SNF-REPORT NO. 22/03

Using mobile services to strengthen brand relationships: The effects of SMS and MMS channel additions on brand knowledge, satisfaction, loyalty and main channel use

by

Herbjørn Nysveen
Per E. Pedersen
Helge Thorbjørnsen

INSTITUTE FOR RESEARCH IN ECONOMICS AND BUSINESS ADMINISTRATION
BERGEN, JULY 2003

PREFACE

Grimstad and Bergen, July 2003

Herbjørn Nysveen   Per E. Pedersen   Helge Thorbjørnsen

CONTENTS

ABSTRACT

The purpose of the research reported here is to study effects of SMS and MMS as channel additions on customers' relationships with a brand. Theoretically, the research is based on an extended version of the Relationship Investment Model proposed by Rusbult (1980). The extended Rusbult (1980) model includes variables measuring the strength of a brand relation such as brand knowledge, brand satisfaction, quality of alternative brands, direct relationship investments and indirect relationship investments, as a function of SMS/MMS as channel additions. In addition, the effects of adding SMS/MMS channels on the actual use of the brand's main channel are studied. The variables in the extended Rusbult model are proposed to mediate the effects of SMS/MMS as channel additions on main channel use. A review of research on mobile services, with particular focus on SMS and MMS services is presented as a basis for the research. Also, a brief discussion of channel addition as complements, supplements and substitutes of the brands main channel is included.

Empirical studies are reported for three brands which have added SMS and MMS as brand channel additions. The first brand, FINN is provider of the largest newspaper and Internet classifieds service in Norway. The second brand, TV2 is Norway's largest commercial TV broadcasting company. It also presents services such as news, weather forecasts, entertainment and sport on the Internet. Big Brother, the third brand, is a reality show presented by the Norwegian broadcasting company TV-Norge, through 24 hour cable and broadband subscriptions channels and on the Internet.

The main results of the studies may be summarized as follows.

* SMS seems to have a more positive effect than MMS both on the variables included in the extended Rusbult (1980) model and on main channel use.

* The effects of SMS/MMS as channel additions are more positive on direct relationship investments and indirect relationship investments than on the other variables in the extended Rusbult model.

The effects of the variables in the extended Rusbult model on main channel use were also studied. Direct relationship investment is revealed to be the main driver of main channel use. As reported above, SMS/MMS as channel additions were found to influence direct relationship investments positively. Thus, the effects of SMS/MMS on main channel use seem to be mediated mainly by direct relationship investments. Direct relationship investments reflect 1) time spent with the brand, 2) emotional relationship with the brand, and 3) the importance of the brand in customers everyday life. Thus, brands should strive to offer SMS/MMS services that increase customers' time spent with the brand, services that strengthen the emotional relationship between the customers and the brand, and services that make the brand an important part of customers everyday life.

1 INTRODUCTION

The unique economics of e-commerce makes customer loyalty and brand relationships more important than ever (Reichheld and Schefter, 2000; Thorbjørnsen, Supphellen, Nysveen, and Pedersen, 2002). To attain competitive advantage, companies should strive to build strong brands and strong brand relationships online. In the past few years, several new online services have been made available through mobile channels, and wireless services have been proposed to be an important channel for marketing, advertising, and brand relationships in the future (Newell and Newell Lemon, 2001; Balasubramanian, Peterson, and Jarvenpaa, 2002; Watson, Pitt, Berthon, and Zinkhan, 2002). In general, little is known about how mobile devices and -services may be used effectively for building brand equity (Balasubramanian, Peterson, and Jarvenpaa, 2002). However, researchers and industry players alike appear to be unanimous in their assessment of how crucial it will be to obtain consumers` permission before using mobile devices as vehicles for communication and distribution between a brand and its customer (Lot21, 2001; Barwise and Strong, 2002). Currently, mobile devices have several limitations compared to other interactive media in terms of interface richness, speed of download, lack of standardization, etc. Thus, the medium will often lack the ability to deliver the *complete* range of services and messages from brands. Therefore, mobile devices should be used as a channel additions rather than stand-alone channels. "*Wireless communication should never be a stand-alone channel of communication*" (Lot21, 2001, p. 6). Integration with other traditional channels seems to be the key for the success of mobile commerce. *The purpose of this report is, therefore, to propose effects on consumer-brand relationships of adding mobile channel services such as SMS and MMS to the existing channels used by a brand.*

SMS (short message service) is a facility for sending short text messages between cell phones (King, Lee, Warkenting and Chung, 2002). SMS is available on GSM networks and allows text messages to be sent and received by mobile phones via the network operators or from SMS gateways on the Internet (Lai, 2002). MMS (multimedia messaging service) is the next generation of wireless messaging that will be able to deliver rich media messages (King, Lee, Warkenting and Chung, 2002). Rich media messages include pictures, voice, graphics and video. Through utilizing SMS- and MMS- messaging, brands are now able to interactively communicate with their customers and clients regardless of time and place. However, due to the present limitations in screen size and capacity of mobile phones, marketing communication through such wireless devices has to be quite brief, to the point, and informative - yet the message should also provide content of personal interest and value to the recipient. Consequently, the line between mobile advertisements/mobile marketing and informational content will become blurred (Lot21, 2001). The dialogue between the brand and the customer will most likely be based on value-added services and services additions rather than pure advertisements.

In this report, we first discuss three possible strategies when adding a new channel. Second, to predict the effects of adding SMS and MMS services on brand equity and brand relationships, it is necessary to pinpoint some of the unique characteristics of SMS/MMS-services and discuss how these unique characteristics may help strengthen consumer-brand relationships. We therefore present and discuss literature on the unique characteristics of wireless or mobile devices and -services. Third, a theoretical model of brand relationships is presented, and propositions regarding the effects of SMS and MMS on consumer-brand relationships are set forth. Next, a description of the methodology used to test the propositions and the results of three studies are

presented. Finally, some conclusions are drawn, and implications of these are discussed.

2 CHANNEL ADDITIONS

In an increasingly competitive environment, a competitive weapon used by more and more companies, is to add new channels to exisiting ones (Geysken, Gielens, and Dekimpe, 2002). Milgrom and Roberts (1990) showed that when modern technology is available, the optimal strategy of a company is to increase all relevant business efforts instead of only a subset of them. The situation today is that we have numerous but often separated, online services (Geng, Huang and Whinston, 2003). Barua, Whinston and Ying (2001) argue that companies should make synergistic investments. By doing this, the value of complementarity among related services will be better exploited. Often it is the customers who themselves have to integrate related services to exploit the complementarity among service offerings. For example, a customer buying a vacation may have to visit a travel agency web site to search for information about available flights, hotels, etc. For information about the destination, the customer may have to visit the website of for example Frommers to get access to a detailed description of the destinations sights and attractions. Then he/she has to visit another website to reserve a car for the vacation[1]. It may also be the case that the customer is not comfortable with doing transactions online. Consequently, he/she may want to order and pay for the vacation by the use of a telephone. To increase the competitiveness of a company, the company itself should strive to integrate *complementary* services and distribute these services in complementary channels. According to Milgrom and Roberts (1990), this will increase the total return of the company activities.

Complementarity and substitution are often defined referring to the effects on the demand for a product or service from marginal changes in the price of another product or service. In this report, we mainly focus on complementarity

---

[1] Some of the large travel agencies have integrated such services by the use of alliances and interlinking.

and substitution as a relationship between the *use* of different products and services. Product complementarity is defined by Samu, Krishnan, and Smith (1999, p. 59) as "consumers` perception of the necessity of one product for the performance or use of the second product". An example of two complementary products is camera and film. Thus, complementarity point to a situation where the use of one product increases as a result of the increased use of another related product. Supplementary services are often described as services that are not part of the core service, but who have the potential to add value to the core service. It is supposed that supplementary services differentiate the service from other competing offerings and add value to the customers (Anderson and Narus, 1995; Riel, Liljander, and Jurriëns, 2001). A third construct used to describe new and innovative products in relation to established products is substitution. Product substitution means that a new product will be used instead of an existing product and that the use of the existing product therefore will be reduced.

The definitions of complementary, supplementary and substitution described above are related to products and services. However, they can be used on media and channels as well. According to the definitions set forth above, the relationship between existing and new channels may be categorized as shown in table 2.1.

Table 2.1. The relationship between existing and new channels.

Existing channel use New channel use	Increase	Constant	Decrease
Increase	Complementary	Supplementary	Substitute
Constant	Supplementary	Supplementary	Supplementary
Decrease	Substitute	Supplementary	Complementary

As seen from table 2.1, when increased use of a new channel leads to increased use of an existing channel, the channels complement each other. New channels that do not affect the use of existing channels are described as supplementary channels. However, although supplementary channels do not influence the use of existing channels, they can influence the perception of the core product presented in existing channels. Channel substitution points to a situation where increased use of a new channel introduced on the market reduces the use of existing channels on the market.

Solomon and Englis (1994) argue that consumers are multiple media users and point to the strategic importance of holistic views on communication and consumption. Particularly relevant here is what they call functional complementarity; "that a product is jointly consumed with another to facilitate proper operations" (Solomon and Englis, 1994, p. 58). This functional complementarity might as well be used to describe the importance of offering customers access to a set of complemetary channels to facilitate proper access and operations to a product or a brand.

The performance enhancing capacity of Internet channel addition is discussed by Geysken, Gielens and Dekimpe (2002). The main demand side advantages mentioned are market expansion, brand switching, relationship deepening, and increased brand loyalty. Market expansion may be a result of adding a new channel because the company can reach new customers who yet do not buy their product. The relative advantage of adding a new channel may also increase the demand by winning customers from competitors (brand switching). The authors also argue that relationships can be deepened by adding new channels, and exemplifies this by Barnes and Noble who experienced record sales in its physical stores when adding Internet as an additional channel. The last demand side advantage mentioned by the authors is that Internet makes it possible for

customers to save time and money through reduced search cost and reduced shopping time. The alternative, visiting physical shops to search for more detailed information and try the products, will be too costly. Instead, customers will infer the missing information based on information heuristics. Such a heuristic may be their overall evaluation of the brand, thus increasing their brand loyalty. Although Geysken, Gielens and Dekimpe (2002) and Alba et al. (1997) point to several demand side advantages as a result of Internet channel addition, they also discuss a few potential demand side disadvantages as a result of Internet channel addition. It may be that customers actually take advantage of the cost transparency enabled by the Internet and use shopbots and product comparison applications available on the Internet. If so, this will lead to reduced prices, more brand switching, and consequently, reduced margins and profits for the companies. Another point also mentioned, is that impulse buying can be reduced on the Internet when compared to physical stores. This will reduce total sales, and thus, the companies` profit.

Sengupta (1998) proposed that organizational fit, firm size, complementary product opportunity, multiplier effect, and innovativeness all had positive effects on the competitive advantage of complementary products. Empirical results showed support for the effect of innovativeness and the multiplier effect on competitive advantage of complementary products. Innovativeness points to the degree to which a complementary product serve customers need better than existing products. The multiplier effect is the incremental sales volume of the core product that the complementary product generates. Competitive advantage is defined as the superior customer value provided by the complementary product relative to competitors. The strength of the multiplier comes from the incremental value that the new and complementary product gives customers of the core product. This multiplier effect is unique to complementary products in that increased use of the complementary product increases the use of the core

product. It is revealed by Kleinschmidt and Cooper (1991) that innovative products bring greater reward to companies. The more innovative the complementary product the greater is its ability to provide customer value and differentiate the brand or company from competitive brands or companies. Consequently, increasing innovativeness of complementary products increases the complementary product's positive effect on competitive advantage. Thus, by focusing on key technologies and innovative solutions (e.g. SMS and MMS services), complementary products have the potential to differentiate brands from its competitors in the minds of the consumers. This differentiation will result in better performance and competitive advantages.

2.1 Implications of channel additions

In short, this discussion indicates that companies may obtain competitive advantages by adding new channels for marketing and distribution. In particular, this potential can be realized if the services presented are related and integrated across the channels being used. Thus, the use of synergistic channels, meaning mutual enforcement of the channels used, should be implemented by companies. In such situations, addition of new channels will lead to increased use of existing channels (complementary channels). Furthermore, customers will get an increased flexibility in their channel choice when using a service, probably increasing their overall satisfaction with the service.

