but we know relatively little of how consumers cope with this hyperchoice. Recent research by Brynjolfsson, Hu and Siemester (2007) suggest that search tools and recommendation agents are the reasons why consumers are able to create value from the enormous variety of content. A fifth topic is how business models should be designed for *mobile Internet and -applications*

markets. So far, experiences with such services range from success stories in some Asian markets (e.g. Henten et al, 2004) to failure stories in Europe (e.g. Methlie and Gressgård, 2004). One of the reasons sometimes mentioned for this difference is that of quality controlled/moderate variety versus open/high variety value propositions on the complements platform for services (Henten et al., 2004). Studies of consumer reactions to moderate versus high variety value propositions in the mobile Internet and applications markets, however, have hardly been reported, if at all. The final topic that originally proved the basis for the research project that this paper is linked to was that of *variety in new heterogeneous access networks services*. For example, it has been suggested that next generation networks would offer a variety of services accessible through a variety of access networks, all based on the same or very similar underlying standards – Internet standards. Research projects, such as the “Ambient Networks” project has even suggested that access should be controlled by much more end-user involvement in handling this variety (Ho, Markendahl and Berg, 2006), but again, hardly any studies on consumer reactions and consumer behavior consequences of such a large variety proposition has been published. For example, in the “Ambient Networks” project, we were unable to find any consumer studies among the deliverables of the project that discussed the fundamental assumption that consumers will want and are able to handle such a scenario in a value enhancing way (increasing consumer value and consumer surplus).

The situation described above has made us suggest that an inquiry into the consumer behavior literature on assortment variety and bundling could cast new light on many of the implicit assumptions of consumer behavior made in telecommunications and new media value propositions and regulatory guidelines. Recent findings in consumer behavior literature, however, offer somewhat conflicting results on the effects of variety on consumer choice and satisfaction. Whereas earlier studies of the effects of variety on choice and satisfaction indicated that variety increases consumption, probability of choice, market share and customer satisfaction (see Lancaster, 1990), recent studies have started to question these simple relationship. Some studies suggest that variety in the form of assortment reduces the probability of choice in general (Iyengar and Lepper, 2000), while other suggest that this relationship is not universal but depend on other moderating conditions (e.g. Chernev, 2003). Furthermore, other studies suggest that even if there is a positive relationship between assortment variety and choice, there may be a negative or inverse U-shaped relationship between variety and customer satisfaction (e.g. Schwartz et al., 2002). Thus, a number of

problems should be addressed regarding the consumer behavior literature on variety as well as its applicability and implications for telecommunications and new media services.

1.1 Problems

A number of problems have been briefly touched in the introduction. These may be organized first, by problems related to providers' value propositions, and second, by problems related to regulatory policies. In both these problem areas, variety is relevant and has implications for both consumers and suppliers. Much of the industrial organization literature on telecommunication markets focuses supply side consequences and models market developments under alternative provider or regulatory authority conditions. Here, however, we focus purely on the consumer behavior consequences of variety. Thus, the assumptions often made in industrial organization models of consumer behavior are questioned. It may be that, as in other areas of behavioral economics, such investigations enable model refinements in industrial organization studies.

The most important dimension of service providers' business models is the value proposition (Johnson, Christensen and Kagermann, 2008). Designing the value proposition includes deciding which attributes will provide value to customers - intrinsic, extrinsic or network attributes. Variety and bundling are related to all these attribute types. For example, utility may be increased by variety if the findings of Brynjolfsson, Hu and Smith (2003) are relevant to the services studied here. Extrinsic attributes like pricing is relevant if there is cost savings to be obtained at either the supply or demand side of bundling or unbundling. Finally, services that are bundled may be complementary creating network value through indirect network effects with increasing variety of the complements network. The general decision problem addressed here is thus, how value propositions should be designed with respect to variety and bundling when considering consumer behavior and consumer value issues. This decision problem will have to be solved by decision makers. What we, as researchers, can address are the research questions providing decision makers with information and knowledge on the decision problem at hand.

At least five research problems may be derived from this decision problem. One considers the dimensions of variety and bundling in telecommunications and media services, as well as how these dimensions are perceived by consumers. An example is what assortment sizes and

structures are perceived as varied, and how does this differ between service areas? It seems likely that perceived variety differs considerably across service areas. If consumers are able to handle the variety of online bookstore assortments of several thousand options, it seems odd that they have problems deciding when assortments include only 30-40 options, as suggested in the “too-much-choice” literature (Scheibehenne, 2008).

This leads to the question of which characteristics of the assortment lead to high perceived variety, not only in theoretical dimensions but also in practical dimensions as assortments are organized and presented in offline and online stores. As the literature on assortment and bundling is incompatible with respect to the characteristics of the assortment being studied, it is difficult to generalize these findings across different products and services. In particular, one may raise the question if assortment characteristics influencing perceived variety differ between products and services, and in particular between traditional products and digital services - which may be differentiated with very low costs.

Once the determinants of perceived variety are established, one may ask how this affects choice and satisfaction. The studies referred to above suggest that there is a decreasing positive or inverse U-shaped relationship between perceived variety and choice. An important question is whether the assortment sizes seen for different new media and telecommunication services are close to the point where such effects occur? Since assortment sizes of many of these services are likely to increase considerably, adverse effects may occur.

While it may be suggested that the adverse effects of assortment size are universal, very few studies suggest that this is the case. Instead, mediating and moderating variables are believed to play an important role in producing “too-much-choice” effects. A question, thus, is if these mediating or moderating variables are particularly relevant in new media and telecommunication markets. For example, is it likely that due to the time frame of prescription plans, anticipated regret is more likely to occur when buying such services? Another issue is that new media and telecommunication services are services consumed on a media platform where the choice of consumed services occurs after the choice of media platform has been made. Thus, deferred choice and procrastination effects may also occur in these markets. Thus, it is important to know how situational variables, such as time pressure, search/transaction costs, interactions between options of an assortment/complementarity, as

well as individual traits such as maximizing, variety seeking and tendencies to self-blame will mediate and moderate the effects of assortment size and bundling in these markets.?

A final and more decision oriented question, is if and how remedies may be used to affect these mediators and moderators. For example, in many markets, recommendation agents and search services of different kinds are believed to reduce the potentially negative effects of large assortment sizes in general, and in particular for those consumers that are likely to be most subjective to such effects (e.g. the inexperienced media consumer). Providers also use different remedies to reduce the search costs and simplify choice for their customers. For example, branding is suggested to have such effects and may also, consequently, reduce potential adverse effects of large assortment sizes. If so, this represents a positive effect on loyalty that is seldom discussed in regulating authorities' documents of market regulation.

This leads us to the second category of research problems related to assortment variety and bundling, that of regulatory problems. Because most regulatory policies are designed to aim at two different goals, that of ensuring efficient competition and that of stimulating innovation, regulatory authorities manage a set of tools and instruments. Most of these instruments are directed at efficient competition and are applied to wholesale telecommunication services markets. In consumer markets, other means are used to ensure efficient competition. It is, for example, believed that variety is important to ensure that end-users services in consumer markets match consumer preferences. With sufficient variety, preferences are matched and consumers will be more satisfied with their choice of end-user services. (see e.g. <http://www.pts.se/en-gb/About-PTS/Operations/Langsiktig-konsumentnytta/>). To enable preference matching in these consumer markets, consumers must be well informed on the options and their corresponding attributes of services offered. The help consumers in this preference matching task most regulatory authorities offer comparison or recommendation agents or other forms of consumer decision making tools.

Thus, four research problems are related to these aims of regulatory policies. One is if variety is the key to efficient or sustainable competition (regardless of consumer utility). Because this question extends beyond what consumer behavior studies may be used to enlighten, we focus on the three other research questions. The first is if variety implies consumer preference matching and stimulates what the Swedish regulatory authority terms "active choice". As we have seen above, consumer behavior literature suggests two contrasting conclusions on this

issue. One is that it does, the other is that, under a number of moderating conditions, variety seems to reduce consumers tendency to exercise “active choice” and instead avoid choosing or choose to consume less than under low variety assortment choice situations.

The third research problem or question is how the relationship between choice and satisfaction is affected by variety. Parts of the consumer behavior literature suggest preference matching unequivocally implies satisfaction, whereas other parts of the literature suggest a more complex relationship between choice and satisfaction. Satisfaction is also a complex concept, also when discussing telecommunication services. For example, the relationships between consumption and higher order forms of satisfaction are not straight forward for telecommunication and media services like TV-services and online video (Benesch, Frey and Stutzer, 2006).

The final research question is how the comparison and recommendation agent services offered by regulatory authorities to visualize variety and inform consumers affect the relationships between variety and choice and between choice and satisfaction. Generally, such services increase the assortment sizes of telecommunication services and enhance the search attributes of these services rather than their experiential attributes. This is likely to have distinct effects on consumer choice and satisfaction in the short run and on consumer preferences in the long run.

1.2 Approach, method and organization

This report aims to discuss how the assortment literature may be used to analyze the relationship between variety as part of providers’ value proposition and choice and satisfaction. Our approach is to review the consumer behavior literature on variety and bundling with relevance to telecommunication and media services. Furthermore, we discuss how this literature may be applied to understand the effects of variety and bundling/unbundling in individual telecommunication and new media service areas. These service areas differ with respect to service area characteristics in systematic ways giving different conclusions on how “aware” providers of these services should be to potentially positive and negative effects of variety. The differences in characteristics also imply that the implications for regulatory authorities enhancing efficient competition through variety differ

across service areas. Our focus here, however, is more on the provider implications than on regulatory authority implications.

The literature review has been conducted as an open review of consumer behavior literature based on identifying a citation network in the two areas of variety and bundling. Major databases, such as ISI and Ebsco have been used to identify highly cited articles in the consumer behavior literature using the keywords “assortment size”, “assortment variety”, “bundling” and “unbundling” in individual searches. Next, articles citing these much cited articles have been investigated manually to identify two networks of articles that we term the assortment literature and the bundling literature in consumer behavior. Tables 1 in sections 2 and 3, respectively, represent listings of the articles reviewed. In addition, related articles may also have been discussed in the text of sections 2 and 3. Where possible, literature on assortment size and bundling that relate more directly to telecommunication and media services are discussed in section 4.

The rest of the report is organized with a discussion of the assortment literature in section 2 and the bundling literature in section 3. The relevance of this literature to telecommunication and media services is discussed in section 4 with a main focus on provider implications. In section 4, however, some implications for regulatory authorities are also discussed. Finally, in section 5 we conclude and discuss further empirical research based on our findings from this literature review.

2. ASSORTMENT, CHOICE AND SATISFACTION

The economics literature on the product assortment focuses the effects of product variety on consumer choice, preferences and surplus. The general conclusion is that product variety benefits consumers (consumer surplus (Lancaster, 1990)), and that more product variety is preferred by consumers (Kahn and Lehmann, 1991). Both in the literature assuming sequential choice and the literature on hierarchical choice, assortment attributes are of relevance. For example, in hierarchical models of choice, assortment size is valued due to it better capturing the heterogeneity of consumer preferences (Lancaster, 1990). In sequential models with uncertain future preferences, assortment size may be valued when postponing a choice due to greater later flexibility (Simonson, 1990). It has also been argued that assortment size is valued because consumers have an inherent preference for variety (variety seeking) and feeling of decision freedom (self-determination). Thus, assortment size is preferred due to preference fit, increased flexibility and consumers' inherent preference for variety. The literature on consumer surplus also suggests increasing consumer surplus as an effect of product variety (e.g. Brynjolfsson, Hu and Smith, 2003), but consumer surplus effects are not the main focus of this review (see e.g. Guiltinan, 2002).

Marketing literature has often supported the conclusions of beneficial effects of product variety, but more recent research has now started questioning these relationships as universal. Three lines of reasoning may be identified. One line of reasoning suggests that the need for cognition leads to cognitive overload in processing large assortments (e.g. Huffman and Kahn, 1998). Another line of reasoning suggests consumers vary in how developed their preferences are, and that consumers with less well developed preferences are affected negatively by large assortments leading to lower choice probability and further weakening of their preferences (Chernev, 2003; Iyengar and Lepper, 2000). A third line of reasoning suggests that variety may attenuate negative emotions related to choice, in particular, if the choice is between negative options (Amir and Ariely, 2007, see Botti and Iyengar, 2006).