3 UNIQUE CHARACTERISTICS OF MOBILE SERVICES

There are unique characteristics of mobile devices that make them different from (and often complementary to) traditional Internet-based interfaces. These differences have important implications for the marketing and distribution of products and services (Kannan, Mei Chang, and Whinston, 2001). Although the focus of the study reported here is SMS and MMS, the uniqueness of these services have much in common with other mobile services. Thus, this chapter presents studies of mobile services on a broader basis.

3. 1 Opportunities of mobile devices

One of the most obvious unique characteristics of mobile channels is the lack of constraints related to time and space (Balasubramanian, Peterson, and Jarvenpaa (2002). Although it is often argued that the Internet has made it possible for customers to reach the company anytime they wanted, traditional use of the Internet through a computer does not make it possible for brands to reach their customers whenever they want. A precondition for reaching the customers through the Internet is that they are sitting in front of their computer. Mobile devices, on the other hand, are usually carried around by the customers all the time and everywhere, making it possible for brands to reach their customers anytime and anywhere. For example, buying a book is traditionally spatially constrained because the customers have to visit a book-store at a particular location or get access to a computer (which is usually located at a customers` office or home). Thus, buying a book is also constrained in time due to the fact that the book has to be bought during the opening hour of the book store or when the customer is at the office or at home in front of his/her computer. According to Balasubramanian et al. (2002) time is a resource that is very limited in a modern persons life, and thus, very costly. Channels that are time- and space flexible should therefore be valuated highly by customers. Access to

ubiquitous channels is in particular important for customers for products and services that are time critical (Balasubramanian, et al., 2002; Barwise, 2001). Examples of such products are participation in online auctions, access to stock quotes, purchasing last minute airline tickets, etc. Advani and Choudhury (2001) argue that it will be the time sensitive and location sensitive services that will be most successful in mobile commerce. Services offered through mobile channels vary in how "tied in" they are to the geographical location of the receiver (Balasubramanian, et al., 2002). However, it is possible to map customers' location by the use of GPS systems. An implication of this is that brands can tailor information and services to customers based on their location.

Services available through SMS/MMS can be controlled both by the brand and by the customers (Balasubramanian et al., 2002). The mobile phone can be used both for alerts and requests (Steiner, 2001). Brands can use mobile phones to distribute information about product innovations, coupon announcements, or/and special offers. However, customers can also use mobile channels to ask questions about the use of the product, for example ask about the menu of a restaurant or the evening program of a TV channel, increasing their ability to fully take advantage of the relevant product. The two-way communication between a customer and a brand enabled by mobile channels enhances the possibility for brands to get feedback from their customers. The customer may complete surveys regarding customer satisfaction with a brand, or send more impulsive and immediate feedbacks to the brand when she is particularly satisfied or dissatisfied with a brand experience. In addition to the satisfaction felt by the customer by the possibility of such immediate feedback, it also allows the brand to measure quality control in a timely and cost effective manner (Lot21, 2001). Furthermore, this makes it possible for the brand to make immediate efforts to increase perceived brand quality.

Mobile devices are typically used to coordinate social networks. Information received by one member of a network is often forwarded to other members of the network. Brands broadcasting an interesting MMS informing about a new version of a product will often be forwarded to other people not member of that brand's customer database. Thus, brand information can be distributed on a broader level than the brand's own customer database, thanks to the social interaction among the members of the customer database. An implication of this is that the distribution of brand logos, jingles, slogans, etc. within social networks increases the number of people exposed to the brand, thus increasing brand knowledge. Also, Ling (2001) point to the importance of the mobile telephone as a device for micro-coordination in everyday life - that people with a stressful schedule are using mobile phones to "arrange and rearrange daily appointments and the other logistical details of everyday life on a real time basis" (Ling, 2001).

Doyle (2001) points to the following key characteristics of SMS: SMS is personal, it has a near real time delivery, it has an unobtrusive nature, it has a relative low price, it is simple, supports two way communication, it can be forwarded, and has a location based potential. He summarizes these characteristics in "six SMS types" relevant for brands considering SMS as a marketing tool. Doyle argues that SMS is suitable for 1)"send me stories", the possibility to send relevant and time sensitive information to for example, a loyalty card customer. 2)"save me somehow", which points to the possibility of sending coupons allowing discounts on specific products or services to a mobile phone. 3)"search my server", messages with the intention to stimulate access to the brand's wapsite. 4)"sell me something", which is messages that give the customer the opportunity to buy products and services through text responses. 5)"sort my socializing". This points to the opportunity to send messages that can be forwarded to customers peer group including a response mechanism that

allow friends and relatives to register on the brand's wapsite or website. 6)"send me signals" is a reminder from the brand to the customer, for example that the customer car is due to service, suggesting possible availability.

Barwise and Strong (2002) divide mobile advertisements into six categories. 1) "Brand building", are brand slogans or brand reminding messages. 2) "Special offers" are advertisements used to create special offers. 3)"Timely media teasers" are used to encourage product purchase. The fourth category, called 4) "product, service or information request", points to a solution similar to what Doyle (2001) calls "send me signals"; for instance reminders of Mother`s Day the upcoming Sunday (remember to buy flowers or other presents). The fifth and sixth categories of advertisements are 5) competitions and 6) polls/voting where the brand name is a central issue.

In a study of customers subscribing to such advertisements (hence, this was *permission-based* advertisement services) on their mobile devices, 93 percent were satisfied with the advertisements. As much as 84 percent said they were likely to recommend the advertisement service to a friend. Only 7 percent reported that they would leave the service within three months. Other interesting results were that 81 percent of the respondents did not delete any of the advertisements received prior to reading, 74 percent of the advertisements were read in full, and 77 percent of the ads were read as soon as they were received. The study report that SMS advertisements in general increase brand awareness. Although attitude toward the brand was found to be somewhat more positive among respondents exposed to a brand SMS advertisements than among the control group, this result was not found to be statistical significant. The results from this study have also been reported by Cooke, Nielsen and Strong (2003). A similar study reported by Tsui (2001) revealed that 64 percent of all the ads delivered on mobile phones were opened, and that nearly 3 percent of the

participants of the experiment made a purchase as a result of viewing an ad. The 35 percent of the participants recalled seeing an ad also reported that the ad had made a positive impact on how they evaluate the brand (Tsui, 2001).

Watson, Pitt, Berthon and Zinkhan (2002) argue that the construct "u-commerce" should be defined as "*the use of ubiquitous networks to support personalized and uninterrupted communications and transactions between a firm and its various stakeholders to provide a level over, above, and beyond traditional commerce*" (p.336). Four characteristics of u-commerce are discussed by the authors. Ubiquitous access (or access everywhere), universal access (the possibility to stay connected wherever the customers are), uniqueness (that the information customers receive is adapted to the time of the day, the person's location, and the customer's roles and preferences), and unison access (the integration of various communication systems that enable a single interface or connection point). Furthermore, they argue that the mobile phone is a good example of a device that has the potential to enable all four dimensions of u-commerce.

Four unique features of mobile commerce are emphasized by Siau, Lim and Shen (2001). 1) Ubiquity; that brands can keep in touch with their customers anywhere and anytime, 2) Personalization; communication can be personalized to represent information or services appropriate to the individual customer. 3) Flexibility; mobile devices are portable, and customers can therefore be engaged in various activities while receiving information from a brand or sending requests to a brand. 4) Dissemination; information can be sent to all mobile users within a specific geographic region. Thus, brands have the opportunity to distribute information to large consumer populations. As a results of these characteristics, Siau, Lim and Shen argue that mobile devices give customers the following value-added services; 1) Easy, timely access to information, 2)

immediate purchase opportunity, 3) wireless coupon based on user profiles, 4) beaming money (money transactions and electronic payments), and 5) buddy finding (help the user to find his or her friend in the geographical region or to find a restaurant etc. in a city.

Three unique characteristics of wireless devices over computers and other conventional platforms are mentioned by Kannan, Mei Chand and Whinston (2001) and Mohamed and Gao (2002). They argue that wireless devices are accessible, personal and location aware. "Accessible" refers to the characteristic that mobile phones are portable and available for use at all time. Mobile phones are "personal" because they carry the users` identity and therefore make personalization easier. "Location aware" refers to the possibility to track down where the user's physical location is - which is an important characteristic for conducting user oriented marketing. Kannan et al. (2001) argue explicitly that wireless devices are ideal for customer relationships. The reason for this, they argue, is the ability to provide truly personalized content and service by tracking personal identity, the ability to track consumers across media and over time, the ability to provide content and service at the point of need, and finally, the capability to provide highly engaging content. "*Permission-based alerts delivered to wireless phones capture the attention of consumers, drive responding actions, and build brand awareness*" (Mohamed and Gao, 2002, p. 2).

Similarly, it is argued by The Economist (2001) that a mobile phone is more personal than a computer. This particular point is interesting, given that previous research have found people to perceive even computers as highly personal and animate objects. Specifically, Moon (2002) found that consumers scored significantly higher on attraction and purchase intention when they were presented with an interactive shopping task on a computer they previously had

revealed personal information to, than when they used an unfamiliar computer for the same shopping task. This goes to show that consumers are not only willing to share intimate information to inanimate computers, but they also make indirect social attributions towards these computers in later interactions. Most likely, such conscious or unconscious social attributions will be even stronger for mobile phones, which are perceived as more personal than computers. Mobile phones are used only by the owner of the phone and the owner will carry the phone with her most of the time. Whereas e-mail messages are sent to a computer (the user can read his e-mail from any computer connected to the web), text messages and multimedia messages are sent directly to the user's private mobile phone. Also, the network operator often knows the identity of the individual users and where the user is located at all times. This increases the potential for personalized services and strengthens the consumer's perception that mobile phones are very personal objects.

Also, Lot21 (2001) argues that mobile phones are very personal and that only friends, family and co-workers are allowed access to their cellular phone number. Thus, advertising and other forms of marketing without permission from the owner of the mobile phone is virtually perceived as a crime and will probably harm the brand rather than strengthen it. Therefore, the key to successful wireless marketing is to gain confidence of customers, have a strong focus on security and privacy, and to convey useful information only that will improve the quality of customers' lifestyle or productivity. Given permission from the customer, the brand has an opportunity to begin a profitable conversation and to build customer relationships. "*By using the consumers`
permission to bring them personalized, timely, relevant ads, the relationship is
deepened*" (Lot21, 2001, p. 5).

In a study of SMS advertising, Andersson and Nilsson (2000) argue that the particular strengths of wireless advertising are that it is an exceptionally personal channel, suitable for personal relations between a brand and its customers. They also point to the place- and time independence of the channel as a key advantage compared to other channels. Based on this, one of their main points is that mobile devices improve the possibility for interactive relationships between a brand and its customers. In an empirical study of the effectiveness of SMS advertising they found that SMS advertisements increased brand awareness and intention to purchase the brand. However, no effects were revealed of SMS advertisements on brand attitude.

Studies within the uses and gratification theory also have focused on the unique gratifications of mobile channels. A study by Leung and Wei (1998) revealed that pagers were viewed as a mark of status and social identity. Pagers were used to show fashion and status and to integrate with peer social networks. Another study by Leung and Wei (2000) reported that mobility, immediacy, and instrumentality were among the most important instrumental motives for using cellular phones in addition to intrinsic motives of affection and sociability. A study by Ling (2001b) also shows that mobile phones are used to express fashion and for presentation of self. Results from all these studies indicate that gratifications for using mobile devices are related to expressing characteristics of the individual in addition to functional gratifications. Ling (2001b) also points to the fact that the mobile telephones often are used in public spaces. This make SMS and MMS channels potential services for customers to show their values and attitudes to other people. Thus, this public use makes it possible for customers to express themselves in an open social context. The use of MMS and SMS may thus be construed as an indirect relationship investment for users, in terms of the expressiveness entailed in using such services.