All these three lines of reasoning suggest that product variety adversely affects choice, but choice is a complex concept including the question of choice versus non choice, the formation of preferences, the quality of choice, confidence of choice, and regret, just to mention some of the dimensions of choice. Thus, to state that product variety adversely affects choice, one must also establish which dimensions of choice are affected and how these

effects are moderated and mediated. Our presentation of the relevant literature on assortment-choice relationships is organized first by looking at different independent variables related to assortment size and variety. Next, we turn to the different dependent variables that have been investigated for effects.

The independent and dependent variables may be organized along a choice model. At the left hand side of this choice model are the stages of the assortment, the perception of the assortment and the perception of the choice situation. At the right hand side of this model are the stages of choice, post-choice perceptions of the choice and the experiences with the choice.

Starting with the independent variables, three characteristics of the assortment have been investigated; assortment size, organization of the assortment and assortment variety, which is a special case of organization of the assortment. As another special case of organization of the assortment we find the issue of bundling, which is treated in a separate review in section 3. In addition, a number of moderating and mediating variables have been investigated. We discuss these in relation to the dependent variables.

2.1 Assortment characteristics

Assortment size has been investigated by several authors (e.g. Kahn and Lehmann, 1991 and Botti and Iyengar, 2006), in some studies without paying particular attention to variety of options along particular attributes. The number of options in assortment effect studies are typically manipulated as being small (2-10) or large (10-80) (see Scheibehenne, 2008 for an excellent review). Assortment studies vary from studying simple consumer goods (e.g. jam) to studying services (e.g. restaurants), but most of the studies focus simple consumer goods. Assortment organization includes assortment variety, but focusing other variables related to assortment organization first, variables such as assortment *presentation* (Huffman and Kahn, 1998), assortment *structure* (Hoch, Bradlow and Wansink, 1999) and assortment *categorization* (Chernev, 2005; Gourville and Soman, 2005) have been studied. The literature on assortment size and structure is also related to both the literature on brand extensions and mass customization (e.g. Syam, Krishnamurthy and Hess, 2008), but this is seldom explicitly acknowledged in the literature on assortment – choice relationships.

2.2 Perceptions of the assortment

Variety is sometimes considered equivalent to assortment size, but some studies are more explicit on the fact that assortment size may not necessarily imply assortment variety (Ratner, Kahn and Kahneman, 1999; Oppewal and Koelmeijer, 2005). Acknowledging this fact, some studies focus perceived variety rather than just implicitly assuming that assortment size implies assortment variety (Hoch, Bradlow and Wansink, 1999). Some studies use *perceived variety* as a mediating rather than a traditional independent variable (Mogilner, Rudnik and Iyengar, 2008). As an example, Mogilner, Rudnik and Iyengar (2008) suggest that perceived variety mediates the effect of assortment size on choice, but that the effect of assortment size on perceived variety is moderated by assortment organization and symmetry. The study is one of the few offering an explicit model of the assortment-choice relationship. The lack of explicit models has also been acknowledged by Scheibehenne (2008), suggesting that “*a precise and testable model of the underlying psychological processes and mechanisms would be highly desirable*” (p. 41).

2.3 Perceptions of the choice situation

Studies often take the perception of the choice situation as a choice between options for given, but a choice situation may include more than a choice between options. For example, it may be perceived as possible to reject choosing between traditional options or to *defer* choice and choose between options at a later stage (procrastination) (Ariely, 2008). Issues of deferred choice and procrastination are treated in section 2.4. A few studies, however, have suggested that there may be variables of relevance to the outcome of the choice situation that may stem from the perception of the choice situation itself. For example, consumers may perceive varying degree of enjoyment with the choice situation (Radner et al., 1999). This issue is only briefly discussed in the assortment literature. More attention has been paid to the perception of the degree of *self-determination* and freedom of choice in the choice situation. Mogilner, Rudnick and Iyengar (2008) suggested that the number of categories in an assortment increases perceived variety which affects perceived self-determination and thus, satisfaction with choice. In their study, perceived self-determination was found to explain the negative effects of assortment size on choice and satisfaction. Perceived self-determination may also be related to another characteristic of the perception of the choice situation – anticipated regret. For example, Heitmann, Herrmann and Kaiser (2007) suggested that a

negative effect of variety may be explained by a mediating anticipated regret and high perceived evaluation costs. Thus, it seems plausible that perceptions of the choice in form of perceived effort and the anticipated outcome before the choice is made affect perceptions of the chosen option after the choice has been made.

2.4 Choice

We now shift our focus from traditional independent variables to the dependent variables of the assortment literature. This also means we now focus more directly on the identified relationships between assortment, choice and satisfaction and the proposed mediating and moderating variables of these relationships. As we suggested in section 2.3, choice may involve more than a choice between options.

The most extensively studied issue, however, is that of *choice versus no-choice* (i.e. if consumers choose). As presented in the introduction to section 2 it is usually assumed that the choice probability will at least not be reduced as a consequence of assortment size and variety due to, for example, better match to the heterogeneity of consumer preferences. A number of studies have questioned this assumption. These studies have now been found to have a rather long history (Scheibehenne, 2008), but we will illustrate the typical findings by briefly presenting one of the large number of recent studies questioning this standard assumption. Iyengar and Lepper (2000) report three studies, but only two of these are traditional consumer choice studies, one on consumers' choice of jam and one on their choice of chocolate. The jam study was conducted in a field setting in a store where a large (24 jams) and a small (6 jams) were displayed at a tasting booth. Consumers were given 1\$ off-the-price-coupons when tasting jams. In the jam study, 30% of those tasting jams from the small assortment used their coupons whereas only 3% of those tasting jams from the large assortment did. Thus, the proportion of no-choice was largest in the large assortment group. Similar findings were made in a controlled lab setting with large (30 chocolates) and small (6 chocolates) assortments. Scheibehenne (2008) replicates the jam study as closely as possible, but failed to reproduce the findings of Iyengar and Lepper (2000).

Similar experiences have led most researchers to believe that a general effect of assortment size or variety is difficult to find and that a valid explanation of the negative effect of assortment size or variety and choice should include specific mediating or moderating

variables. Thus, most studies of this relationship include a number of such mediating variables. We have already mentioned the mediating variable of *perceived variety* (Mogilner, Rudnik and Iyengar, 2008; Heitmann, Herrmann and Kaiser, 2007). Heitman, Herrman and Kaiser (2007) further investigated the mediating effect of anticipated product utility, anticipated regret and evaluation costs, and found that of these, *anticipated regret* and *evaluation costs* were the most important mediating variables when explaining the negative effects of assortment size on purchase probability. Investigating hyperchoice situations – situations where assortments reach several thousand options, Brynjolfsson, Hu and Simester (2007) explained the positive consumer surplus effects of hyperchoice by the mediating effect of search costs. Because online stores provide search and recommendation tools, consumers increase their consumption in larger assortment size online stores when compared to offline stores. In addition, Brynjolfsson, Hu and Simester (2007) identify Internet experience as an additional moderator further increasing the effects of search and recommendation tools on consumption.

Instead of focusing only on mediating variables, most recent studies have introduced a number of moderating variables on the relationship between assortment characteristics and choice. Scheibehenne (2008) applies the idea laid out by Simon (1990) that moderated variables in decision making behavior may be found in attributes of the *individual* or in characteristics of the decision *situation*. Both these lines of reasoning have been applied when studying the mediated and moderated effects of assortment on choice.

Of the *situational* characteristics that have been studied are mainly those reflecting other characteristics of the assortment than assortment size. For example, Huffman and Kahn (1998) found that *attribute based presentations* increased choice in large assortments when compared to alternative based presentations. Dhar (1997) found that the tendency to defer choice increased when the options were presented as more *similar*. Using such findings to suggest moderators in the relationship between assortment size and choice, Chernev (2005) found that feature *complementarity* reversed the usually positive impact of the size of the choice set on purchase likelihood. A similar set of findings were made by Gourville and Soman (2005), who found that when option attributes were not *alignable*, the usually positive effect of assortment size on market share was reversed. Thus, to avoid negative effects of assortment size, options should be alignable or non-complementary, and presentations should be attribute based. This corresponds to the findings of studies using

combinations of options and attributes as the basis for moderator studies, such as those using measures of *choice entropy* (van Herpen and Pieters, 2002). Although they apply a rather different approach, Berger, Draganska and Simonson (2007) found that assortments with *compatible* options were perceived to be of a higher quality, and thus preferred more often.

Most of the moderator studies, however, have investigated *individual* characteristics or personality traits as the moderating variables of the effects of assortment size on choice. For example, Chernev (2003a) found that the negative effect of assortment size was moderated by the explicitness of consumer preferences. Thus, consumers with articulated *preferences* were not negatively affected by assortment size in the same way as those with less articulated preferences (Chernev, 2003a, b). Among the individual characteristics or personality traits that has been used are *domain familiarity or expertise* (Mogilner, Rudnik and Iyengar, 2008), *the need for cognition* (NFC) (Lin and Wu, 2006), *individualistic versus collectivistic* culture (Herrmann and Heitmann, 2006), failure to adapt or adjust individual *decision making heuristics* (see Scheibehenne, 2008 for a number of studies), tendency to *variety seeking* (Ratner, Kahn and Kahneman, 1999) and, most of all, the tendency to *maximize* (Schwartz et al., 2002). Of these, the desire to maximize, or what Schwartz et al. (2002) term “maximizing” has been given most focus. We will elaborate on this in section 2.4, but Schwartz et al. (2002) suggest that a new personality concept operationalized by their *maximization scale* is one of the most promising moderators when explaining recent findings in the relationship between assortment variety, choice and satisfaction. Their basic idea is that maximizers tend to seek more variety, engage more in comparisons, and be more sensitive to regret due to self-blame in choices with negative experiences. Also, interactions of situational and individual variables have been used as moderator variables. For example, Chernev (2006) found that future flexibility as a particular *decision focus* leads to overestimating the value of the larger assortments. Thus, the value of large assortments seems to be overestimated in particular when the consumers’ decision focus is that of having flexibility in subsequent choices.

In general, the findings of these moderated studies support the hypothesis that a negative or inverse U-shaped relationship between assortment size and choice is moderated by both *individual and situational factors* and is not a consistently general and stable relationship.

Research has shown that not only the question if consumers choose is influenced by assortment characteristics, but also *what they choose*. For example, a recent study by Sela, Berger and Liu (2009) concluded that larger assortments made consumers choose options that were easier to *justify*. For example, this means that consumers tend to choose options that focus utilitarian attributes rather than hedonic attributes when the assortment size increases.

A third dependent variable category that has been shown to be affected by assortment characteristics and that is closely related to choice is *how much* is chosen/consumed. For example, Kahn and Wansink (2004) found that perceived variety increased consumed quantities through anticipated consumption utility. While not directly related to the assortment characteristics focused here, Vale, Pieters and Zeelenberg (2008) found that for hedonic products that were believed to require self control, small-package assortments increased consumption. This relationship was not found for utilitarian products. Another, more obscure finding is that of Chernev (2008) indicating that consumers that has or are given a specific purchase quantity apply a quantity matching heuristic that makes them more often choose the assortment where the number of options matches the purchase quantity.

2.5 Perceptions of the choice

A choice situation is not only a discrete choice between options where no-choice is one of the options. A choice situation may also be prolonged or include a hierarchical or sequential process where the consumer may also reason over her own behavior at different phases of the process. This has not been given very much attention in the assortment literature, but recent studies have at least started to investigate relevant concepts such as preference or choice stability, choice confidence, repeated choice and the most recent ideas on choice as a tiring process including research on ego depletion in choice. Among these studies is a study of the moderating effects of *preferences* by Chernev (2003b), who also offered the subjects to switch their choice. Thus, Chernev (2003) was not only interested in choice or no-choice, but what he termed the “strength of consumer preferences”. In a fourth experiment in this study, he also included a dependent variable termed “decision confidence” which maps perceptions of the choice. His findings of preferences moderating the too-much-choice effect are consistent across all these dependent variables. Also, Lin and Wu (2006) used propensity to switch as their dependent variables, suggesting that the negative effect of assortment size also is found for the preference for the chosen option.

A line of research that has recently been proposed to be influential to consumer research is that of self-control, ego depletion and choice (e.g. Baumeister et al., 2008; Mick, 2008). Focusing here on the *ego depletion* concept, this research investigates choice in the context of multiple choices. This is a large literature, and we only briefly mention it here due to the concept of ego depletion. With ego depletion it is suggested that choice is depleting and that hyperchoice may attenuate the depleting effects of choice. While this concept can not explain the too-much-choice effects in single choice studies, it may be used to explain similar effects in real life consumer choice settings.

2.6 Experience with the chosen option

Traditional economics literature on choice typically assumes that choices are made to maximize utility, leaving variables such as satisfaction and other perceptions of post-choice experiences of less relevance. In the consumer behavior literature on assortment effects, however, post-choice experiences and perceptions have been given more attention in recent studies. In particular, a considerable number of studies have focused assortment effects of satisfaction, happiness and subjective well being as part of a research stream questioning whether contemporary markets of hyperchoice contributes to increasing well being or not.

In the assortment literature, *regret* is one of the more obvious post-choice variables to study. The variable has been treated as a traditional dependent variable (discussed in Botti and Iyengar, 2006) as well as a mediating and moderating variable in the relationship between choice and satisfaction (Schwartz et al., 2002). For example, Botti and Iyengar (2006) suggested that perceptions of regret are most dysfunctional when choice is associated with negative emotions. It has also been suggested that regret is associated with ease of comparison and likelihood of missed opportunities (see Amir and Ariely, 2002). Thus, assortment size may attenuate comparison and increase the perceived likelihood of missed opportunities. Schwartz et al. (2002) suggested that the tendency to regret is an individual attribute, and found that sensitivity to regret was positively correlated with the tendency to maximize.

Enjoyment was studied by Ratner Kahn and Lehman (1999) who found that individuals choose less-preferred alternatives to increase the variety of what is consumed. Furthermore, they also showed that retrospective global evaluations of enjoyment were greater among those

that consumed a greater variety than among those that consumed only the most-preferred options. The context of this study is music, somewhat limiting its external validity.

Satisfaction is the post choice experience variable most studied in the assortment literature. Both satisfaction with the assortment and satisfaction with the chosen option have been studied. Hoch, Bradlow and Wansink (1999) found that consumers were more satisfied with larger and organized assortments. Also, Chernev (2006) measured assortment satisfaction in his study identifying a moderated effect of decision focus (flexibility seeking) on the relationship between assortment size and satisfaction with the assortment.

Of more relevance here is the effect of assortment characteristics on satisfaction with the chosen options. For example, Huffman and Kahn (1999) found that attribute based presentations of assortments increased satisfaction when choosing from large assortments. Similar findings were made for preference expression. One of the first too-much-choice studies, that of Iyengar and Lepper (2000), also found adverse effects of assortment size on satisfaction (and regret). Botti and McGill (2006) found that when options were more differentiated, choice increased satisfaction with positive and dissatisfaction with negative outcomes. Thus, pre choice variety attenuates post choice experience. The reason, Botti and McGill (2006) suggest, is due to an increasing tendency to self-credit and self-blame when options are more differentiated. Finally, Mogilner, Rudnik and Iyengar (2008) found that assortment categorization influences satisfaction positively. This is what Mogilner, Rudnik and Iyengar (2008) termed the “mere categorization effect”. While the negative effect of assortment size on satisfaction has been replicated in several consumer good domains (e.g. Lenton, Fasolo, and Todd, in Press; Haynes and Olson, 2007), Scheibehenne (2008) was unable to replicate the general effect.

Happiness and satisfaction with life was studied in Schwartz et al (2002), who found that maximization is negatively correlated with happiness and satisfaction. Furthermore, they found that maximizers are less satisfied with their choice than satisfizers. Schwartz et al. (2002) did not, however, manipulate assortment size and variety in these studies.

2.7 Summary table

From the review of the relationship between assortment, choice and experience with the chosen option, we have summarized findings in a table showing the relevant article, the type

of article, the independent and dependent variables and a summary of the study findings. The summary is shown in table 1.

Table 1. Summary of selected assortment studies

| Reference | Type | Independent | Dependent | Findings |
|---------------------------------|----------------------|--|--|---|
| Lancaster, 1990 | Review | Product variety (variants in product group) | Consumer preference Consumer surplus (and other at the firm and market level) | Product variety is preferred by individual consumers Product variety increases consumer surplus |
| Kahn and Lehmann, 1991 | Review and empirical | Number of options Type of options (preference) Variety of options | Value of the assortment (choice) | There is an interaction effect of number, variety and preference on choice. Consumers value assortments, not just individual options across assortments. |
| Dhar, 1997 | Empirical | Choice set size | Choice/No-Choice | Choice set size increase the preference for no-choice. Inferior alternative addition reduces the preference for no-choice. |
| Huffman and Kahn, 1998 | Empirical | Assortment presentation (attribute or alternative) Assortment size Preference expression | Choice Satisfaction | Attribute based presentations increases choice and satisfaction in large assortments. Preference expression increase satisfaction and reduces choice complexity. |
| Hoch, Bradlow and Wansink, 1999 | Model/ empirical | Assortment structure (object attributes, spatial positions) | Perceived variety Assortment satisfaction | Assortment structure affects perceptions of variety and assortment satisfaction |
| Ratner, Kahn and Kahneman, 1999 | Empirical | Variety consumed | Enjoyment | Lower variety increases real time enjoyment but higher variety increases retrospective enjoyment |
| Iyengar and Lepper, 2000 | Empirical | Assortment size | Purchase Satisfaction | Assortment size increases enjoyment of choice, but reduces likelihood of purchase and satisfaction and increases regret. |
| Guiltinan, | Review | Product variety | Choice | Reviews the effects of |

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|-----------------------------------|-----------|--|--|---|
| 2002 | | (general concept) | processes | variety on choice processes and competition. Suggests implications for antitrust law |
| Schwartz et al., 2002 | Empirical | Personality types (maximizer) | Regret Happiness Social comparison | Maximization correlates positively with regret and negatively with happiness. Maximization increases social comparison and regret. Maximization decreases satisfaction when the potential for regret increases. |
| Chernev, 2003a, b | Empirical | Assortment size (number of option) Ideal point availability | Propensity to switch (choice confidence) | Ideal point availability affects the relationship between assortment size and choice confidence positively. |
| Brynjolfsson, Hu and Smith (2003) | Empirical | Product variety | Consumer surplus | Product variety of online book-stores enhances consumer welfare 7-10 times more than lower prices. |
| Kahn and Wansink, 2004 | Empirical | Assortment organization Number of items Consumption rules | Perceived variety Consumption quantities | Organization moderates the effects of variety on consumption quantities |
| Chernev, 2005 | Empirical | Assortment size Complementarity of option features | Probability of choice (attractiveness based) | Feature complementarity reverses the usually positive impact of the size of the choice set on purchase likelihood. |
| Gourville and Soman, 2005 | Empirical | Assortment size Assortment type (alignability of option features) | Market share | Alignability reverses the usually positive effect of assortment size on market share. The effects are caused by need for cognition and anticipation of regret. |
| Oppewal and Koelmeijer, 2005 | Empirical | Assortment size, composition and variety | Assortment evaluation | Assortment size increases assortment evaluation regardless of composition (important attribute) and favorite presence. |
| Botti and Iyengar, 2006 | Review | Choice (number of options) | Choice and non-choice | Suggests need for cognition, lack of preferences and |

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|--------------------------------------|-----------|---|---|---|
| | | | Confidence Regret | emotional conflict to be determinants of adverse choice effects. Suggests policy implications. |
| Lin and Wu, 2006 | Empirical | Assortment size Recommendation Need for cognition | Propensity to switch (choice confidence) | Need for cognition and availability of recommendations moderate the effect of assortment size on propensity to switch (positively) |
| Chernev, 2006 | Empirical | Assortment size Decision focus (flexibility or choice) | Assortment choice Satisfaction with the assortment | Decision focus moderates the relationship between assortment size and assortment choice/satisfaction (flexibility leads to overestimating the value of the larger assortment) |
| Herrmann and Heitmann, 2006 | Review | Culture (individualistic versus collectivistic) | Variety perception Variety seeking | Individualistic cultures prefer variety and seek variety. Variety cost and regret differences are under-researched |
| Botti and McGill, 2006 | Empirical | Option differentiation Choice/no-choice Self-credit/blame | Satisfaction | When options are more differentiated, choice enhances satisfaction with positive and dissatisfaction with negative outcomes. For less differentiated options there is no difference between choosers and nonchoosers. |
| Heitmann, Herrmann and Kaiser, 2007 | Empirical | Product utility Anticipated regret Evaluation costs Perceived assortment variety | Purchase probability | Inverted U-shape relationship between variety and purchase. Negative effect of variety operates via anticipated regret and evaluation costs Positive effect of variety operates via anticipated utility. |
| Berger, Draganska and Simonson, 2007 | Empirical | Assortment size Assortment type | Perceived quality Choice Perceived expertise | Positive effects of assortment size on choice are mediated by perceived quality and expertise. Assortment type (compatibility) moderates the effect positively |

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|------------------------------------|-----------|---|---|---|
| Mogilner, Rudnik and Iyengar, 2008 | Empirical | Assortment categorization Domain familiarity | Perceived variety Choice satisfaction Self determination | Number of categories increases perceived variety and thus perceived self-determination and thus satisfaction with choice regardless of categorization basis. This effect moderates the negative effects of assortment size on choice and satisfaction |
| Chernev, 2008 | Empirical | Assortment size | Purchase | Quantity matching heuristic leads consumers to buy the assortment that matches the number of the “to-be-purchased” items. |
| Scheibehenne, 2008 | Empirical | Assortment size Moderators / mediators: Option complexity, option size difference, attractiveness, cultural differences, personality traits | Choice proportion Satisfaction Regret Willingness to pay | Could not replicate previous negative effects of assortment size. Could not replicate with either mediators or moderators either Suggest more moderators |

3. BUNDLING, CHOICE AND SATISFACTION

In addition to assortment size and variety, bundling of the assortment influences consumers in different ways. In this chapter we will look deeper into how bundle characteristics influence consumers, how consumers perceive various types of bundles in various choice situations, and how bundle characteristics may also influence consumers' post purchase evaluations. The review presented here is limited to articles published after 1989. Although some of the articles presented here do not necessarily fit very well into the six stage process used as a structure for this report's chapters 2 and 3, the articles are organized by and presented in the stage we find most relevant.

3.1 Bundle characteristics

Bundles are offered both as *pure and mixed bundles*. Pure bundling is when “only a bundle of items or components is available for purchase” (Herrmann, Huber and Coulter, 1997, p. 99) while mixed bundling “gives buyers the option of purchasing either the bundle, or any of all of the individual components” (Herrmann, Huber and Coulter, 1997, p. 99). The results from the study of Herrmann, Huber and Coulter (1997), conducted in an automobile and automobile service context, indicate that consumers prefer pure bundles to mixed bundles – preference measured as purchase intention.

The effect of the *number of items bundled* is another bundle characteristic studied. In a study by Herrmann, Huber and Coulter (1997), purchase intentions among consumers were revealed to be higher for five component bundles than for three and seven component bundles. Estelami (1999) found a positive correlation between the number of items in complementary bundles and consumer savings for fast food bundles and photo equipment bundles (but no such correlation was found for personal computer bundles). Thus, the relationship between numbers of items bundled and purchase intention/consumer saving range from an inverted U relationship via a positive relationship to a non existing relationship.

Furthermore, effects of the *complementarity of the products in a bundle* have been studied. Complementary bundles refer to bundles where the items in the bundles are functionally related while non-complementary bundles are bundles where the items are not functionally related (Estelami, 1999). It was revealed by Harlam et al (1995) that consumers had a higher

purchase intention for bundles consisting of complementary items than for bundles with unrelated items. This is also supported by Herrman, Huber and Coulter (1997) who found that very related bundle items in automobile bundles and automobile service bundles resulted in a higher purchase intention than bundles of moderately or not related items.