Used intelligently, mobile devices have the potential to help build the relationship between the consumer and the brand. This is due to the direct two-way communication line providing brands with a truly economic, effective and reliable way to communicate with customers (Barbieri, 2002)

3.2 Limitations of mobile devices

The downsides, or limitations, of mobile devices are summed up by Siau, Lim and Shen (2001). Mobile phones have small screens and small multifunction key pads, less computational power, limited memory and disc capacity, shorter battery life, complicated text input mechanism, higher risk of data storage and transaction errors, lower display resolution, less surfability, unfriendly user-interface, and graphical limitations. The wireless communication also adds new challenges when compared to wired network with respect to less bandwidth, less connection stability, less predictability, lack of standardized protocols, and higher cost. Other factors related to interface limitations are lack of standards; slow transmission speeds, and limitations in input, navigation, and readability (Steiner, 2001). The challenges related to mobile devices and advertising is reported to be 1) small screen size, 2) inconsistent formatting across mobile devices, 3) slow download speeds, 4) broad spectrum of technologies, and 5) lack of standardization (Mohamed and Gao, 2002).

According to Newell and Newell Lemon (2001); "*In the wireless world it will be the devices, not the art schools, that will shape the communication*" (p. 42). They also refer to Kate Everett who formulated this in the following way; "*There are no jazzy graphics, no funky fonts and no color*". Thus, due to the rather small screen on mobile devices, the rule seems to be that simple and user friendly solutions should be used rather than creative and complex formats. In a study presented by Poynter Institute, the results showed that 78 percent of the three first eye movements of customers on the screen of mobile devices are

directed on text, not graphics. The result indicates that text should be an effective format when using mobile devices.

3.3 SMS versus MMS

So far, we have not differentiated between SMS and MMS services. However, looking at the limitations of mobile services reported in chapter 3.2, some comments should be given on the differences between SMS and MMS. One limitation is small screens. This is true both for SMS and MMS if we compare the size of the screen with a computer. However, the size of a MMS phone is usually bigger than the size of a mobile phone that does not enable MMS services, making the readability better on mobile phones enabling MMS services. MMS phones also have more memory and storage capacity, making it possible to download more information and information in capacity demanding formats, as for example pictures, videos and graphics. The assertion by Kate Everett; "*There are no jazzy graphics, no funky fonts and no color*" is valid for mobile devices enabling SMS services only. For MMS phones, jazzy graphics, funky fonts, and color may be used to present information to the mobile phone users.

In chapter 1 we referred to King, Lee, Warkenting and Chung (2002) who argue that MMS is the next generation of wireless messaging that will be able to deliver rich media. This is further supported by Pedersen, Nysveen and Thorbjørnsen (2003). They argue that MMS can be used to mediate communication in the same way as traditional text messaging services, but MMS also allows for including more text in the messages and for including audio, pictures, and small video clips. Many MMS phones also include the possibility to record and send audio and to take pictures/videos (camera) and send pictures/videos. So far, relatively few MMS services are offered on the market. Examples of current services being offered are color backgrounds

replacing simple logos, picture services such as services for storing and manipulating pictures taken by users or chosen from an archive, and offerings from media companies repackaging existing media services into MMS- slide shows. Examples of the latter category of services are weather reports, highlights from sports events, highlights from entertainment programs and news services. Mainly because of the larger amount of text allowed in multimedia messages, we also find extended versions of the text based services delivered over SMS. Examples are alert services and financial information services.

Pedersen, Nysveen, and Thorbjørnsen (2003) discuss several dimensions of media that may differ between SMS and MMS - dimensions presented by Te`eni (2001). Examples of the dimensions discussed are channel capacity (cue variety and language variety), Interactivity (participation, mediation, contingency, media richness, propinquity, synchronicity, identification, parallelism, anthropomorphism, interaction involvement, mutuality, and individuation), and adaptiveness (situatedness and timeliness). Although there are some nuances between SMS and MMS on most of these dimensions, the authors point to media richness as the most significant dimension differentiating MMS services from SMS services. Recent studies of MMS use also indicate that MMS use is less synchronous and immediate than SMS use suggesting that SMS and MMS content will involve different communication genres (Kurvinen, 2003).

3.4 Conclusion

When consulting the growing stream of literature on mobile devices and -services, we clearly see some core properties of these devices repeatedly being mentioned by researchers. These characteristics are instrumental in distinguishing mobile services and -ads from services and ads provided through other means of communication - such as computers and television. As illustrated

in table 3.1, we can categorize the unique advantages of mobile services into three primary properties.

Table 3.1 Properties of Mobile Services and –advertising

Author(s)	Information accessibility	Information personalization	Information dissemination
Watson, Pitt, Berthon and Zinkhan (2002)	"Ubiquitous, universal and unison access"	"Uniqueness"	
Doyle (2001)	"Search my server"	"Send me stories", "send me signals"	"Sort my socializing"
Siau, Lim and Shen (2002)	"Ubiquity", "Flexibility"	"Personalization"	"Dissemination"
Kannan, Mei, Chand and Whinston (2001)	"Accessibility", "All time availability"	"Personal", "Location aware", "Customer relationship management"	
Mohamed and Gao (2002)	"Accessibility"	"Permission-based alerts"	
Economist (2001)		"Mobile phones are more personal than a computer"	
Lot21 (2001)		"Deepened relationships through personalized ads"	
Andersson and Nilsson (2000)	"Place and time independence"	"Personal channel suited for interactive relationships between brand and consumer"	
Leung and Wei (2000)	"Mobility", "Immediacy"		"Sociability"

Information accessibility pertains to the instant and ubiquitous access consumers have to the brand/vendor thorough anytime/everywhere services enabled by mobile devices. *Information personalization* refers to the opportunity for brands and vendors to reach consumers with a highly personal, relevant and timely message. The various permission-based services now available, aimed at satisfying each individual mobile user's information needs, are proposed to be highly effective tools for building and maintaining long term relationships between consumers and their brands. The final category, *information dissemination*, pertains to the mobile service features aimed at spreading a message or service in a social or professional network. For the individual consumer, such communication features may be highly instrumental in managing her own working- or everyday life. Moreover, the use of such services

may give the consumer social advantages through the self-expressiveness of using novel or popular mobile services.

The three overall properties listed above will be used as a basis for the propositions set forth in section 4.3 below. Since the flexibility represented by information access, personalization and dissemination is unique for mobile devices when compared to that of other communication vehicles, we deem these three properties to be good points of departure for analyzing effects of mobile channel additions.

In the following section we present the theoretical framework of the report. Next, we develop and discuss some general propositions on the effects on SMS/MMS channel additions on consumer-brand relationship ties.

4 THEORETICAL FRAMEWORK AND PROPOSITIONS

To study the effects of SMS- and MMS channel additions on consumer-brand relationships, we chose to rely on a model partially adopted from relationship theory in social psychology. The relationship metaphor has previously been used to describe and understand consumer behavior in a wide array of business contexts, including business-to-business settings, company-to-consumer settings, and consumer-to-brand settings (cf. Berry, 1983; Dwyer, Schurr and Oh, 1987; Sheth and Parvatiyar, 1995; Gwinner, Gremler and Bitner, 1998; Blackston, 1992; Fournier, 1998). A main reason for applying the relationship metaphor here is thus its proven ability to explain consumer behavior across a variety of situations and levels. Also, as the mobile phone is perceived by consumers as being more personal than e.g. a computer, a relationship framework seems particularly appropriate for this setting. Moreover, and in contrast to other relational marketing constructs - such as brand loyalty -, the relationship construct is regarded as being more dynamic, multi-dimensional (Crosby, Evans and Cowles, 1990; Dwyer, Schurr and Oh, 1987; Dorsch, Swanson and Kelley, 1998), multi-leveled (Sheth and Parvatiyar, 1995; Berry, 1995), and multi-phased (Scanzoni, 1979; Dwyer, Schurr and Oh, 1987; Jap and Ganesan, 2000), and is thus proposed to be a better predictor of a wider range of customer behavior variables (Fournier and Yao, 1999).

4.1 Consumer - brand relationships

Recently, an increasing stream of research on relationships at the *consumer-brand* level has emerged (Blackston, 1992; 1993; Fournier, 1994; 1998; Fournier and Yao, 1997; Thorbjørnsen, Breivik and Supphellen, 2002). By the same token, several authors have recently addressed the topic of how consumers form and maintain relationships with brands through the Internet and other

interactive interfaces (Holland and Baker, 2001; Thorbjørnsen, 2002; Thorbjørnsen, Supphellen, Nysveen and Pedersen, 2002).

Relying partially on Fournier (1994; 1998), we here define consumer-brand relationships as long-term, dynamic and affect-laden ties between a consumer and a brand which include some form of interdependence, shared history and instrumental- or socio-emotional bonds. The concept of brand relationship represents in many ways an essential re-articulation of consumer-brand loyalty that may prove fruitful because 1) not all loyal brand relationships are alike, neither in strength nor in character, 2) many valuable brand relationships are not identified as "loyal" according to dominant theoretical conceptions, and 3) current approaches to classification accept some brand relationships that do not possess assumed characteristics of "loyalty" or "strength" at all (Fournier and Yao, 1997). Moreover, a multi-faceted conceptualization of consumer-brand relationships may give us more diagnostic insights in how brands should manage their total marketing- and media mix for controlling various important relationship outcome variables - such as positive word-of-mouth, habitual tendency and repeat purchase intention - through influencing different relationship dimensions. This is especially important from a managerial point of view.

4.2 Conceptual model

Both the Interdependency model and the Investment model have been used to describe interpersonal relationships within the discipline of social psychology. The Interdependency model was proposed by Thibaut and Kelley (1959) and outlines two sources of dependence: satisfaction with the present relationship partner and the quality of alternative partners. In marketing, these two concepts are easily translated to "brand satisfaction" and "perceived quality of alternative brands". The level of *brand satisfaction* refers to the sum of positive versus

negative affect towards the relationship/brand partner. This construct is often conceptualized in terms of brand performance expectations, perceived brand performance, and confirmation/disconfirmation of brand performance expectations (Yi, 1990). The main ideas proposed in the disconfirmation paradigm are that increased brand performance increase brand satisfaction and that performance that confirms or exceeds expectations increase satisfaction. In the Interdependency model, satisfaction is proposed to be positively associated with relationship stability. The *quality of alternative brand* partners simply refers to the subjective evaluation of the quality of ones partner versus the quality of the best available alternative partner. According to Thibaut and Kelley (1959), most people have a "comparison level for alternatives"- the kind of outcome they think they would receive in some other, alternative relationship (Brehm, 1985). This concept is an important, yet under-researched concept in marketing theory (Fournier and Mick, 1998). In the Interdependency model, quality of alternative partners is proposed to be negatively associated with relationship stability.

The Investment model proposed by Rusbult (1980) is an extension of the Interdependency model. The Investment model has been used to predict relationship stability in many types of romantic relationships as well as in friendships and in organizational settings (Rusbult, 1987; Rusbult, Martz and Agnew, 1998). The model contains four basic constructs contributing to the prediction of relationship stability; commitment and three bases of dependence – satisfaction level, quality of alternatives and investment size. Similar to conceptualizations in marketing, commitment level is defined as the intent to persist in a relationship, including long-term orientation toward the relationship as well as feelings of psychological attachment. The two first sources of dependence, satisfaction and quality of alternative partners are adopted from the Interdependency model and thus, described above. The third source of

dependence is the investment of resources in the relationship (Rusbult, 1980). Relationship investment refers to the magnitude and importance of the resources that are attached to a relationship – resources that would be lost if the relationship were to end. Some investments are direct (*direct relationship investments*) – such as time, money and other efforts – while other investments may be indirect (*indirect relationship investments*) and come into existence when originally extraneous resources such as mutual friends, personal identity or shared material possessions become attached to the relationship (Rusbult, Martz and Agnew, 1998). According to the Investment model, an individual's commitment to a relationship should increase as to the extent that she is satisfied with the relationship, has no good alternatives, and has a lot of direct and indirect investments in the relationship. Relational behavior reflects actual behavior among relationship participants. The relationship investment model can thus be illustrated as follows:
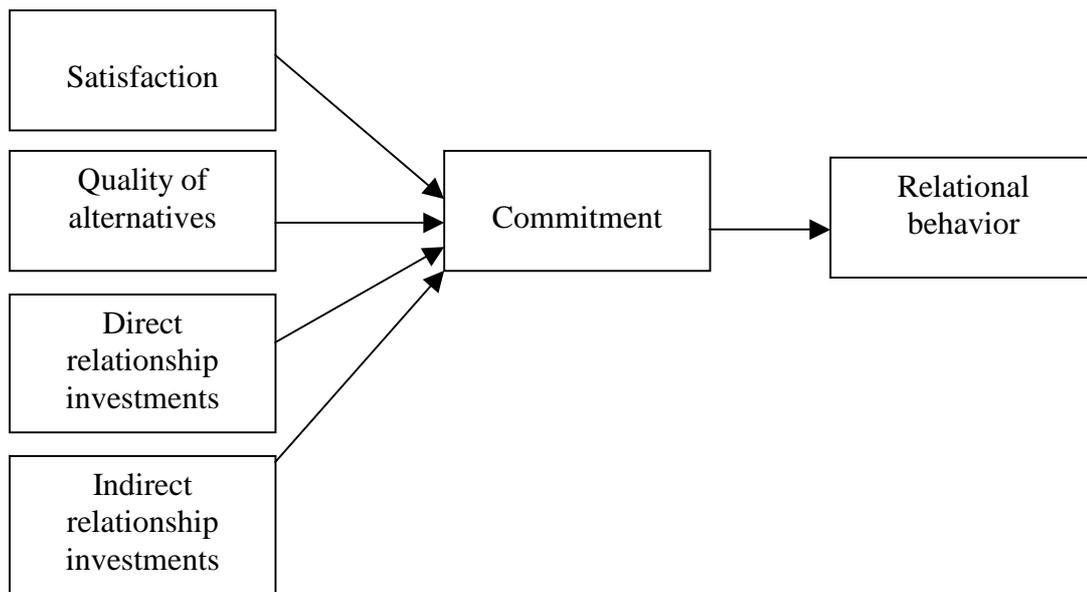
Figure 4.1 The Relationship Investment Model (Rusbult, 1980)

This model is simple and resembles models of satisfaction found in the marketing literature (cf. Oliver, 1997), although the quality of alternatives is rarely included. However, one of the main contributions of the Interdependency model is perhaps the decoupling of satisfaction from relationship stability (Berscheid and Reis, 1998), since satisfaction in this model is only one of four predictors of relationship stability. The model is also quite simple in terms of the number of included relationship dimensions, but highly diagnostic in that it specifies a causal structure between the independent and mediating variable(s). In these respects we prefer this model over the more well-known Brand Relationship Quality (BRQ) -model of Fournier (1998) (for a more thorough discussion of BRQ, see also Nysveen, Pedersen and Thorbjørnsen, 2001; Thorbjørnsen and Breivik, 2002; and Thorbjørnsen, 2002). Moreover, the investment model has previously proven to be diagnostic and predictive in explaining various behavioral outcomes of consumer-brand relationships for

technological products such as PDAs and computers (Thorbjørnsen, Breivik and Supphellen, 2002).

We extend this model by including *brand knowledge* as a determinant of brand commitment and -behavior. Brand knowledge (also referred to as brand equity) consists of brand awareness and brand associations/image (Keller, 1993). Awareness is an important factor for the brand to be included in the consumers' consideration set, and has also been found to influence behavior directly in low-involvement and inertia -situations. Brand associations are conceptualized as the information nodes linked to the brand in memory and contain the personal meaning of the brand for consumers. The type, strength, uniqueness and favorability of brand association are influential in determining the consumers' commitment and subsequent actions towards the brand. When supplementing Rusbult (1980)'s Relationship Investment Model with the concept of brand knowledge, and incorporating our independent variables (SMS/MMS channel additions), the conceptual model underlying this study can be depicted as follows:
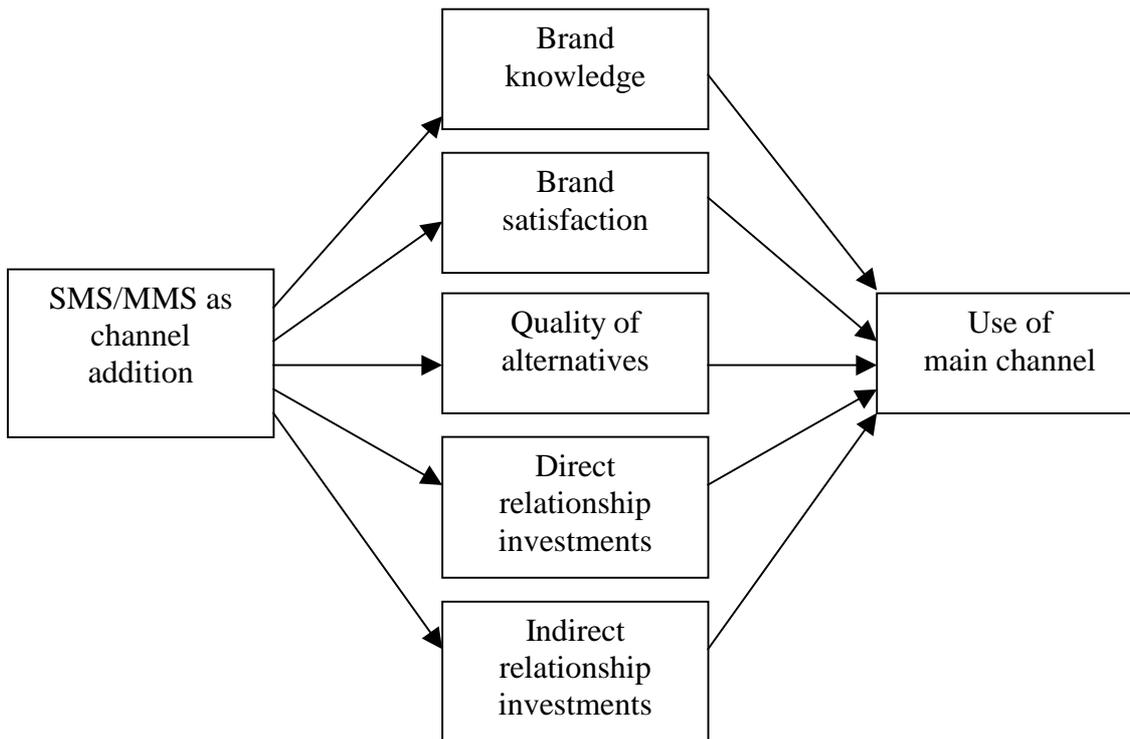
Figure 4.2 Conceptual Model

As can be seen from figure 4.2, SMS and MMS has been included as antecedents of the variables proposed to mediate relational behavior. Due to the purpose of the study reported here and the well established link between the mediating variables included in figure 4.2 and commitment, commitment as an attitudinal construct was not included in the study reported here. Rather, direct effects of the mediating variables are postulated on relational *behavior* - here defined as use of the brand's main channel.

4.3 Propositions

Below, propositions regarding effects of SMS and MMS are proposed according to figure 2. First we present propositions of SMS/MMS on the mediating variables in the model (proposition 1 - 5). Second, propositions regarding effects of the mediating variables on relational behavior (main channel use) are proposed (Proposition 6 - 10). Although there are a few differences between

SMS and MMS services (in particular media richness), many dimensions are shared between the two services. We, therefore, do not differentiate between the two services when propositions are presented. Instead, differences between the findings between SMS and MMS services are presented and discussed with reference to relevant theory in section 9.

SMS/MMS as channel addition - Effects on brand knowledge

Brand knowledge is here defined in terms of brand awareness and brand associations (Keller, 1998). Customers using brand services through SMS/MMS channel additions are exposed to the brand logo, symbols, slogans etc. through a different and additional channel. Increased exposure for brand-elements through a qualitatively different medium contributes to increased brand "top of mind saliency" and, consequently, increased recognition and awareness of brand elements. Due to the possibility to forward mobile messages within social networks (Siau, Lim and Shen, 2002), brand awareness is realized also outside the brand's existing customer base. Such an increased awareness will in turn contribute to a higher confidence among consumers when it comes to differentiating the relevant brand from competing brands. Increased brand awareness is associated with increased customer understanding of what are the unique characteristics of the brand. In sum, this should imply that increased use of channel additions would positively influence brand knowledge through inflated brand awareness.

According to Keller (1996), multiple channels should be used in marketing communication to create positive brand associations. The reason for this is the encoding variability principle; arguing that information presented in varied contexts "*cause information to be encoded in slightly different ways. As a result, multiple retrieval routes are formed in memory - each converging on the to-be-remembered information - thereby enhancing recall*" (Keller, 1996, p. 113; see

also Melton, 1970; Young and Belleza, 1982). An implication of this is that companies should take advantage of various channels and presentation formats for communication with their customers. This will provide multiple cues to recall information, thus improving the performance of memory. The improved memory performance, then, will lead to stronger brand associations in memory. A related theory, the dual coding theory, predicts that pictures are encoded as imaginal codes in memory while words are represented as verbal codes (Unnava and Burnkrant, 1992). The number of memory codes acts as multiple retrieval routes for brand associations. Thus, presenting brand information in various channels and formats improves the number of retrieval cues for brand associations, and will, thus, strengthen brand knowledge.

In addition to the line of arguments presented above, Klein (2003) propose that media richness, defined as the sensory breadth (number of community channels) and depth (quality within each channel (Steuer, 1992)[2], has a positive effect on channel users perception of beliefs about- and attitude toward the product communicated through the channels. Adding SMS/MMS will increase the number of communication channels, increase media richness, and thus, have a positive effect on the evaluation (image) of the product or brand presented in the channels.

In chapter 3, a study by Andersson and Nilsson (2000) was reported. The study revealed a positive effect of SMS advertisements on brand awareness and intention to purchase a brand. Based on this empirical result, and the line of arguments presented in the sections above, we propose the following relationship between SMS/MMS channel addition and brand knowledge.

---

[2] This definition of media richness diverges from the more traditional definition found in information richness theory (Daft and Lengel, 1984).

Proposition 1: *Consumer use of SMS/MMS channel additions are positively related to brand knowledge.*

SMS/MMS as channel addition – Effects on brand satisfaction

Increasing the availability of a brand by adding new channels with access to the brand gives the consumer a better flexibility and freedom of choice. By adding SMS/MMS as new channels, the flexibility means access to the brand independent of time and location - i.e. increased information accessibility. Such channels additions will be perceived as a value-added offer by the customers. Channels that are time and location flexible are highly valuated by customers (Balasubramanian, et al., 2002). In particular in the first period of the channel addition, this value-added service will be perceived as better than expected among the customers, thus, according to the confirmation paradigm, increasing their satisfaction with the brand (Yi, 1990). Also, the interactive element of mobile devices, making it possible for customers to have a dialogue with the brand anytime and anywhere (Lot21, 2001), should have the potential to increase customers` satisfaction with the brand. The "send me signals" element noted by Doyle (2001) points to the possibility a brand has to notify the customer about special offers, Mother`s Day, etc. This way of using MMS and SMS may help to organize customers` everyday life, thus increasing their satisfaction with the brand. Another perspective is presented by Riel, Liljander and Jurriëns (2001). They argue that satisfaction with supplementary services, defined as services that are not part of the core service, will have the potential to strengthen customers` perception of the core service. In a study of a medical publisher service, where online services were added as an extra channel to catalogue, they found that the addition of an online channel had a positive effect both on value perception of the core service and on satisfaction with the core service. We therefore argue for a positive relationship between customers` use of a brands` SMS/MMS channel additions and brand satisfaction.

Proposition 2: *Consumer use of SMS/MMS channel additions are positively related to brand satisfaction.*

SMS/MMS as channel addition – effects on quality of alternatives

SMS/MMS as channel addition makes access to the brand place and time independent. Thus, the relative brand quality is probably increased through increased information accessibility (Siam, Lim, and Shen, 2002; Watson, Pitt, Berthon and Zinkhan 2002). Also, it seems reasonable to argue that the use of information personalization through interactive SMS/MMS relationships between the brand and the customer increases the perceived relative quality of the brand (Lot21, 2001; Andersson and Nilsson, 2000). In the satisfaction literature, a close relationship is often proposed between service quality and service satisfaction. For example, Oliver (1993) and Fornell et al. (1996) argue for an effect of quality on satisfaction, while Bolton and Drew (1991) and Cronin and Tayor (1992) argue for an effect of satisfaction on quality. Thus, it can also be argued that all the positive effects of SMS/MMS on brand satisfaction proposed above also will be relevant for customers` perception of a brands quality. Consequently, the relative quality of the brand increases, thus, reducing the perceived quality of alternative brands. We therefore propose a negative relationship between SMS/MMS channel addition and the perceived quality of alternative brands is to be expected.