Items information (or amount of information about the items or products in a bundle) differs a lot between bundles, and we have found one study that has looked into how item information may influence consumers' perception of the bundle. Studying purchase of a beach holiday, Oppewal and Holyoake (2004) found that consumers would rather purchase single items than bundles when they had more information about the items.

Several studies are conducted on effects of *price information* and *price discount information*. A rather intuitive results was revealed by Herrman, Huber and Coulter (1997), finding that greater price discounts of bundles were preferred to a lesser one. This is further supported by Janiszewski and Cunha jr (2004) who found that respondents "preferred the bundle with the discount on the tie-in product more when the discounted price was 100% of the market price as opposed to 50% of the market price" (p.538). In their study, Janiszewski and Cunha jr (2004) also found that consumers are more sensitive to discounts on the less important and less valued item compared to the most important and most valued item in a bundle. However, the value of the discount given is found to depend on consumers' reference price. This is also revealed by Charavarti et al (2002) who found that when the price of the focal product in a bundle is higher relative to the comparison option, evaluation of the bundle will be more negative and choice proportion lower. In a study of an automobile offer, Johnson, Herrmann and Bauer (1999) found that satisfaction with the offer, likelihood of recommending, and likelihood of repurchase increased when price information was bundled and when information on price discount was debundled. Harlam et al (1995) hypothesized that bundles consisting of items of similar price level would increase purchase intention compared to bundles consisting of dissimilar price level, but did not find support for this hypothesis. They did, however, find support for the prediction that consumers are more sensitive to increases in bundle prices than to decreases in bundle prices.

Bundle presentation format, or framing, refers to different ways of describing a bundle (Harlam et al, 1995). In their study, Harlam et al (1995) found that framing a bundle as "Buy X and Y together at Z\$" contributed to a higher level of purchase intention than framing the

bundle as “Buy X for A\$ and Y for B\$” and “Buy X for Z\$ and get Y for free”. Also, Gilbride, Guiltinan and Urbany (2008) revealed support for what they call a joint integrated model (“Pay \$X when you buy both product A and product B”) compared to a joint segregated model (“Pay \$Y for A and \$Z for B when you buy both”) and a leader segregated model (“Pay \$W for B when you buy A at the regular price”). Results from a study by Chakravarti et al (2002) contrasted this result. They found that a bundle of a refrigerator was perceived as most desirable and had a higher choice proportion when the price of the bundle was presented partitioned. However, the evaluation and choice of the bundle depended on which items that were partitioned. When a consumption-related item (icemaker) was partitioned, evaluation of the bundle was more positive than when a performance-related item (warranty) was partitioned. The authors’ theoretical explanation for this is that consumers focus was directed to the additional consumption value when the icemaker was partitioned while their attention was directed to the possible risks of product failure when the performance related item was partitioned. In a study by Yadav and Monroe (1993), three different frames of bundle offers were presented. 1)The savings presented as the difference between the rebated component prices and the price of the bundle – 20\$ savings, 2)the savings presented as the difference between the original price of the components and the rebated price of the components – 20\$ savings – in addition to the difference between the rebated component prices and the price of the bundle – 20\$ savings (which means a total saving of 40\$), and 3)the difference between the original price of the components and the price of the bundle – 40\$ saving. The study found reasonable support for frame 2, that saving is perceived as a combination of the rebate on the components and the rebate of the bundle compared to the rebated price of the components. Sheng, Bao and Pan (2007) stressed the importance of *perceived fairness of the surcharge* when partitioning a bundle price. In their article they use surcharge as the denotation for the price of the tie-in product and base price as the denotation for the focal product. Their results show that when the surcharge is relatively low compared to the base price, partitioned pricing generates a higher level of purchase intention compared to an equivalent bundled price. They also found that consumers perceived low surcharges as more fair, and that this perceived fairness increased purchase intention. So when the surcharge is perceived as fair, partitioned pricing generates higher purchase intentions than an equivalent bundled price.

3.2 Perception of the bundle

Sarin, Seago and Chanvarasuth (2003) developed a theoretical framework for how to bundle a new high-tech product with an existing technology. One of their main proposals is that an existing technology can help reduce *perceived risk* of the new technology. They argue that risk reduction can be attained successfully if one of the two products in the bundle has a *brand name that is perceived as credible*, or preferably, if both of the two products in the bundle have credible brand names. In particular, it is important to introduce the new high-tech product together with a product with a credible brand name in a bundle if the level of innovation of the new high-tech product is radical. They also argue that the level of perceived risk related to purchasing the new high-tech product will be lower if the new product is included as a tie-in product in the bundle compared to when it is introduced as the focal product (anchor product) in the bundle. Finally, they relate the perception of risk to discount, and their main hypothesis is that perceived risk will be lower when the new product bundle is offered with a discount than when it is offered without any discount. The importance of *perceived risk* is further investigated by Harris and Blair (1999; 2006) who found that perceived compatibility-risk when purchasing single hi-fi components increased the chance of purchasing a hi-fi bundle (a home theater package). This result was particularly significant when consumers uncertainty regarding information about alternatives and about which alternatives to choose was high. In a study of cereal bars, Harris (1997) found that “for a new product that is not a brand extension of an established product, promotional bundling with the established product can increase perceptions of product quality and decrease perception of risk among buyers of the established product”. The opposite effect was revealed for a new product that is a brand extension. The effects were only significant among respondents that were already buyers of the established product.

Consumers’ *perception of the value of each of the items* in the bundle influences their valuation of the bundle (Leszczyc, Pracejus and Shen, 2008). They underline the importance of the interaction effect between consumers’ perception of the value of the items and their *certainty of the item evaluation* on the valuation of the bundle. The authors discriminate between what they call superadditivity; “where the value of the bundle is greater than the sum of its parts” (Leszczyc, Pracejus and Shen, 2008, p. 235) and subadditivity; “where the value of the bundle is less than the sum of its parts” (Leszczyc, Pracejus and Shen, 2008, p. 235). An example of subadditivity is when the two items in a bundle are partly substitutes, as for

example in a bundle of a snowboard and a pair of skis. Leszczyc, Pracejus and Shen (2008) argue for the possibilities of hyper-subadditivity and superadditivity. Both situations are, according to the authors, a function of consumers' certainty about the items in a bundle and their perception of the value of the items in the bundle. Their point is that the value of the certain item is often used to infer the value of the uncertain item. If the value of the certain item is low, this can lead to a low valuation of an objectively high value item in the bundle because of consumers' uncertainty about this item. Thus, the valuation of the bundle will be very low – hyper-subadditivity. On the contrary, if consumers are certain about the value of the objectively high value item, their valuation of the low value and high uncertainty item will be inflated, leading to a very high valuation of the bundle – superadditivity. This effect is revealed by Leszczyc, Pracejus and Shen (2008) even without complementarity between the two items studied.

Results from Gaeth et al (1990) indicate that the evaluation of the core product and the add-on product in a bundle is averaged or balanced to form an overall rating of the bundle. In their study they found that the *quality* differences between three quality categories of a VCR and a typewriter was evaluated to be higher when consumers evaluated the two products alone than when they were evaluated together with a tie-in product (tape was a tie-in product for the VCR and calculator was the tie-in product for the typewriter). Furthermore, they found that “attributes of the tie-in product had a much larger effect on the evaluations of product bundles than would be expected on the basis of their monetary worth alone” (Gaeth et al, 1990, p. 47). They also compared the relative advantage of bundling as a marketing strategy to pure cash rebates and found that bundling was the most effective strategy, in particular when the bundle included a high-quality tie-in product.

Based on prospect theory, Kaicker et al (1995) investigated effects of *discrepancies between expected prices and real prices* on consumers' preferences for purchasing products as a bundle or separately. Five scenarios were tested. 1) Multiple gains – when both X and Y had a positive value, consumers preferred to purchase the two components individually because the value function for gains is concave ($\text{value}(X) + \text{value}(Y) > \text{Value}(X+Y)$). 2) Mixed gains – when the value of X is positive and the value of Y is negative (and $X > Y$) consumer preferred to purchase the two components as a bundle (because “the loss function is steeper than the gain function, $\text{value}(X) + \text{value}(-Y)$ is less than the $\text{value}(X-Y)$ ”) (Kaicker et al, 1995, p. 232). 3) Mixed losses/Low net loss – This means that the gain on one outcome is slightly

less than the loss on the other outcome, and consumers prefer to purchase the products as a bundle (because $\text{value}(X) < \text{value}(X-Y) - \text{value}(-Y)$). 4) Mixed losses/High net loss – This means that the gain on one outcome is much less than the loss on the other outcome, and consumers prefer to purchase the products individually (because $\text{value}(X) > \text{value}(X-Y) - \text{value}(-Y)$). The explanation for this is that “segregation allows the consumer to feel better about a relatively large loss by also considering a small gain (Kaicker et al, 1995, p. 232). 5) Multiple losses - when both X and Y had a negative value, consumers preferred to purchase the two components as a bundle because the value function for loss is convex ($\text{value}(-X) + \text{value}(-Y) < \text{value}(-(X+Y))$). The five scenarios presented above represent the authors’ hypotheses, and they revealed support for all of the hypotheses with an exception for the Multiple loss hypothesis.

Heeler and Adam (2004) studied perception of bundle prices, and revealed that consumers presented with a bundle perceive that the price of similar unbundled components are 10,2 percent higher than the bundled price. However, when consumers were informed that the price of the bundled and the unbundled components were equal, they actually evaluated the unbundled alternative more positively than the bundled one.

While most of the existing research has focused on bundles of products distributed in similar forms (or sold through the same channel), Koukova, Kannan and Ratchford (2008) look at product form bundles, meaning that a product is distributed through two or more channels. They propose that, for example, a book distributed in a traditional physical format and an electronic format often are perceived as substitutes and that consumers, therefore, often buy the book in only one of the two formats. They point to the importance of emphasizing the relative advantage of the two formats to increase the attractiveness of a bundle offering the product in both formats. The two formats may have relative advantages in different usage situations. For example, a physical book may be the best alternative for ordinary reading while the online format will probably be better for locating specific parts or sequences of the book. In their study they found support for their ideas – that the manipulation of different usage situations increased consumers’ intention to purchase a bundle of both a physical book and an electronic version of the book (given that the second item is discounted).

3.3 Perception of the choice situation

In addition to characteristic of the bundle and consumers perceptions of the bundle, consumers' perception of the choice situation may also influence their evaluation and behavior to bundling. Oppewal and Holyoake (2004) proposed that purchasing a beach holiday in a shopping centre (*retail agglomeration*) would reduce the chance of purchasing a bundle (because it was easy for the consumers to shop around for the components among several travel agencies located in the shopping centre). However, they actually found that consumers are more likely to purchase bundles if there are many competitors nearby. Furthermore, they revealed that situational factors as *time pressure* increased the chance of purchasing bundles. Finally, they also found that *purchasing with a partner* increased the chance that components were purchased while consumers preferred bundles while purchasing alone on behalf of a group. Simonin and Ruth (1995) looked into effects of *prior attitudes* toward the components in a bundle of dental care products and found that consumers prior attitude towards components' brands influenced the evaluation of the bundle positively. Harris and Blair (2006) found support for the hypothesis that preferences for a bundle of stereo components are more positive when bundle choice reduces search efforts. The effect is particularly significant among consumers who are less motivated to process information. Consequently, situational factors as *motivation to search for information* and *motivation to process available information* influence preferences for bundles.

3.4 Choice

Drumwright (1992) found some support for the hypothesis that consumers will purchase more with bundling than they would if the products were offered individually. For situations with mixed bundling, she found some support for economic theory, predicting that consumers only will purchase bundles with positive consumer surplus. For pure bundling, she found some support for what she calls behavioral theory – “*bundles create contexts that prompt consumers to cancel losses against gains*” (Drumwright, 1992, p. 314). Her explanation is that consumers in specific contexts may use noncompensatory decision rules like conjunctive, disjunctive or lexicographic decision rules.