As argued by Riel, Liljander, and Jurriëns (2001), supplementary services differentiate a service from competing services, thus increasing the relative satisfaction of a service. "*Supplementary services are used to differentiate the service from similar competing offerings and to add value to customers*" (Riel, Liljander, and Jurriëns, 2001, p. 362). According to Kleinschmidt and Cooper (1991), the differentiating effect will be higher for higher levels of innovative

supplemental services. Based on this argument, adding SMS/MMS as brand channels will increase the relative perceived quality of a brand among customers.

Proposition 3: *Consumer use of SMS/MMS channel additions are negatively related to perceived quality of alternatives.*

SMS/MMS as channel addition – effects on direct relationship investments

Direct relationships point to time, money and other efforts invested in a brand. Such relationships can be based on both economic and psychological values. Time refers to the time spent learning to use the brand, and money includes money spent on building a relationship with the brand - money that will be considered sunk cost if the relationship is ended. Examples of monetary costs that may have been invested in a relationship can be pre-paid subscriptions, and discounts and bonus savings based on a long relation that will be lost if the relationship is ended. Examples of psychological costs may be that personal profiles have to be rebuilt at another brand if the relationship is ended. This means that the customer has to go through a procedure with a new brand to reveal information about herself in order to reestablish a personal profile at the new brand. Offering SMS/MMS as channel additions increases the available channels for building direct relationships. Engaging customers in taking advantage of SMS/MMS as channel additions increases the number of channels to build direct relationships. The more channels a brand offers its customers, the greater the potential for strengthening direct relationships is. If the customer has invested time, money and other efforts in a brand through many channels, the total level of relationship investments are higher than with a lower number of brand channels. Thus, using SMS/MMS as brand channels will increase direct relationship investments.

Proposition 4: *Consumer use of SMS/MMS channel additions are positively related to direct relationship investments.*

SMS/MMS as channel addition – effects on indirect relationship investments

Indirect relationship investments come into existence when originally extraneous resources such as mutual friends, personal identity or shared material possessions become attached to the relationship (Rusbult, Martz, and Agnew, 1998). The information dissemination dimension reported in table 3.1 points to the possibility of SMS/MMS to forward and share material. The possibility for immediate feed-back anywhere and anytime (information accessibility) enables real time sharing of material in a relationship. Material sharing also makes it possible for customers to share information about their personal interests and preferences with the brand. Access to such information about its customers gives a brand the opportunity to personalize their services and to serve the customer according to its preferences. Functions such as "send me signals" (Doyle, 2001) – for example that the brand sends reminders to the customers that e.g. the car is due to service or that it is Mothers day tomorrow (buy your Mother a present) - may contribute to a feeling of being cared for by the brand. Thus, the customer may start to look at the brand as a friend. SMS/MMS may also be used to express social or personal identity. Furthermore, information dissemination enabled by SMS/MMS helps customers to show who they are, and using the service reflects customers' values. We therefore believe that the use of SMS/MMS as brand channel additions may strengthen indirect relationship investments.

Proposition 5: *Consumer use of SMS/MMS channel additions are positively related to indirect relationship investments.*

Effects of Brand Knowledge on Main Channel Use

According to Keller (1993), the higher the brand awareness among consumers and the more unique, favorable and stronger the brand associations, the stronger become the overall consumer knowledge of the brand, which in turn increases brand equity and brand usage. Thus, we propose that the total main channel usage will increase due to the leverage of overall brand knowledge (awareness as well as associations).

Propositions 6: *Brand knowledge is positively related to main channel usage.*

Effects of Brand Satisfaction on Main Channel Use

The consumer behavior literature contains hundreds of articles concerning the positive effect of brand satisfaction on brand loyalty and brand repurchase. Although these effects are not necessarily simple and straightforward (cf. Bloemer and Kasper, 1995), the vast majority of researchers would certainly agree on the general positive correlation between satisfaction and loyalty/repurchase. Consequently, and in line with the many studies revealing a positive relationship between overall brand satisfaction and brand product usage, we propose a positive effect of brand satisfaction on brand main channel usage.

Propositions 7: *Brand satisfaction is positively related to main channel usage.*

Effects of Quality of Alternatives on Main Channel Use

Quality of alternatives refers to the perceived desirability of available brand alternatives. According to Rusbult, Martz and Agnew (1998), quality of alternatives is negatively related to both commitment and relationship behavior. That is, the more attractive the available brand partners, the less committed to and inclined to use the brand will the consumer be. Consequently, we would

expect that as the quality of alternatives increases, the consumer's use of the brand's main channel will decrease.

Propositions 8: *Quality of alternatives is negatively related to main channel usage.*

Effects of Direct Relationship Investments on Main Channel Use

Investment size refers to the magnitude and importance of the resources that are interwoven in a relationship - resources that would decline in value or be lost if the relationship were to end. Direct relationships are investments of time, money or other resources tied to the acquisition, learning and use of the mobile services. As relationships develop, consumers may invest many resources directly into the relationship in the hope that doing so will improve it. Relationship investment enhances commitment, and in consumer-brand relationships, it facilitates loyal brand behavior, since the act of investment increases the cost of ending the relationship serving as a powerful psychological inducement to persist (Rusbult et al, 1998). Consequently, we propose that direct relationship investments will positively influence main channel usage through processes of dependence and psychological attachment.

Propositions 9: *Direct relationship investments are positively related to main channel usage.*

Effects of Indirect Relationship Investments on Main Channel Use

Indirect relationship investments are originally extraneous resources (such as friends, social networks or social status) that over time have come attached to the brand relationship. For example, using a mobile service may leverage the status of a consumer among his/her friends or give him/her access to new social networks. Hence, these extraneous resources now become closely intertwined

with the consumption of the service and parts of these resources might be lost if the relationship to the service vendor is terminated. Similar to direct relationship investments, we expect indirect investments to introduce sunk costs to the relationship, increase brand partner dependence and leverage consumer-brand relationship ties. This may in turn lead to increased consumption of the brand's primary channel.

Propositions 10: *Indirect relationship investments are positively related to main channel usage.*

5 METHODOLOGY

Three studies were conducted for three categories of services to study the effects of both SMS and MMS channel additions on consumer-brand relationships. The first brand, FINN is provider of the largest newspaper and Internet classifieds service in Norway. The second brand, TV2 is Norway's largest commercial TV broadcasting company. It also presents services such as news, weather forecasts, entertainment and sport on the Internet. Big Brother, the third brand, is a reality show presented by the Norvegian broadcasing company TV-Norge, through 24 hour cable and broadband subscriptions channels and on the Internet. In the rest of this report, these three studies are referred to as the Finn study, the Big Brother study and the Drop study, respectively.

5.1 Design, procedure and sample characteristics

All three surveys included a pre-test study and a post-test study. The pre-studies were announced on the website of the three services included in the survey, namely www.finn.no, www.tv2.no/mmsdropp/tv2/, and www.bigbrother.no/2003/. Respondents clicked on the interactive announcement texts, and got access to an online questionnaire. The first page of the questionnaire presented information about the study and the respondents' possibilities to win prices by taking part in the study. The respondents were informed that the estimated time of completing the pre-study was 10 to 15 minutes. At the end of the questionnaire respondents filled in contact information, either a postal address or their preferred e-mail address. Respondents who reported a postal address received an information letter and a post-test questionnaire two weeks later. They were requested to answer the enclosed questionnaire and returned it to us in an enclosed prepaid envelope or to visit a website to fill in the post-test questionnaire. Respondents reporting

their e-mail address were contacted by e-mail two weeks later and asked to visit a website to fill in the post-test questionnaire. A sample pre-test questionnaire used in the Big Brother study is shown in appendix A. Table 5.1 gives a description of respondents` characteristics.

Table 5.1 Sample characteristics

	Big Brother (n = 374)	**Finn** (n=368)	**Drop** (n=226)
Age			
0 - 19	10.7	4.6	22.2
20 - 29	48.5	42.5	43.6
30 - 39	28.7	33.5	20.4
40 - 49	8.8	15.5	7.6
50 - 59	2.9	3.5	4.9
60 and above	0.3	0.3	1.3
Education			
Primary	12.1	4.4	9.4
Secondary	49.9	29.2	50.9
University =< 3	27.9	35.4	21.9
University => 4	10.2	31.1	17.9
Sex			
Male	31.7	58.6	75.7
Female	68.3	41.4	24.3
Mobile Operator			
Telenor	48.4	45.6	21.8
Netcom	33.7	34.1	68.9
Sense	5.1	5.5	1.8
Tele2	2.9	2.2	3.1
Other	9.9	12.6	4.4

The majority of respondents are between 0 - 39 years old. The category of 20 - 29 years old subjects is the largest category for all three services studied. Secondary school education is the dominating level of education for two of the services. The exception is FINN where University=<3 is the dominating group. We also see that male respondents dominate two of the services. The exception here is Big Brother, where 68.3 percent of the respondents are female. When it comes to mobile operators, Telenor and Netcom are the most frequently used. As can be clearly seen, Netcom is the dominating operator for the Drop service.

The reason for this is most likely that Netcom customers can use this service free of charge. In total, table 5.1 illustrates the variety categories of services and in user characteristics of the three studies reported here.

5.2 Measures

The model presented in figure 4.2 includes seven constructs: SMS/MMS as channel addition, brand knowledge, brand satisfaction, quality of alternatives, direct relationship investments, indirect relationship investments, and main channel use. All items are found in table 5.2. *Main channel use* was measured through two items tapping the respondent's actual use of the main channel (i.e. the Big Brother TV show, Finn Internet services or TV2 broadcast services). The items reflect recent recall of service use as well as general recall of service use. Similar items have been used in several broadcasting and electronic media studies (Conway and Rubin, 1991, Perse, 1996). *Brand knowledge* is conceptualized by Keller (1993; 1998) as consisting of brand awareness and brand associations. Three items were used to tap brand knowledge including one item focusing brand recognition and two items tapping brand associations. The third item focused the differentiating and unique profile of the service. *Brand satisfaction* was based on measures focusing on satisfaction with the service and degree of expectation confirmation (Fornell,, Johnson, Anderson, Cha, and Bryant, 1996; Fornell, 1992; Johnsen, Anderson and Fornell, 1995). In addition, a measure of how pleased (Spreng, MacKenzie, and Olshavsky, 1996) the respondents were with the service was included. *Quality of alternatives* was measured by two items focusing the relative quality of the service compared to other services that have the potential to substitute the service. *Direct relationship investments* were measured by three items. These items included time invested with the service, emotional relation with the service, and the importance of the service in respondents` everyday life. *Indirect relationship investments* focused on the expressiveness of respondents` personality and

values by using the service, in addition to their perception of how strongly others associate them with the service. Measures of quality of alternatives, direct relationship investments, and indirect relationship investments were based on Rusbult (1980), Rusbult, Martz, and Agnew (1998), and Thorbjørnsen, Breivik, and Supphellen (2002). *SMS/MMS as channel addition* was measured as the level of using SMS and/or MMS as an additional channel to the service's main channel. The three items applied included measures of respondents' perception of their level of using additional channels and their intention to use the additional channel the next six months. Measures are shown in table 5.2.