In an article by Foubert and Gijsbrechts (2007), effects on choice of bundles of similar products are studied. This means special offers like “Pick 2, get \$.50 off” or “Buy one, get one for free” (Foubert and Gijsbrechts, 2007, p. 648). They found that “When a consumer's

total purchase quantity in the category equals or exceeds the bundle quantity requirement, the bundle discount has a positive impact on a bundle item's choice probability" (Foubert and Gijsbrechts, 2007, p. 648). However, they also found that even in situations where consumer's purchase quantity is lower than the quantity requirement, the bundled still has a positive impact on choice. They explain this through a "discount communication effect" (Foubert and Gijsbrechts, 2007, p. 649), meaning that the promotion for the bundle of products increase the sale of the product also on an individual basis. When it comes to quantity requirement, the authors report that there is a critical point for the quantity requirement, meaning that an increase in the quantity requirement has a positive effect on choice up to a critical point. Above this critical point the effect of increasing the quantity requirement has a negative impact on choice.

3.5 Experience with the chosen option

An interesting study by Soman and Gourville (2001) looked into differences in *actual usage* of a service when the service was purchased as a bundle and when it was purchased as individual items. Their study showed that consumers purchasing a bundled four day ski pass rather than four one day ski tickets, used the skiing facilities to a lesser degree the fourth day than consumers purchasing four individual tickets. Their explanation for this is *transaction decoupling* – decreasing consumers' attention to sunk costs. In a situation of scarce resources, this result indicates that overbooking through bundling can be safe because all of the consumers who have purchased a ticket will not show up if the tickets are sold as a bundle.

In a study of a service bundle at a health and fitness resort, Naylor and Frank (2001) found that first-time guests to the resort who expected that the package price would cover most of their expenses, but discovered after they arrived that this did not happen, reported lower *perception of value* than guests whose expectations were met. Customers, it appears, would rather pay more for an all-inclusive package than deal with separate charges. This remains the case, even when customers would save money by paying for services separately, outside the bundle (Naylor and Frank, 2001, p. 280). The study underlines the importance of meeting consumers' expectations of both monetary costs and hassle costs to attain high valuation of a bundle. Mankila (2004) proposed effects of bundling bank services on intention to stay with the bank. In a student sample, she hardly found any such effects, indicating that bundles do not strengthen consumers' *loyalty or retention*.

In a theoretical paper, Bodily and Mohammed (2006) discuss impacts of music *genre* and *usage occasion* for music as important antecedent for how to bundle an offer to get satisfied consumers. They pinpoint that consumers preferring various types of music should be considered as different segments and that different tie-ins should be prioritized for different genres. For example, among consumers preferring modern rap, sampling of new related music may be a suitable tie-in while consumers preferring classic rock may rather prefer historic information about old bands as a tie-in. Bundles may also be constructed based on usage situations. Consumers may differ in their preferences for music depending on whether they are exercising, driving their car, or relaxing after an exam.

Finally, a study by Chong, Hentschel and Saavedra (2007) shows that consumers who received two or more offerings of public services increased their consumption more than consumers receiving public services one and one. The authors interpret the finding as a positive effect of bundling public services on consumers' welfare. Estalami (1999) found that consumers savings from purchasing complementary bundles ranged from -18 percent to 57 percent with an average saving of 8 percent.

3.6 Summary table

From the review of the relationship between bundling, choice and experience with the chosen option, we have summarized findings in a table showing the relevant article, the type of article, the independent and dependent variables and a summary of the study findings. The summary is shown in table 2.

Table 2. Summary of selected bundling studies

| Reference | Type | Independ. | Dependent | Findings |
|--|-----------|-----------------------|--------------------------|---|
| Gaeth, Levin, Chakraborty and Levin (1990) | Empirical | Multi-product bundles | Usefulness, quality, WTP | -Evaluations of primary product and tie-in product are balanced when evaluating product bundles -Attributes of tie-in product had larger effect on evaluation of product bundles than expected -Product bundling compares favorably with cash rebate, especially when bundle is enhanced by a high-quality tie-in product |
| Drumwright (1992) | Empirical | Bundling of car | Choice Purchase | Bundling influence choice and some support for increased purchasing was |

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|--|-----------|--|--|---|
| | | extra equipment | | also revealed |
| Yadav and Monroe (1993) | Empirical | Perception of bundle savings. Perceived saving on individual items if purchased separately. Perceived additional savings on the bundle | Transaction value | Results indicate that additional savings offered directly on the bundle have a greater relative impact on buyer's perceptions of transactional value than savings offered on the bundle's individual items. The effect of each saving is also influenced by the magnitude of the other saving |
| Salinger (1995) | Model | Bundling (Pure bundling) | Profitability Welfare (consumer surplus) | Bundling and charging a price equal to the sum of the components' prices lowers consumer surplus. Bundling can, however, increase consumer surplus when it results in lower prices |
| Kaicker, Bearden and Manning (1995) | Empirical | The role of selling price deviations from price expectations | Preference for choice | Multiple gains: consumers prefer component pricing Mixed gains: Consumers prefer bundle pricing Mixed losses (net loss low): Consumers prefer bundle pricing Mixed losses (net loss high): Consumers prefer component pricing Multiple losses: Consumers prefer component pricing (contradictory to hypothesis) |
| Simonin and Ruth (1995) | Empirical | Product combination Form of bundle Attitudes to the brand(s) | Evaluation of the bundle | Prior attitudes toward the components brands significantly affect the evaluation of the bundle. No significant effects revealed for -Product combination or -Form of the bundle |
| Harlam, Krishna, Lehmann and Mela (1995) | Empirical | Bundle type, Price framing, and Familiarity | Purchase intention for the bundle | -Bundles of complements have a higher purchase intention than bundles of unrelated products -Consumers are more sensitive to a bundle price increase than to a bundle price decrease of equal amounts -Different presentation formats for describing the price of the bundle influence purchase intention -More familiar subjects respond to |

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| | | | | different presentations of equivalent bundles in different ways than less familiar subjects |
| Herrmann, Huber and Coulter (1997) | Empirical | Pure or mixed bundle, Bundle price discount, Functional complementarity, Number of components | Intention to purchase | Pure bundles are preferred to mixed bundles A greater price discount is preferred to a lesser one 5 component bundles generated greater purchase intention than either 3 or 7 component bundles Very related bundle components result in greater purchase intention than either moderately or not related components All of the results were relatively consistent across product and service |
| Harris (1997) | Empirical | Promotional bundling | Evaluation of: Product quality Risk of purchase. | For a new product that is not a brand extension of an established product, promotional bundling with the established product can increase perception of product quality and decrease perception of risk among the buyers of the established product For a new product that is a brand extension effects were revealed in the opposite directions |
| Estelami (1999) | Empirical | Product bundles | Consumer savings | On average consumers save about 8 % by purchasing bundles. Consumer savings in complementary bundles range from 57% to -18%. |
| Harris and Blair (1999) | Empirical | Functional risk Uncertainty | Preference for product bundles | Choice of a bundle was higher for subjects in the risk manipulation condition than in the no risk condition and higher in the high uncertainty condition than in the low uncertainty condition. |
| Johnson, Herrmann and Bauer (1999) | Empirical | Price information bundling Discount information bundling | Satisfaction Likelihood of recommending Likelihood of repurchase | Evaluations (all three dependent variable) increase when price information is bundled and when discount information is debundled |
| Naylor and Frank | Empirical | Product bundling | Perceived customer | First time guests to the resort who expected that the package price would |

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| (2001) | | (full service health and fitness resort) Pure versus mixed bundling | value | cover most of their expenses, but discovered after they arrived that this did not happen, reported lower perceptions of value than guests whose expectations were met. Customers will rather pay more for an all inclusive package than deal with separate charges. |
| Soman and Gourville (2001) | Empirical | Price bundling | Decision to consume | Price bundling leads to a disassociation of transaction costs and benefits, thereby reducing a consumer's likelihood of consuming a paid-for service |
| Chakravarti, Krish, Paul and Srivastava (2002) | Empirical | Partitioned presentation of multi-component bundle price | 1.Evaluation 2.Choice 3.Underlying processing effects | -Evaluations of a product bundle will be more positive and choice proportions higher when its price is presented in partitioned versus consolidated fashion -Evaluations and choice proportions of a product bundle with partitioned prices depend on the component that is partitioned. Components are consumption-related accessory versus performance-related feature *The influence of positive versus negative framing on evaluation and choice will be greater when the warranty price is partitioned relative to when the icemaker price (<i>not the focal product</i>) is partitioned or when the bundle price is consolidated |
| Sarin, Sego and Chanvarasuth (2003) | Theoretical (Propositions are developed) | Bundle characteristics (high-tech product): 1)Bundle versus components, 2)Brand credibility, 3)product innovation 4)discount | Perceived risk | All else being equal,.... -perceived risk is lower when bundled compared to offered as an individual product -consumers' perceived risk associated with the purchase of a new product will be lower when product(s) in the bundle has credible brand name(s), -the positive relationship between innovation level and perceived risk will be weaker when the new product in the bundle has a more credible brand name -consumers' perceived risk associated with the purchase of a new product will be lower when the new product bundle is offered with a discount |

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| Oppewal and Holyoake (2004) | Empirical | Bundling Retail agglomeration | Shopping behavior | <p>-Consumers are more inclined to buy individual components when they have more information about these components.</p> <p>-Consumers are more likely to either not purchase at all or purchase a bundle if there are more competitors nearby (retail agglomeration)</p> <p>-Experience reduces purchase of bundled packages.</p> <p>-Also some effects of a)Time pressure and b)Shopping companion</p> |
| Janiszewski and Cunha Jr (2004) | Empirical | Price discount framing | Evaluation of product bundle | <p>Consumers subjectively value individual products in a bundle and then sum these values to arrive at an overall evaluation of the bundle</p> <p>When price discounts are assigned to an individual product in a bundle, the value of these discounts are referent dependent</p> |
| Mankila (2004) | Empirical | Price bundling | Retention | Bundles had hardly any effect on the intentions to stay with the bank |
| Heeler and Adam (2004) | Empirical | Price bundling | Inferred transaction value | <p>-Respondents presented with a bundle believes that an equivalent unbundled offer would have been 10,2 percent more expensive.</p> <p>-When respondents were informed that the price of an equivalent unbundled offer is the same, evaluation of the bundled drops to a level lower than the unbundled offer</p> <p>-Respondents believed that a bundle is 20,6 percent cheaper than the unbundled offer and that the semi-bundled purchase is 4,4 percent cheaper than the unbundled offer</p> |
| Bodily and Mohammed (2006) | Theoretical | Genre and Usage occasion (Music) | Satisfaction | <p>Various music genres are preferred in various segments and they have to be bundled differently to satisfy consumers in different segments.</p> <p>Bundles must be designed based on knowledge about usage occasion.</p> |
| Harris and Blair (2006) | Empirical | 1.Search costs | Preference for product bundles | Preference for a bundle is greater when bundle choice will reduce search effort than when it will not, particularly among consumers who are less motivated to process information |
| Chong, | Empirical | Bundling | Household | A positive effect of bundling of basic |

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| Hentschel and Saavedra (2007) | | of basic public services | welfare in develop-ing countries (Peru) | public services is found on household welfare in developing countries |
| Foubert and Gijsbrechts (2007) | Model/ Empirical | Bundle promoti- ons | Purchase effects | Promotional bundles are more effective at inducing switching than boosting category sales. The strong switching effects result from two mechanisms; 1)Stockkeeping units that are part of a bundle promotion appear to reinforce each other's choice probability, and 2)the bundle discount tends to attract consumers even if they do not buy enough to qualify for the price reduction |
| Sheng, Bao and Pan (2007) | Empirical | Type of pricing (Bundle price or base price and surcharge. Perceived fairness of surcharge) | Purchase intention | When the surcharge is relatively low compared to the base price, partitioned pricing generates higher purchase intentions than an equivalent bundled price, and vice versa The greater the surcharge magnitude in a partitioned pricing, the lower is the perceived fairness of the surcharge and purchase intention When the surcharge is perceived as fair, partitioned pricing generates higher purchase intentions than an equivalent bundled price, and vice versa |
| Koukova, Kannan and Ratchford (2008) | Empirical | Product form bundling (print vs. electronic) | Purchase intention | Awareness of product form advantages in different usage situations increase purchase intention for both forms As long as the second item is discounted bundling increase purchase intention |
| Gilbride, Gultinan and Urbany (2008) | Empirical/ Model | Framing in mixed price bundling | Choice | A joint integrated framing results in a significant increase in the probability that consumers choose the bundle. |
| Hamilton and Koukova (2008) | Empirical | Option bundling Supplier bundling motives | Option importance Option choice | Options offered both individually and in bundles are perceived as more important and chosen more often than when offered only individually |
| Leszczyc, Pracejus and Shen (2008) | Empirical | High versus low value items. | Bundle valuation | Bundling a low-value certain item with a high-value uncertain item, which are not substitutes, results in a bundle valuation lower than the value |

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| | | Certain versus uncertain items | | of the uncertain item alone Bundling a high-value certain item with a low value uncertain item lead to superadditivity, even though the items are not complements When two objects are bundled, and one has a more certain value, decision makers use the value of the certain item to infer the value of the uncertain item |
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4. VARIETY AND BUNDLING IN NEW TELECOMMUNICATION AND MEDIA SERVICES

As explained in section 1, our inspiration to write this paper came from our experience with testing consumer reactions to value proposition variety as well as to incorporating variety as part of the value proposition. Our findings that consumers had difficulties interpreting and valuing variety as part of the value proposition made us question the assumptions behind many of the value propositions and regulatory policies in new telecommunication and media services.