Table 5.2 Measures

Use of SMS
I use the SMS news service from "service" a lot (Use SMS 1)
I perceive myself as a heavy user of the "service" SMS news (Use SMS 2)
If Big Brother is sent again, I will use the "service" SMS news service a lot (Use SMS 3)
Use of MMS
I use the MMS news service from "service" a lot (Use MMS 1)
I perceive myself as a heavy user of the "service" MMS news (Use MMS 2)
If Big Brother is sent again, I will use the "service" MMS news service a lot (Use MMS 3)
Brand knowledge
"Service" has a profile that is easy to recognize (Brandkn 1)
"Service" differs from its competitors (Brandkn 2)
When exposed to "service" it is easy to recognize it (Brandkn 3)
Brand satisfaction
I am very satisfied with "service" (Brandsat 1)
"Service" satisfies my expectations (Brandsat 2)
I am very pleased with "service" (Brandsat 3)
Quality of alternatives
I have access to other services that are better than "service" (Qualt 1)
The best service in this service category is better than "service" (Qualt 2)
Direct relationship investments
I have spent a lot of time with "service" (Dri 1)
Emotionally, I have a good relationship with "service" (Dri 2)
"Service" is an important part of my everyday life (Dri 3)
Indirect relationship investments
"Service" helps me to show who I am (Iri 1)
"Service" reflects my personal values (Iri 2)
I think others associate "service" with me (Iri 3)
Use of main channel
How much did you use "service" yesterday?
How much do you usually use "service"?

All items were measured on a 5 point Likert scale, except for main channel use where the amount of use was measured through 6 different alternatives (i.e. increasing fixed amounts of time spent using the service).

Due to a high number of measures (composite measures for three services at two points of time), the reliability of measures are presented in this chapter for each of the three services. Table 5.3 shows Cronbach's α for the measures used. All reported values of Cronbach's α are based on the pre-test measures.

Table 5.3 Measure reliabilities for the three studies.

Study	Big Brother	Finn	Drop
Measure			
Use of SMS	0.87	0.79	0.87
Use of MMS	0.89	0.85	0.92
Brand knowledge	0.70	0.72	0.70
Brand satisfaction	0.94	0.92	0.89
Quality of alternatives	0.73	0.68	0.56
Direct relationship investments	0.85	0.81	0.80
Indirect relationship investments	0.88	0.92	0.91
Use of main channel	0.84	0.86	0.76

Reliabilities are as low as 0.68 and 0.56 for quality of alternatives. According to Hair, et. al (1998), the lower limit of acceptability range between 0.60 and 0.70. Thus, we consider the reliabilities to be satisfactory except for quality of alternatives for the Drop study.

5.3 Descriptive information

Before we present results regarding the propositions proposed in chapter 4, descriptive data for the three studies are presented. The descriptive information are presented to illustrate some characteristics of the individual services and to make it possible to make comparisons across services regarding the relation between the three brands and its customers. As can be seen, a few more variables are added in these descriptive analysis than the variables included in the model presented in figure 4.2.

Table 5.4 Description of the three services

	Big Brother		Finn		Drop	
	Mean	St.dev	Mean	St.dev	Mean	St.dev
Use SMS	2.03	1.06	1.81	0.87	2.27	1.07
Ease of use SMS	3.92	0.91	3.52	0.74	3.78	0.81
Usefulness SMS	3.46	1.19	3.35	1.07	3.07	1.22
Satisfaction SMS	3.22	1.03	3.29	0.75	3.26	0.91
Use MMS	1.86	1.02	1.56	0.85	2.81	1.39
Ease of use MMS	3.09	1.11	2.94	0.89	3.61	1.08
Usefulness MMS	2.71	1.16	2.73	1.17	3.09	1.21
Satisfaction MMS	2.87	1.06	2.78	0.85	3.17	1.13
Brand knowledge	4.61	0.55	4.37	0.62	3.91	0.76
Brand satisfaction	3.48	1.11	4.17	0.71	3.82	0.77
Quality of alternatives	3.25	1.12	2.34	0.93	3.17	0.91
Dir relationship inv	3.42	1.07	3.19	1.00	3.43	0.93
Indir relationship inv	1.72	0.98	1.57	0.87	1.87	0.95
Brand attitude	3.77	0.97	4.36	0.54	4.05	0.70
Brand loyalty	2.88	1.17	2.77	0.89	2.87	0.99
Use main service	3.84	1.10	3.80	0.99	3.59	0.99

Results for Big Brother illustrate a relatively high level of Brand knowledge among the respondents. The SMS services for Big Brother are generally evaluated higher than the MMS services. Indirect relationship investments are the variable with the lowest score. For Finn, results show high scores for brand knowledge, brand satisfaction, and brand attitudes. Also for Finn, the SMS services are evaluated more positive than the MMS services offered. Respondents' attitudes towards Drop are positive. It is also interesting to notice that the use of MMS services is higher than the use of SMS services for Drop services users. In general, there are only small differences in the evaluation of SMS and MMS services for Drop.

The use of SMS and MMS services are somewhat lower among Finn respondents than among Big Brother and Drop respondents. However, the respondents have a more positive attitude toward Finn than toward Drop and Big Brother, and the respondents are in general more satisfied with Finn than with Big Brother and Drop. A particular characteristic for the Finn service is that quality of alternatives is considered very low when compared to the other services. Thus, Finn seems to have a fairly strong brand in the market it operates when compared to Big Brother and Drop.

5.4 Analyses procedure

The research propositions are analyzed by using two analyses techniques. The effects of SMS/MMS as channel addition on the mediating variables were analyzed by the use of analysis. of variance. In this study, the same measurements (brand knowledge, brand satisfaction, quality of alternatives, direct relationship investments, indirect relationship investments, and main channel use) were made two times for each subject. There are two ways of analyzing this data material in SPSS 10.0 – the statistical software chosen for the analyses of variance. One option would be to perform separate MANOVA analyses for each time of measurement and compare between-subject effects. The second option would be to use the GLM[3] repeated measures procedure to analyze both overall between-subject effects and within-subject effects. We chose to use this second option for two primary reasons. First, performing multiple MANOVAs for testing the different propositions could inflate the risk of type 1 errors. In multivariate GLM repeated measures, more analyses can be executed simultaneously. Second, GLM repeated measures allow for testing both between-subject effects and within-subject effects. That is, we are able to analyze both the absolute differences in score between the independent variables (that is, level of SMS/MMS channel addition usage) and their impact on the

---

[3] General Linear Model

change in the dependent variables between measure 1 and 2. When testing the relative impact of channel addition usage on consumer-brand relationship ties, we are interested in testing both whether the absolute level of SMS/MMS channel addition usage predicts the *overall strength* of consumer-brand relationship ties (called between-subjects effects), and whether the *decrease/increase* in brand relationship ties between measure 1 and 2 is a function of SMS/MMS usage (called within-subjects effects). According to the propositions presented in chapter 4, the level of brand relationship ties should be compared across levels of SMS and MMS use. To analyze differences between customers with a high level of SMS/MMS use and low level of SMS/MMS use, these variables were dichotomized using the median split revealed for each of the three studies, and the binary use variables were implemented as the independent variables of each analysis of variance.

When analyzing the effects of the mediating variables on the dependent variable, structural equation modeling (SEM) was used. The software tool used for this analysis was Amos 4.01. The measures applied in the measurement model are the same as in the analyses of variance except for the two independent variables SMS use and MMS use which were maintained as the original ordinal variables in these path analyses. It should be noted that the analyses are using observations at time t-1 (pre-tests) for the mobile channel addition use, brand knowledge, brand satisfaction, quality of alternatives, direct investments and indirect investments variables, whereas for main channel use, observations at time t (post-tests) are used. This is to avoid the critique raised against brand relationship based models that commitment effects occur as the result of investments in brand knowledge and brand relationships over time, and should thus be measured in timeseries-designs and not in one-shot measures.

The model presented in section 4 was formulated as a structural path model, and parameters were estimated and analyzed for all three providers and their corresponding services. These models were analyzed in four steps. First, the measurement model was estimated and investigated. Second, the basic model presented in figure 4.2 was estimated. Third, the models including intentions to use SMS and MMS services as independent variables were estimated and investigated, and finally, comparisons were made across models.

In the following, we present the survey results for Big Brother (Chapter 6), Finn (Chapter 7), and TV2 Drop (Chapter 8), correspondingly. In chapter 9 the results for all three services are summed up and discussed.

6 RESULTS - BIG BROTHER STUDY

Although a general discussion of the measures and measure reliabilities for the three studies were presented in the methodology section, the reliability and validity of the measures for the Big Brother study are reported in this chapter before the results are presented. The method used to test validity and reliability is composed of two steps. First traditional confirmatory factor analysis is applied to test the convergence and discriminant validity of our measures. Next, traditional measurement model estimations using structural equation modeling is applied. In general, the method applied for testing the measurement model follows the principles suggested by Hair et al. (1998) and Agarwal and Karahanna (2000).

6.1 Validity

To test the measurement model, confirmatory factor analysis was first conducted applying traditional principal components analysis of all indicators using varimax rotation.The results of this analysis are shown in table 6.1.

Table 6.1. Confirmatory factor analysis for the Big Brother study (factor loadings below 0.35 not shown)

Item/Factor	1	2	3	4	5	6	7	8
SMS-use 1				0.84				
SMS-use 2				0.85				
SMS-use 3				0.80				
MMS-use 1			0.90					
MMS-use 2			0.90					
MMS-use 3			0.74					
Brand knowledge 1						0.76		
Brand knowledge 2						0.59		
Brand knowledge 3						0.87		
Brand satisfaction 1	0.84							
Brand satisfaction 2	0.88							
Brand satisfaction 3	0.87							
Quality of alt. 1								-0.92
Quality of alt. 2								-0.71
Direct investments 1					0.79			
Direct investments 2					0.70			
Direct investments 3		0.42			0.62			
Indirect investments 1		0.85						
Indirect investments 2		0.88						
Indirect investments 3		0.75						
Main channel use 1							0.83	
Main channel use 2							0.81	
Eigenvalues	8.13	2.89	1.76	1.43	1.20	1.00	0.85	0.70
Explained variance	36.97	13.16	8.01	6.48	5.45	4.54	3.87	3.17

From table 6.1 we see that the pattern of factor loadings is as expected. The second indicator of brand knowledge has somewhat low convergence validity. However, when removing the item from the scale, reliability suffers by Cronbach's α being reduced from 0.70 to 0.63. Second, the third item on the direct investments scale has somewhat low discriminant validity. However, when removing this item from the scale, reliability suffers by Cronbach's α being reduced from 0.85 to 0.76. Thus, we choose to keep the items in the scales. With this initial analysis, we conclude that the discriminant and convergence validity of the concepts used in the measurement model are fairly acceptable but that further analysis is required before structural modeling can be applied.

6.2 Results Big Brother - effects of SMS/MMS

According to the propositions presented in chapter 4, increased use of SMS and MMS as a channel addition should have positive effects on all brand relationship dimensions. More precisely, this means that respondents which are more frequently using the SMS/MMS channel addition services would 1) have a higher brand knowledge, 2) have a higher brand satisfaction, 3) perceive the quality of alternatives as lower, 4) perceive higher direct relationship investments, and 5) perceive higher indirect relationship investments than respondents using SMS/MMS to a lesser extent.

As revealed in table 5.1, the samples for all three studies were biased regarding gender, age, education and operator. We therefore tested the effects of these biases on the mediating and dependent variables. No effects of mobile operator or age were revealed for the variables. However, gender had an influence on brand knowledge ($p < 0.05$) and direct relationship investments ($p < 0.05$) (higher score for women than for men), and education was revealed to have a direct effect on all of the 5 mediating variables ($p < 0.05$) and on the dependent variable ($p < 0.05$) (higher score among respondents with low level of education than among respondents with high level of education - opposite direction for quality of alternatives). Consequently, both respondents' education level and their gender were included as covariates when analyzing effects of SMS/MMS channel addition on the mediating and dependent variables.

6.2.1 Results - SMS as channel addition

First we present the results regarding the effects of customers' use of SMS as channel addition on the brand relationship dimensions. Next, we investigate the effects on main channel use.

Effects on Brand Relationship dimensions

Below we present results of SMS as a channel addition for Big Brother. Both between-subject effects (i.e. does level of SMS channel addition usage predict the overall strength of consumer-brand relationship ties?) and within-subject effects (i.e. does level of SMS channel addition usage explain any change in brand relationship ties between measure 1 and measure 2?) are reported. The between-subject test of SMS channel addition usage on brand relationship dimensions are reported in table 6.2 below.