Variety is important in both 1)value propositions and 2)regulatory policies in telecommunication and new media services. For example, a large research project in heterogeneous networks with participants representing eight of the larger telecommunications operators in Europe, suggest that: *“...any user will be able to connect to “any” network...many different networks may be available, and the end user would have the freedom to select one or more of the alternatives”* (Ho, Markendahl and Berg, 2006, p. 1). Implicit in this value proposition is the traditional assumptions of economics literature that variety benefits consumers’ choice, utility and surplus. As we have seen from our review, this assumption has recently been questioned in the consumer behavior literature.

Also, variety is believed to be important to efficient competition in several telecommunication service markets. Because SMP (Significant Market Power) regulation focuses wholesale market regulation rather than end-user markets, regulatory authorities in Norway use other instruments to facilitate competition in consumer markets. One such instrument is the web site telepriser.no which is designed to enable consumer comparisons of mobile telephony, fixed telephony and broadband service provider offers. This comparison takes the form of a recommendation agent (RA). For mobile telephony, telepriser.no provides a comparison of 82 offers (when accessed in December, 2008) described by option attributes focusing pricing. Based on the review of the effects of variety on choice and satisfaction and that consumers use telepriser.no, it is likely that choice and satisfaction are influenced. A major question, however, is how choice and satisfaction are affected.

The review has revealed effects of bundling and various bundle characteristics on purchase intention mainly, but also on choice. Effects on other dependent variables are studied only in a few studies. A large number of independent variables (bundle characteristics – some of

them in interaction with consumer characteristics and characteristics of context) have been studied, but in relation to various dependent variables. Some of the results are contradicting, making it difficult to draw any clear conclusions. In the perspective focused in our review, excluding articles on bundling from economic journals, none of the contributions use telecom services as their context of study. Studies on effects related to experience with the chosen option are more or less absent in the literature reviewed. Consequently, there seems to be a need for research on effects of bundle characteristics for telecom- and media services, in particular studies of post purchase effects like satisfaction, loyalty, and relationship between consumers and the suppliers of bundles.

In the following, we will discuss the relevance of the assortment and bundling literature with reference to and examples from six different service areas in new telecommunication and media services. The six service areas are 1) traditional telephony and broadband services, 2) mobile Internet services and applications, 3) services in heterogeneous access networks, 4) multi play services, 5) TV-channel network services and 6) online video services. Not all service areas are discussed in all sections. Instead, particular attention is paid to service areas where particular findings have significant implications.

As seen from the brief introduction above, variety may be part of providers' value proposition in telecommunication and new media services. Some value propositions may also implicitly assume that variety is handled by consumers and that it creates customer value. Finally, an understanding of consumers' perceptions of variety and its influence on choice and satisfaction is also important in designing differentiating value propositions in these markets. Although none of the articles reviewed on bundling are conducted on telecom- or media services, the review clearly indicate that bundling in general can create consumer value. Bundling represents a user friendly way of purchasing, often including a rebated price for consumers. But this value differs across user segments and usage situations. Consequently, effective use of bundling depends upon an understanding of consumer segments' preferences and influences of usage context.

4.1 Variety

Traditional telephony and broadband services are well established homogeneous network services where there is fierce competition on standardized services. Providers mainly

differentiate through pricing plans and simple quality variables like speed or bundled minutes. Assortments are represented by bundle packages in the telephony market and by variations in price/speed packages in the broadband market. Looking at mobile telephony in the Norwegian market, plan assortments vary from 1 plan (Lebara) to 14 plans (Telenor and Netcom). Adding that these plans are typically compared in RA's like *telepriser.no*, it is likely that at least for Telenor and Netcom, the assortment size is close to the size suggested to lead to too-much-choice effects. Service providers should consequently organize their assortments by categorization, provide presentation of option attributes for comparison rather than option comparisons, and directing their assortments carefully at segments, particularly those with a tendency to seek variety and maximize (the most price sensitive). It is a dilemma that the consumers most likely to be characterized by the maximizing trait are those using the RA's that present the largest assortment sizes for these services. This makes it important for providers to monitor the use of RA's, and consider reducing assortment variety if the number of consumers using the RA's when considering switching provider becomes large.

What could be considered the best mobile Internet services and applications business models have been discussed in a number of scientific and professional articles (e.g. Henten et al., 2004; Ballon, 2004; Methlie and Pedersen, 2007; Godø and Hansen, 2009). Many of these articles typically contrast a closed model with a smaller assortment of quality controlled services offered and an open model with a large assortment of services of varying quality. The latest example so far is the difference between the Apple App Store and the open Android Market, at least when it comes to what the providers have announced on their business models. When looking at the assortment size in many of these services and applications, they come closer to hyperchoice assortment sizes than to the assortment sizes investigated in too-much-choice studies. Thus, an open question remains if there are other mechanisms of consumer behavior in hyperchoice assortments than in regular assortments. Findings by Brynjolfsson, Hu and Smith (2003) and the more conceptual ideas of Andersson (2006) suggest that this is the case. So far, it is difficult to apply the findings from the assortment literature to hyperchoice value propositions, suggesting much more research is needed on this. Differences in search cost are the most important explanatory factor of consumer surplus from long tails (Brynjolfsson, Hu and Siemester, 2007). However, tools to handle the search costs of hyperchoice are not readily available for mobile Internet services and applications. It may also be possible that assortment organization tools and consumer attributes like

experience and expertise are moderating factors that play an important role in hyperchoice. This has been suggested by John Strand using online bookstores as an example. He suggests that it is due to the long education of people in reading and book-segmentation that we are able to cope with hyperchoice in online bookstores. Strand contrasts this with the mobile applications market suggesting that: *“An App Store can be compared to a bookshop. The mobile industry does not lack booksellers, it lacks the people that can educate users and teach them how to use mobile phones for other things than just voice and SMS. We need to educate the many billions of illiterate mobile users, rather than focusing on building bookshops”* (Strand, 2009).

Peer-based recommendation systems does not require large screens, and the findings of Brynjolfsson, Hu and Simester (2007) that Internet experience moderates the effect of hyperchoice, is something that can be used to segment markets and apply assortment versions for mobile Internet services and applications as well. Currently most consumers using such services are highly experienced, and to prepare for more regular consumers and to handle too-much-choice effects for these consumers, assortment structure findings and findings on regret and satisfaction may be applied to this service area.

Heterogeneous access networks is a third service area where the assortment literature is relevant. The assortment literature indicates further limitations in the rationality of consumers as well as fully rational mechanisms that influence the perceptions of satisfaction. Above we showed how a particular value proposition in heterogeneous network services placed heavy burdens on the rationality of consumers as agents. The assortment literature suggests that the choices made when applying the value proposition of ambient networks would be far from optimal when evaluated by consumer utility or consumer surplus. In addition, findings on post choice experiences indicate that consumer satisfaction is likely to suffer from this value proposition, regardless of the quality or usefulness of the proposition itself. Furthermore, findings in the literature on ego depletion suggest that decision quality may suffer even more than that resulting from assortment variety. Instead, value propositions in heterogeneous access networks should, if applying assortment literature findings, be based on principles similar to existing roaming agreements. That said, there are obvious advantages of leaving more of the composition of these agreements to be personalized by the consumer, but at the time of the handover, consumer choice and satisfaction are not improved by involving a situation of repeated, high variety assortment confrontation.

The question of variety versus quality is also relevant in the discussion of open access networks versus bundled offerings in triple or multi play services. The situation is similar to that discussed for mobile Internet application markets. Currently, the offerings in most open access network portals are rather limited. For example, the number of services offered in the Swedish Mälarenergi Stadsnät is 34 Internet services, 9 telephony services, 17 TV services and 27 other services. In addition, 22 bundled services are also offered (<http://www.malarenergi.se/sv/privat/stadsnat/>). This is far from a hyperchoice situation, but the assortment size is well above that resulting in negative choice and satisfaction effects identified in the assortment literature. Currently, all assortment presentations are organized by service attributes such as bandwidth, price, bundled minutes etc. This simplifies assortment perceptions, but it would be interesting to study choice and satisfaction effects of this assortment size in open access network services. We are currently conducting an experiment in this area using assortment sizes similar to that of Mälarenergi Stadsnät.

Another related service area that is currently much discussed is bundling versus “a la carte” pricing/choice of TV channels (Rennhoff and Sefres, 2008; Crawford and Cullen, 2007). While the main conclusions of studies applying microeconomic models to this area some years ago were that bundling was viable, both with respect to consumer and provider surplus, and thus to welfare, recent studies suggest that there are negative welfare effects of TV channel bundling. Crawford and Yurukoglu (2009) conclude that: *“in the short run, welfare will increase for many consumers under à la carte regulations, while industry profits will decrease, substantially so for content providers”* (p. 31). None of these studies, however, consider potential choice effects of assortment size and organization as a consequence of “a la carte” choice situations. In general, “a la carte” choice situations will increase assortment size and reduce the dimensionality of assortment categorizations leading to negative choice effects. While it is difficult to predict how this could affect the demand models applied in microeconomic “a la carte” models, it is likely that they would contribute further to the “less consumed” predictions of the demand side findings of these models. The potential short term effects on satisfaction, and the longer term effects on satisfaction resulting from changes in TV-channel consumption, are even more difficult to predict from the assortment size literature.

While assortments are not in the hyperchoice range for TV services, this is certainly so in the online video market. A lot of providers currently offer a variety of on demand online video

content (see examples in section 4.2) and the variety is even greater in sites offering user generated content, such as Youtube.com. Starting with the first category, the iTunes Store may be used as an example. It currently offers thousands of movies and episodes from TV-shows. It also offers educational video content through iTunes U. It is difficult to identify exactly how many are offered and the iTunes Store applies extensive categorization as well as recommendation and search engines to manage the large assortment and provide it without negative choice effects to their audience. One may hypothesize that the combination of expertise, categorization, and search and recommendation tools makes consumers cope with hyperchoice. This seems likely to be the case in true hyperchoice situations in online video content like Youtube.com. Little is known, however, of how the tools that makes consumers cope with these volumes affect consumer choice and satisfaction in the long run. It has been argued that consumers cope with hyperchoice that results in increased revenues for providers of hyperchoice due to sales in long tails (Brynjolfsson, Hu and Siemester, 2006). The picture, however, may be more nuanced. For example, Elberse (2009) suggests that in the music industry, mixed bundling reduces music industry revenue. She finds that *“the demand for individual songs is growing at a faster rate than the demand for albums is declining, the dollar amounts gained through new song sales remain far below the level needed to offset the revenues lost due to lower albums”*. (Elberse, 2009, p. 36). In another study of video content, she found that online hyperchoice actually increased the sales of the most sold titles, rather than reducing them as suggested by “long tail theory” (Elberse, 2008). In addition, she found that the long tail didn’t get fatter as suggested by “long tail theory” (2006), but thinner and longer. Consequently, there may be size effects in hyperchoice as well, but it is likely that these effects are even more moderated by factors such as expertise and assortment organization.