Table 6.2 Effects of SMS channel addition Between subjects]

Variable	F-value	p	SMS USAGE [MEANS]	
			Low	High
Brand Knowledge	$F_{1,289}=3.68$	.056	4,517	4,639
Brand Satisfaction	$F_{1,289}=25.74$	.000	3,152	3,717
Quality of Alternatives	$F_{1,289}=26.05$	.000	3,614	3,041
Dir. Rel. Investments	$F_{1,289}=31.75$	.000	3,014	3,651
Indir. Rel. Investments	$F_{1,289}=38.80$	.000	1,413	2,065

As can be clearly seen from table 6.2, propositions 1 to 5 are all supported. The effect on each relationship dimension is significant and the mean differences are all in the proposed direction. Respondents frequently using SMS channel additions reveal a higher level of brand knowledge and brand satisfaction, perceive alternative brands as being of lesser quality, and experience a higher degree of direct and indirect brand relationship investments compared to

respondents with a lesser degree of SMS channel addition usage. These findings are also fairly robust when we control for gender, education and the respondents MMS usage. However, the effect on brand knowledge turned out not to be significant (p=.333) when the covariates were included in the model. Thus, four of five propositions were supported for SMS channel additions. It should also be noted that these effects are significant also when controlling for MMS use. Consequently, SMS has an added effect on the brand relationship dimensions even when possible MMS-effects have been accounted for.

When investigating the within-subject effects, the analysis revealed no significant changes in mediating variables from using SMS between the time of the pre-test and the post-test.

Effects on Main Channel Behavior

For the tests of SMS channel additions to be truly interesting for operators and brands, we need to investigate their effects not only on brand relationship cognition, but also on relationship behavior. Consequently, we here test the effects of SMS channel additions on consumers' subsequent use of the brands' main channel.

Table 6.3 Effects of SMS channel addition [Between subjects]

Variable	F-value	p	SMS USAGE [MEANS] Low	High
Main Channel Usage	$F_{1,314}$=42.87	.000	2,470	3,479

Table 6.3 clearly illustrates that frequent users of SMS channel additions also are more frequent users of the brands' main channel, in this case, the Big Brother TV-show. This effect is robust even when we control for gender,

education and MMS channel addition usage. Thus, the result indicates that SMS is a complementary channel to the brand's main channel.

As was also the case for the mediating variables, no within-subject effects are observed.

6.2.2 Results - MMS as channel addition

Here we first present the results regarding the effects of customers` use of MMS as channel addition on the brand relationship dimensions. Next, we focus the effects on main channel behavior.

Effects on Brand Relationship dimensions

The effects of Multimedia Messaging Services channel addition usage on the five different consumer-brand relationship dimensions are presented in table 6.4 below.

Table 6.4 Effects of MMS channel addition [Between subjects]

Variable	F-value	p	MMS USAGE [MEANS]	
			Low	High
Brand Knowledge	$F_{1,319}=2.041$	.154	4,580	4,655
Brand Satisfaction	$F_{1,319}=42.19$	.000	3,184	3,839
Quality of Alternatives	$F_{1,319}=20.92$	.000	3,503	3,006
Dir. Rel. Investments	$F_{1,319}=23.69$	.000	3,125	3,671
Indir. Rel. Investments	$F_{1,319}=26.98$	.000	1,491	2,021

Table 6.4 shows that effects of using MMS as a channel addition leads to stronger ties between the brand and its customers. As for the tests of SMS channel addition usage, we controlled for gender, education and SMS usage when testing effects of MMS usage on brand relationship variables. The

inclusion of these covariates in the model did not alter the effects listed in table 6.4 significantly, except for quality of alternatives where the p-value now increased to 0.103. The results for MMS channel additions thus follow a similar pattern as that of SMS, in that the effects on brand knowledge are not significant. It should also be noted that these effects are significant also when controlling for SMS use. Consequently, MMS a hierarchy of mobile channel additions effects has again been identified.

Within-subject effects were revealed for direct relationship investments. Consequently, there we identified a significant change in direct relationship investments during the 12 days period between customers with high and low use of the brand's MMS services (F1,289 = 4.54, p<0.05). The differences are illustrated in figure 6.1.
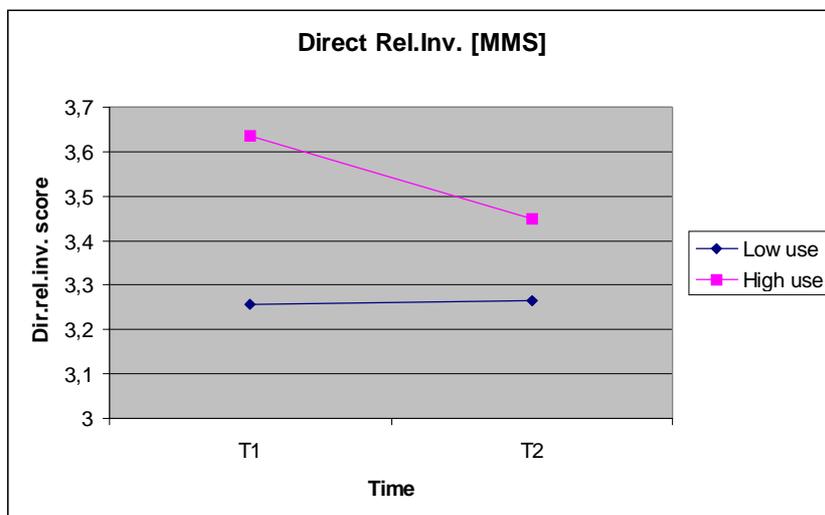
Figure 6.1 Within-subject effects of MMS on Direct relationship investments.

The results show a decrease in the direct relationship investments among the customers using MMS extensively during the 14 days period and only marginal change in the direct relationship investments among the customers who use the

MMS service less extensively. Thus, the result is in the opposite direction of what was expected - a positive effect of using MMS channel addition on direct relationship investment. However, it should be noted that the effect is significant only for one of the five variables focusing relational ties between the customers and the brand. Thus, no general conclusion should be drawn from the result.

Effects on Main Channel Behavior

The effects of MMS channel additions on actual use (viewing) of the Big Brother show is illustrated in table 6.5 below.

Table 6.5. Effects of MMS channel addition [Between subjects]

Variable	F-value	p	MMS USAGE [MEANS] Low	High
Main Channel Behavior	$F_{1,331}$=17.51	.000	2,639	3,352

As for SMS, MMS channel additions appear to boost the use of the main channel. However, when controlling for respondent's gender, education, and SMS channel addition usage, this significant effect disappears. Hence, the effect of MMS channel additions on Big Brother viewing can be attributed to consumers SMS channel usage or to biases due to gender differences.

When investigating the within-subject effects, the analysis revealed no significant changes in main channel use from using MMS between the time of the pre-test and the post-test.

6.3 Results Big Brother - effects of mediating variables

Confirmatory factor analysis of the indicators used in the study was reported in table 6.1. From this analysis we conclude that the discriminant and convergence

validity of the concepts used in the measurement model are fairly acceptable but that further analysis is required.

According to Agarwal and Karahanna (2000), all constructs should share more variance with their indicators than with other constructs. This is shown in table 6.6 along with results for the composite reliabilities of each construct calculated as recommended by Hair et al. (1998).

Table 6.6. Inter-construct correlations and composite reliability

	Composite reliability	SMS use	MMS use	Brand know.	Brand sat.	Quality of alt.	Direct inv.	Indirect inv.	Main channel use
SMS use	0.89	0.87							
MMS use	0.91	0.57	0.85						
Brand Knowledge	0.71	0.14	-0.01	0.67					
Brand satisfaction	0.94	0.34	0.32	0.47	0.92				
Quality of alt.	0.77	-0.21	-0.10	-0.26	-0.53	0.78			
Direct investments	0.85	0.37	0.29	0.54	0.60	-0.53	0.81		
Indirect investments	0.88	0.42	0.39	0.13	0.34	-0.27	0.60	0.84	
Main channel use	0.88	0.39	0.30	0.29	0.47	-0.51	0.71	0.49	0.89

From table 6.6 we see that the composite reliabilities are above the recommended level of 0.5 suggested by Hair et al. (1998). We also see that the average variances shared between constructs and their indicators, shown along the diagonal of the table, are larger than the corresponding inter-construct correlations. The final test of the measurement model is the estimation of measurement model fit. The model was estimated using Amos 4.01 and the fit results are $\chi2/df=2.22$, RFI=0.98, CFI=0.99 and RMSEA= 0.05. These results

indicate very good fit of the measurement model[4], and thus, we now conclude that our constructs have been measured using sufficiently reliable and valid scales.

Next, we estimated the basic model presented in figure 4.2. This model provides the frame of reference for evaluating model fit and explained variances. The model is shown in figure 6.2.
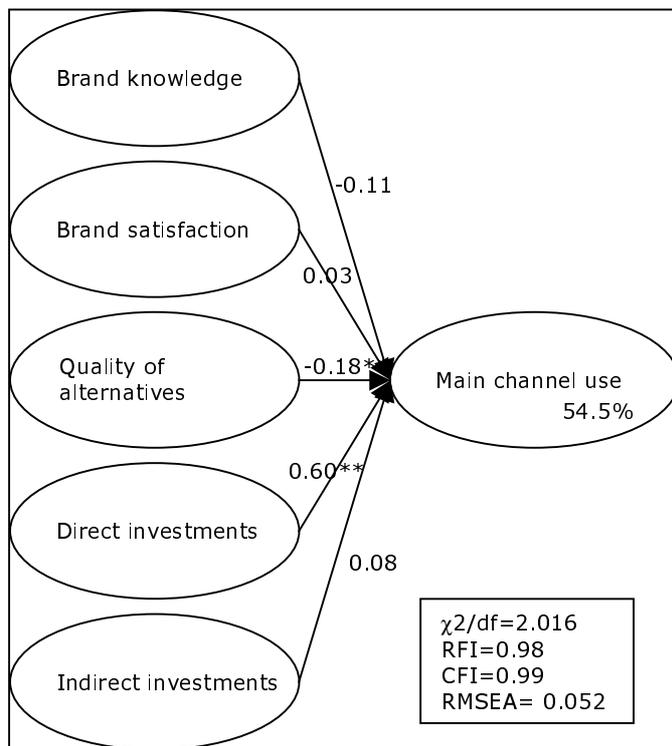

Figure 6.2. The basic model (** indicates significance at p<0.01)

From figure 6.2 we see that the basic model shows good fit when evaluated by absolute and parsimony adjusted fit indexes. The model explains 54.5 % of the variance in main channel use. This is a good model with acceptable fit and

---

[4] According to Browne and Cudeck, cited in Arbuckle and Wothke (1999), a RMSEA less then 0.08 is acceptable. According to Bentler, cited in Battacherjee (2000), $\chi2/df$ should be less than 5, preferably less than 2, and all other indexes should be close to 1 (Taylor and Todd, 1995). In general, we apply the rules of $\chi2/df \approx 3$ or better, RMSEA<0.08 and all other indexes ≈ 1.

explanatory power. We also see that the two significant paths in the model are the relationship between direct relationship investments and main channel use and between quality of alternatives and main channel use. Thus, we conclude that commitment to using Big Brother is mainly explained by perceived direct relationship investments and by perceived quality of alternatives.