To summarize, assortment literature suggest that there are negative effects of assortment size on choice and satisfaction. While telecommunication and media services have not been focused in these studies, some of these services are currently developing into interesting application areas for this literature. Providers should carefully investigate how assortment effects influence the value perceptions of value propositions, particularly if variety and “freedom of choice” are fundamental to the value proposition. Besides short term effects of assortment size and variety on choice and satisfaction, it is also likely that long term effects will occur as value propositions also influence consumer preferences over time.

Regulatory issues

As mentioned above, SMP regulation is directed at wholesale markets and not consumer markets. While the main concern of regulatory policies is to stimulate competition in such markets and as a consequence variety and preference matching in consumer markets, regulatory policy documents also stress the importance of stimulating innovation. We will not bring up the debate of the relationship between competition and innovation here, but instead focus on the consequences of the assortment literature on competition in consumer markets.

Assortment literature indirectly suggests that there may be an optimal assortment size and/or variety. If this is empirically correct, competition should be stimulated to reach this level of optimal competition from a consumer perspective. At the same time, assortment literature raises a number of questions limiting its direct applicability from a regulatory perspective. First, assortment size perceptions and choice effects are moderated by consumer traits. For example, some consumers may be variety seeking and experienced enough to handle larger assortments. In fact, larger assortments may raise expectation levels beyond what is possibly fulfilled for these consumers. Another group of consumers may be variety avoiding due to lack of competence in a particular service area. As suggested by assortment literature these may avoid seeking high variety choice situations or avoid choice when brought into such situations.

The other issue is that optimal variety, as we have seen in the section above, is suggested to differ considerable across service areas. This is partly due to consumer experience and consumer involvement. For example, mobile service plans are likely to be considered a search service whereas online video services and TV-services are much more experiential services. This suggests involvement is much higher in the latter service categories implying that optimal variety is found for a much larger assortment for these latter service categories. Thus, there is an interaction between service area characteristics and consumer characteristics that make optimal variety vary by service areas and consumers. The result is that regulatory policies should be adapted to segments of service/market constellations and not universally to each service market. This is naturally rather difficult in practice.

Another issue is that optimal variety when seen from the perspective of stimulating competition also varies across services due to characteristics of the services themselves. For

example, some services lend themselves more easily to categorization and organization, for example by service attributes or options than other. This is particularly true of services which may be described along a fairly objective set of service attributes. Examples are mobile services plans, multi play services and simple broadband services like Internet access. Categorization and assortment organization is much more challenging for services that are only described along a set of experiential service attributes.

As also mentioned above, most regulatory authorities have decided to stimulate competition in consumer markets by offerings RA-services. In the Nordic countries, Norwegian, Swedish and Danish regulatory authorities run RA-services under sites named telepriser.no, telepriskollen.se and teleguide under the domain it-borger.dk, respectively. Other regulatory authorities have decided to let providers of comparisons sites and RA's run similar services, but that these services should be authorized by the regulatory authorities (e.g. Ofcom in the UK). The basic idea behind offering RA-services is that the assortment presented to consumers reflects all offerings in each consumer market. As a consequence, consumers are offered a larger assortment, sometimes reflecting greater variety. The RA-services are believed to stimulate consumers to change their service providers to offerings that better reflect their individual preferences. This is believed to have positive welfare effects. For example, the Swedish PTS states: *“PTS ska i sitt arbete alltid utgå från vad som är bäst för konsumenterna. I idealsituationen är det konsumentens aktiva val som styr marknaden. För att det ska kunna ske måste konsumenterna ha tillgång till ett brett utbud av tjänster och god information om vad marknaden erbjuder”* (<http://www.pts.se/sv/OmPTS/Verksamhet/Langsiktig-konsumentnytta/>). As we have seen from the assortment literature, this relationship has been questioned suggesting that RA's may both increase and reduce the consumers' to choose. Regulatory authorities should thus be familiar with the assortment literature to adapt their RA-services to fit each service category and reflect differences in consumer characteristics.

It is also likely that regulatory authorities implicitly assume that there is a simple relationship between variety, preference matching, choice and satisfaction. Also, the last of these relationships have been questioned by the assortment literature. For example, variety seekers or maximizers are believed to benefit from greater assortment size when it comes to the tendency to choose. However, large assortments may raise expectations among maximizers to levels that may not be fulfilled. Currently, we know little about how RA-services affect

satisfaction with the chosen options (see e.g. Xiao and Benbasat, 2007). More research on this issue is required, and regulatory authorities' RA-services offer great opportunities for further research on the relationship between both assortment size and choice as well as between choice and satisfaction under RA-services support.

4.2 Bundling

Competition is tough in the market of traditional mobile services, and the providers are offering rather standardized services to consumers. Traditional mobile telephony is usually not part of triple play or multi play bundling. One exception is Altibox, who has started to include traditional mobile services in their multi play bundle. This is clearly a differentiation from their competitors in the market of triple play/multi play, potentially increasing purchase intention (Harlam et al, 1995) and consumer savings (Estelami, 1999) on telecom services. Besides the usually lower price of bundled services, consumers often also value the ease of having one bill and one company to be in touch with rather than to coordinate and handle several companies – often with somewhat varying service standards and procedures. Results presented by Herrman, Huber and Coulter (1997) indicate that there may be a boundary value for the number of service in a bundle, making it important for suppliers to consider carefully the additional consumer value of adding one more service to a bundle. The more typical bundling within traditional mobile telephony is subscriptions typically bundling services such as voice and sms/mms. The bundles vary according to number of free mms and sms during a month, free minutes for voice services nationally and internationally, free minutes with friends who are customers of the same operator, etc. Typically, consumers have to pay a flat fee in addition to variable costs on voice and sms/mms services (when passing the threshold level for free minutes and number of sms/mms). The thing here is that consumers have to find the bundle (subscription) that suits them best based on how they are using mobile services. Recommendation agents based on personal information about consumers use of mobile services (number of mms/sms pr month, information about international calls) may be helpful to find the best service bundle (subscription) for mobile telephony consumers. In addition, consumers have to consider potential advantages – like for example risk reduction (Sarin, Sego and Chanvarasuth, 2003) - of purchasing a mobile service bundle (subscription) within a multi play bundle. Although not allowed in all countries, handset bundling is used in most markets. Tallberg et al (2007) classifies handset bundling into 1) Vendor handset, where the

devices are sold through retailers independent of operators (no bundling). 2) Co-branded handset. The level of operator control depends on the relative negotiating power between the operator and the handset manufacturer. Operators services are typically more integrated in the handset interface than in vendor handset, and 3) Operator handset, where the operator typically buys the handset from the manufacturer (pure bundling) – for example as in Japan with NTT DoCoMo and KDDI (Tallberg et al, 2007).

As mentioned in chapter 4.1.1, mobile services can also be purchased individually (not in a bundled subscription). One example of an open marketplace for purchasing mobile services individually is the Android market. However, there are various possibilities for purchasing mobile services individually (open model) or bundled (closed model). A service like Easypark can be purchased individually from Easypark at www.easypark.no in an open model. Although the service is also available at Telenor (mobile services), Easypark is mainly selling their service through www.easypark.no. Another service is Travelalert by Aidcom. This service can be purchased at www.aidcom.no. The service offers alerts for possible disasters like earthquake, terrorism, etc. Besides being offered individually, the service has also been bundled with travel insurance services at TrygVesta. When consumers purchased travel insurance at TrygVesta, Travelalert was included in this service. A similar service to Travelalert is the iSafe service offered at Android market. As can be seen, new mobile services can be purchased individually from service providers, they can be bundled with complementary services, and they can be offered on an individual basis at marketplaces like Android market. New mobile services like the Travelalert service will typically have an advantage of being bundled with a strong brand name as TrygVesta (Sarin, Sego and Chanvarasuth, 2003; Harris, 1997). However, some of the results from the bundling literature indicate that the tie-in product in a bundle (which will be the Travelalert services in the bundle with TrygVesta) has a relatively large impact on the bundle evaluation (Gaeth et al (1990). This may prevent more well-known companies or brands to bundle new mobile service as a part of their main activity. What is also interesting is to see whether new mobile services will be included in subscription bundles offered by telecom operators. For consumers with an already existing relationship with an operator, this may add value to the relationship.

Heterogeneous (access) networks add a lot of risk to a service. A study conducted by Pedersen, Methlie and Nysveen (2008) shows that some operators are careful by introducing new services in heterogeneous network because of the complexity. First of all, the actor

responsible for bundling services in heterogeneous networks needs to have a clear service level agreement with other involved actors. And there are many actors involved, and it is complex to develop unambiguous service level agreements. Furthermore, there is an extra risk related to the inclusion of a number of (new) services in a bundle that are unknown to the market. The consumers have a relationship with the actor bundling the services in heterogeneous networks. There are potentially a lot of problems that may appear (both related to heterogeneous access network and new services) leading to a low service level for consumers. Typically, the consumers will attribute these problems to the actor to which they have their relationship - the actor bundling the services in heterogeneous networks. Consequently, this actor is potentially exposed to a relatively high market risk. This may hinder initiatives of bundling in heterogeneous networks. However, given all the actors involved in heterogeneous networks and the many actors offering individual services in such networks, the complexity for consumers will be enormous, and difficult to handle for most people. An actor succeeding with a consumer friendly bundle with a stable service level in heterogeneous networks should have a huge potential for success.

Today, access to multi play services is not open. Access is limited to the multi play service provided by the network- or cable operator consumers subscribe to. The service is open in the sense that consumers can switch between operators, but given a subscription to for example Canal Digital or Telenor the consumer cannot get access to for example the Altibox multi play service. Open access means that a service as for example Altibox will be available for all consumers. The realization of real open access therefore means that the network and cable providers have to compete on service quality and brand strength. Results from research on bundling shows that brands matter for consumers' evaluation of bundles (Sarin, Sejo and Chanvarasuth, 2003; Harris, 1997). In the Norwegian market, Altibox is the only multi play brand. This multi play service is only available from a few operators in Norway today. Building the Altibox brand may be a huge advantage for the owners of Altibox if open access is realized for multi play providers and Altibox can be available for consumers with cable or fiber subscriptions to all operators.

Consumers typically purchase packages of TV channels as bundles offered by their cable operator. In addition, most consumers have the possibility to purchase extra channels if they like – mixed bundling. When purchasing a channel bundle, consumers often get access to channels that they do not prefer – and, therefore, do not watch. These channels do not add

value to the consumer. For many consumers “a la carte” pricing is a more efficient way of purchasing channels. There are also websites offering many channels for free – like www.craftytv.com, www.channelchooser.com and www.invision.tv. The competition increases and traditional tv channel providers have to adapt to consumer preferences. Many factor may influence consumers preferences. The amount of information correlates positively with purchase of individual components (Oppewal and Holyoake, 2004), indicating that consumers who holds a lot of information about different channels are more inclined to go for an “a la carte” menu rather than for a bundle of channels. It is consequently rather surprising that the only TV-provider in Norway currently offering “a la carte” choice is the one with the smallest assortment and the most inexperienced customers – Riks-TV. Channel complementarity is also important for bundle preferences (Harlam, et al, 1995), and the degree of complementarity of channels in a bundle is important to make the bundle as attractive as possible. If many of the channels in a bundle are substitutes, an “a la carte” menu appears relatively more attractive. Decisions about TV channels are typically conducted in a family context, and decision process for such group decisions differ significantly from individual decisions. Providers of TV channels have to understand these decision processes to adapt their offerings to all kind of decision processes and segments. Motivation to search for- and process information is also a potential factor influencing the choice between bundles and “a la carte” purchase (Harris and Blair, 2006). Consequently, there are many factors related to individual consumers and context that has to be considered when offering TV channels in the market. The fact that TV channels can be watched through more and more media also makes it important for the providers to explain the relative advantage of access to the channels in the different media (Koukova, Kannan and Ratchford, 2008). For example, consumers may want access to TV in traditional TV media for HD quality while they prefer access to TV channels in computers (through the internet) because of the possibilities for access anytime and anywhere. An understanding of the relative advantages of access to TV channels through the various media may increase the chance of selling access to TV channels through many media – media bundle. Although “a la carte” for channels are discussed today as an alternative for bundles of channels, we will probably see an “a la carte” for programs in the future where consumers will have the possibility to purchase programs, movies, etc. without any lock ins to specific channels.

This brings us over to online video services. A lot of companies have started to offer online video. Examples of companies are Amazon, Blockbuster, Cinema Now, Vudu, Netflix, Hulu (only available in the USA), Joost, and Sfilmy. For most of these companies, their video on demand service is offered together with the other products in their online store. Amazon, for example, presents their video on demand service together with the other products and services they are offering. However, it does not look like Amazon is bundling their video on demand service together with other services they offer. We can see that they are offering TV season specials, meaning they are offering consumers the possibility to watch all of the season's episodes of a TV series for a somewhat rebated price (meaning they are bundling the episodes for a season). CinemaNow and most of the other companies mentioned above are also offering film rental together with sale of DVDs, but there do not seem to be any bundling of the two services. Joost seem to have a type of bundling with Facebook – called Facebook connect. This makes it possible to log in to Joost with your Facebook ID and find Facebook friends who are already at Joost. Vudu seem to have a similar service linked to both Facebook and Twitter. We may look at this as services bundled to the movie service with a potential to increase consumers' value of the film service.

Regulatory issues

As discussed earlier in this report, bundling can be used, or misused, to influence competition in a market. This again may influence the variety of services, and thus, consumers' value perception. Based on potential threats to market ineffectiveness in various industries, government authorities typically implement various types of regulations.

One of the main regulations in the context of traditional mobile services is to allow all operators to use parts of the incumbents' infrastructural facilities. While the regulation guarantees access for all operators on the one side, it also guarantees the incumbent a fair price for the other operators' usage of its infrastructure. This is typically done through call termination fees, meaning that a call originated from A (and A's operator) to B (and B's operator, which differ from A's operator) has to pay a termination fee to B's operator. This implicitly means that B's operator has a monopoly on termination of calls to B. This monopoly situation may lead to sub-optimal termination fees and is therefore regulated. In Norway, the termination fees for Telenor and NetCom are regulated. The larger market players are often in a position where they can offer many services, for example through

handset bundling. As a result of their relative negotiating power, the larger operators are in the position to get handset tailored to their specifications from handset manufacturer. The larger operators also typically integrate vertically to a large extent, giving them a strong competitive position in the market they operate (Tallberg et al, 2007). The Norwegian Post and Telecommunication authority has conducted an assessment of the effect of bundling mobile handset and subscriptions on diffusion of new technologies (the study was conducted by Copenhagen Economics). The results indicate that handset bundling stimulates diffusion of new technologies, but the results are weak, and strong conclusions are not stated (www.copenhageneconomics.com). Regarding open or closed business models for new mobile services, the concept of business models include a service strategy, definition of governance form, and a revenue model (Methlie and Pedersen, 2007). In a regulatory perspective, the service strategy has to include services that are legitimate and not against the laws in the countries it is offered. Because regulations and laws vary across countries, service strategies may have to be adapted when launched in different countries. The price level is part of the revenue model, and prices can be regulated. For example, access to emergency numbers is for free. Regulation may also influence the governance form. It is important that actors do not become too large, reducing the competition in a market. Regulations to reduce the chance of “monopolistic like” market conditions may therefore be implemented.

According to Wireless World Research Forum (WWRE) (<http://www.networkworld.com/news/2007/052107-special-focus-4g.html?page=2>), 4G will be a collection of technologies and protocols, not just one single standard. That's similar to 3G, which today includes many technologies such as GSM and CDMA that meet specific criteria. To help move the standards process along, WWRE - whose members include Ericsson, Huawei Technologies and Motorola - contributes to standards work done within groups such as the International Telecommunications Union (ITU), the group that defined 3G wireless specifications, and the IETF. According to Shahid Ahmed (<https://microsite.accenture.com/ServiceInnovation/Research/Pages/4GBlog.aspx>), the wild card in all this 4G speculation is government regulation. The regulatory environment can act either as a catalyst or as an inhibitor for telcos leaping across the chasm toward 4G. The ensuing 700 MHz debate is just heating up and it is going to make a huge impact to our wireless industry. From a spectrum perspective, his view is that the technology has moved on from the rules and regulations that were built 50 years ago or so. So the idea of segmenting

and segregating spectrum for specific applications is old school thinking and needs to be changed. The technologies available today let companies use any band and any part of the spectrum that is available. Ahmed admits that opening up the spectrum to any applications supporting any device is a great start, but why stop there? Certainly, we have to preserve some part of the spectrum for emergency and law enforcement use. But WiFi has already shown that we can all get along hopping from one part of the spectrum to another. If we open up the spectrum just as we have opened up the Internet, we will see a lot more innovation all over the world, he claims¹. Finally, the European Commission argues for a need for standardization to ensure interoperability and coexistence. The regulation should be technology independent (European Commission, 2008, p. 14).

Today we have a situation where the distributor who has built an access network has the exclusive right for distribution through this network. This means that the consumers are locked to this specific distributor for example when considering purchasing multi-play services. Although this distributor may offer various combination of multi play services (and providers), the competition is restricted both as a result of the bundling (multi play is a pre-specified package of services) and as a result of the closed network (meaning that there are other offers “out there” that the consumer do not have access to). By opening the access network, consumers will get access to all available offers from all available providers, increasing consumers’ freedom of choice. However, a potential downside by opening the access networks is that the increased competition created by open access networks may lead to reduction in motivation and ability for the distributors to build and upgrade access networks, thus, reducing the quality of the access networks over time (Forbrukerrådet, 23.01.2009).

There is a discussion going on right now about whether TV distributors should be imposed to offer a la carte pricing – give consumer the possibility to purchase all channels one by one rather than in bundles. A la carte pricing will give consumers the possibility to pay for only the channels that they want to watch while bundling typically means that consumers pay for a package consisting of both channels that they want to watch and channels that they do not

¹ This text is more or less a citation from Shahid Ahmed, found at <https://microsite.accenture.com/ServiceInnovation/Research/Pages/4GBlog.aspx> [accessed October 6, 2009].

want to watch. Arguments in the discussion is typically that a la carte pricing will increase the price of single channels, but probably reduce the total price for TV-channels the consumer purchase (because the consumer do not need to pay for channels that she do not want to watch). However, the downside is that the marginal channels available today typically will disappear because so few people are buying them, leading to a reduced number of channels available – reduced variety and freedom of choice. Packaging, or bundling, of TV channels may also reduce the competition among the TV distributors because bundling makes it easier for the distributors to differentiate their products, thus reducing price competition. An alternative is mixed bundling, meaning that bundling is allowed but that some channels should be available for individual purchase. In Norway, the Norwegian Media Authority do not recommend regulation of this market.

TV programs are typically produced by a production company and then sold to a TV channel company. In this sale, all program rights, denoted as a bundle of rights, are typically transferred to the TV channel company. “Norsk Film- og TV produsenters forening” fight for an unbundling of these rights so that for example sale of DVDs and accessories can be kept by the producers. Their view is presented in a consultative statement to the new EU TV directive. They suggest that rules should be established to prevent bundling of rights and that rights to TV productions should be unbundled into a line of rights that can be divided between the involved parts, mainly the producers and the TV channels (Giske, 2007).

5. CONCLUSIONS AND DISCUSSION

In this working paper we have reviewed the literature on the effects of variety and bundling on choice and satisfaction and applied it to telecommunication and new media services. Potential effects of regulatory issues on choice and satisfaction are also briefly discussed.

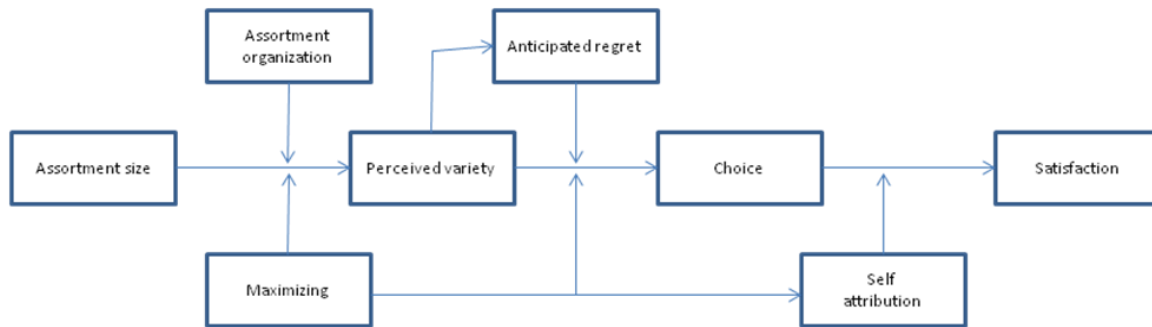
5.1 Conclusions

Review of the literature shows that a number of *assortment characteristics* are studied. Assortment variety, presentation, structure and categorization are typical assortment characteristics studied while characteristics as size, complementarity, price and framing often are focused in studies of bundles. Focusing the *perception of assortment and bundle*, perceived variety of the assortment seem to be among the few variables. Perceived credibility, perceived value of bundle items, and perceived price seem to be the most studied variables related to the perception of a bundle. While procrastination and self-determination represent variables from the assortment literature related to the *perception of a choice situation*, literature on bundling have a focus on situational variables as time pressure, purchasing alone or together in a group, and motivation to search for- and process information as variables influencing consumers perception of the choice situation. A lot of studies are published on *choice* in the assortment literature. The most widely studied issue is that of choice versus no-choice. The research presents several implicit models explaining antecedents of choice/no choice, and many of these models include both mediating and moderating variables. We can conclude that the literature is rather well developed on this issue in the assortment literature. Fewer studies are found explaining choice versus non-choice in the bundling literature. Studies on *perception of choice* seem to be missing in the literature on bundling while some studies from the assortment literature have investigated concepts as choice confidence, repeated choice, and ego-depletion in choice. Finally, assortment literature on *experience with the chosen option* has looked into regret, enjoyment and satisfaction as post-choice effects while the bundling literature have focused similar constructs, such as actual usage, perception of value, and loyalty and retention. Although the volume of assortment- and bundling studies in the six stages used to organize the literature in sections 2 and 3 varies, many of the studies reveal that choice and value perception (measured in various ways) depends on individual and situational characteristics. Consequently, effects of assortment and bundling do not seem to be universal.

5.2 Research implications

Based on the assortment- and bundling literature reported in this working paper, none of the articles has studied effects of assortment and bundling on choice and satisfaction for new telecommunication and media services. The review also reveals several other choice and post-choice variables that may be influenced by assortment characteristics as for example regret, welfare, value, self-depletion (particularly relevant in hyperchoice context), and decision quality. Also, the review shows that many potential variables (as for example user experience, user expertise, maximizing, and assortment organization) have a mediating or moderating influence on the effect of assortment characteristics on choice and post-choice related variables. As a result of hyperchoice context, search tools, etc., (typically relevant for new telecommunication and media services) that change the traditional assortment conditions as perceived by consumers, there is a need to investigate more deeply how assortment characteristics as size, variety and bundling influence consumers' choice and post-choice evaluations, and to understand the process for how assortment characteristics and bundling influence these dependent variables under various conditions.

As a continuation of the review presented here, an empirical follow up study to learn more about the effects of assortment characteristics on choice and post-choice evaluations has been designed. For the purpose of generalization of results, the study will be conducted on two services; multiplayer and TV channels. When studying effects of a phenomenon, a typical approach is to manipulate the phenomenon and to control for potential individual and situational influences. In the study, effects of assortment characteristics such as assortment size, price, and subscription length will be studied. In addition, individual characteristics such as user experience and/or expertise and tendency for maximizing and situational characteristics as for example assortment organization (bundled versus free assortment) will be included as potential moderating and mediating influences. Although several other variables are also considered for inclusion in the empirical study, a model draft is illustrated in the model below.



The model illustrates the effects of assortment size on satisfaction with choice, mediated by perceived variety and actual choice. The model also illustrates potential moderating influence of assortment organization on the effect of assortment size on the perception of assortment variety, in addition to effects of other potential moderating variables. Other relationships than the ones included in the model may also be investigated – for example, assortment organization may also have a direct effect on perceived variety. Although this model is very preliminary, it represents a starting point for our future work on empirical studies of the topics discussed in this working paper.

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