We have already established the relationships between SMS and MMS use and the five mediating variables of the basic model (chapter 6.2). We have also investigated the direct effect of SMS and MMS use on main channel use (chapter 6.2). The relevant investigation here is to see if the addition of SMS and MMS use contributes to an increase in the explained variance in main channel use when compared to the basic model and if the relationships between the five mediating variables and main channel use are moderated by mobile channel addition use. The path models were estimated for SMS and MMS services respectively, starting with the model of SMS use shown in figure 6.3.
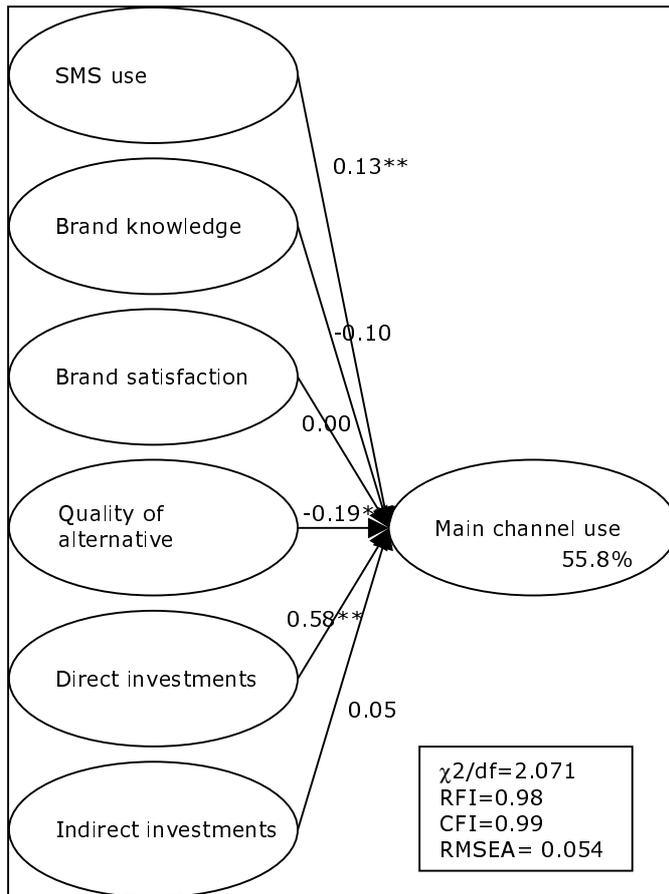
Figure 6.3. Path model of SMS service use (** indicates significance at p<0.01)

From figure 6.3 we see that the model fits the data well and that the model explains 55.8 % of the variance in main channel use. We also see that SMS use has a significant effect on main channel use. The inclusion of SMS use in the model does not contribute to any improvements in goodness of fit, but on the other hand it does not represent a significant reduction in fit despite the addition of new parameters. SMS use contributes to an increase in explained variance in main channel use of 1.3 %.

To assess if SMS use moderates the influence of the constructs in the basic model or if there are direct effects only, we conducted five hierarchical regression analyses of the main effects and interaction effects of the brand

dimensions and SMS use on main channel use. The results are shown in table 6.7.

Table 6.7. Hierarchical regression illustrating moderating effects of SMS use

Independent variables	d.f.	R^2	ΔR^2	B	SE B	β
Brand knowledge	361	5.4	-	0.62	0.14	0.23**
Brand knowledge SMS use	348	17.5	12.1	0.47 0.50	0.13 0.07	0.18** 0.36**
Brand knowledge SMS use Interaction term	347	17.6	0.1	0.65 0.95 -0.01	0.30 0.68 0.14	0.24* 0.68 -0.34
Brand satisfaction	358	18.3	-	0.85	0.07	0.43**
Brand satisfaction SMS use	345	24.4	6.1	0.46 0.37	0.07 0.07	0.34** 0.26**
Brand satisfaction SMS use Interaction term	344	24.5	0.1	0.39 0.23 0.00	0.14 0.27 0.07	0.29** 0.16 0.13
Quality of alternatives	358	20.5	-	-0.61	0.07	-0.45**
Quality of alternatives SMS use	345	28.5	8.0	-0.51 0.42	0.06 0.07	-0.39** 0.30**
Quality of alternatives SMS use Interaction term	344	28.5	0.0	-0.50 0.45 0.01	0.13 0.19 0.05	-0.37** 0.32* -0.02
Direct investments	360	36.8	-	0.84	0.06	0.61**
Direct investments SMS use	347	40.2	3.4	0.76 0.25	0.06 0.06	0.55** 0.18**
Direct investments SMS use Interaction term	346	41.0	0.8	0.54 -0.21 0.12	0.12 0.22 0.06	0.39** -0.15 0.42*
Indirect investments	359	21.9	-	0.72	0.07	0.47**
Indirect investments SMS use	346	27.2	5.3	0.61 0.29	0.08 0.07	0.39** 0.21**
Indirect investments SMS use Interaction term	345	27.3	0.1	0.73 0.37 0.00	0.18 0.13 0.06	0.47** 0.27** -0.12

(** and * indicate significance at $p<0.01$ and $p<0.05$, respectively)

From table 6.7 we see the problems with using regression analyses due to high correlations of latent constructs. Still, as a test of the moderating effect of SMS use it is suitable. We see the main effect of SMS use as identified above. We only find a moderating effect for direct relationship investments. In this case, the main effect of SMS use is lost when introducing the interaction effect. However,

the improvement in explained variance is very small. Thus, we have identified a main effect of SMS use as well as a marginal moderating effect of SMS use on the relationship between direct relationship investments and main channel use. To further investigate this effect, a hierarchical regression analysis including all main effects and the added interaction effect of SMS use and direct relationship investments was conducted. It showed that the interaction term was still significant at the 5 % level and increased the explained variance in main channel use by 0.6 %.

In figure 6.4, a similar estimation of the model using MMS use as the independent variable is shown.
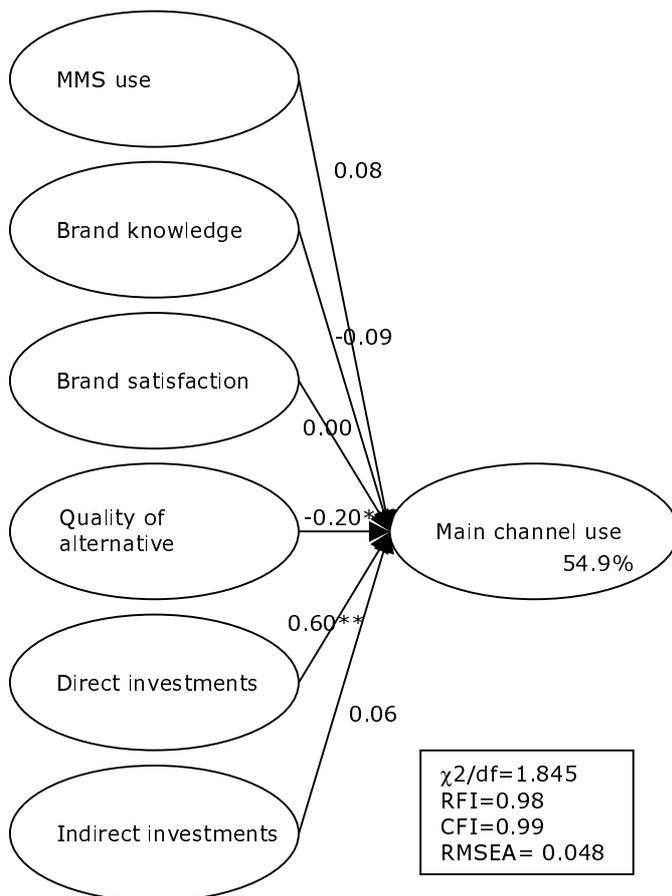
Figure 6.4. Path model of MMS service use (** indicates significance at p<0.01)

From figure 6.4 we naturally find that the model of MMS use is very similar to the SMS model. The model fits the data well and explains a similar, but somewhat smaller proportion of the variance in main channel use. The significant path coefficients from the basic model are found here as well, but MMS use does not seem to have a main effect on main channel use.

To investigate any moderating effects of MMS use we used hierarchical regression analysis in the same way as for SMS use. For MMS use we identified a positive interaction effect of both brand satisfaction and direct relationship investments and MMS use on main channel use. In both cases, the main effect of MMS use identified in individual regression analyses where lost when including the interaction term. The increase in explained variance in main channel use from adding the interaction term was 1.2 % for brand satisfaction and 0.9 % for direct relationship investments. To further investigate this, hierarchical regression analyses was conducted including all main effects and the added effects of the two interaction terms. They showed that both interaction terms were significant if added individually. Thus, MMS use has no main effect in the model but has a moderating effect on the relationship between brand satisfaction and main channel use and direct investments and main channel use. Because only direct relationship investments had a significant main effect in the path model we may conclude that only this interaction effect is significant in the path model as well for this construct investigated individually.

When comparing the basic model and the models of SMS use and MMS use, we see that including SMS and MMS use in the model does not contribute to a significant increase in fit. For SMS use it increases explained variance in main channel use by 1.3 %, and a direct effect of SMS use on main channel use is identified. Furthermore a moderating effect of SMS use and direct investments was found on main channel use. For MMS use, the increase in explained

variance is only marginal and consequently, the main effect of MMS use is not found significant. However, a significant moderating effect of MMS use and direct relationship investments on main channel use was identified.

6.4 Conclusions - Big Brother

The results revealed for Big Brother indicate positive effects both on the mediating variables and on the dependent variable included in figure 4.2. However, the effect of SMS on brand knowledge is weak, and the effect is not significant when control variables are included. Also for MMS, there are no effects on brand knowledge. The effect on quality of alternatives also disappears for MMS when control variables are included in the analysis. Only one within-subject effects was revealed - a negative effect of MMS use on direct relationship investments. Thus, this effect was in the opposite direction of what was expected.

Analysis based on structural equation modeling revealed main effects of direct relationship investments, quality of alternatives, and use of SMS on main channel use. In addition, interaction effects of SMS use and direct relationship investments, MMS use and brand satisfaction, and MMS use and direct relationship investments on main channel use were found.

7 RESULTS – FINN STUDY

A general discussion of the measures and measure reliabilities for the three studies were reported in the methodology section. However, before we present the results of the Finn study, further analyses of the validity of the measures used in the Finn study are reported. We also report analyses of the reliability and validity of the measurement model applying the same procedures as in the Big Brother study.

7.1 Validity

To test the measurement model, confirmatory factor analysis was first applied using traditional principal components analysis with varimax rotation. The results of the analysis are shown in table 7.1.

Table 7.1. Confirmatory factor analysis for the Finn study (factor loadings below 0.35 not shown)

Item/Factor	1	2	3	4	5	6	7	8
SMS-use 1			0.42	0.77				
SMS-use 2			0.40	0.79				
SMS-use 3				0.78				
MMS-use 1			0.90					
MMS-use 2			0.91					
MMS-use 3			0.60	0.42				
Brand knowledge 1							0.81	
Brand knowledge 2		0.35					0.67	
Brand knowledge 3							0.78	
Brand satisfaction 1		0.81						
Brand satisfaction 2		0.88						
Brand satisfaction 3		0.87						
Quality of alt. 1								0.88
Quality of alt. 2								0.80
Direct investments 1						0.75		
Direct investments 2						0.80		
Direct investments 3	0.36				0.35	0.68		
Indirect investments 1	0.90							
Indirect investments 2	0.91							
Indirect investments 3	0.86							
Main channel use 1					0.93			
Main channel use 2					0.91			
Eigenvalues	5.88	3.87	2.07	1.59	1.26	1.05	0.94	0.84
Explained variance	26.71	17.58	9.43	7.24	5.73	4.76	4.27	3.81

From table 7.1 we see that the pattern of factor loadings is as expected. The second indicator of brand knowledge and the third indicator of direct investments have somewhat lower convergence and discriminant validity. However, when removing the brand knowledge item from the scale, reliability suffers by Cronbach's α being reduced from 0.72 to 0.65. When eliminating the direct investment item, reliability again suffers by Cronbach's α being reduced from 0.81 to 0.69. Thus, we choose to retain the items in the scales.

The third item on the MMS use scale has somewhat low convergence and discriminant validity while the first and second SMS use items have somewhat low discriminant validity. When removing the third item on both scales, both

reliability and validity is improved. However, according to Frankforth-Nachmias and Nachmias (1996), the difference between the loadings an item has on two or more factors should be higher than 0.1 to indicate which factor the item reflects. The differences in the cross-loadings reported fro SMS use and MMS use in table 7.1 is all higher than 0.1. In addition, the items used in the variables SMS use and MMS use should not differ across the three studies reported here (Big Brother, Finn, Drop) because this may harm the possibilities for comparing results across services. Thus, both SMS use and MMS use were measured by the three items shown in table 7.1.

7.2 Results Finn - effects of SMS/MMS

Since table 5.1 revealed that the samples for all three studies were biased by gender, age, education and operator, the effects of these biases on the mediating and dependent variables were tested also for Finn. As for Big Brother, no effects of mobile operator or age were revealed for the variables. However, gender had a significant influence on brand knowledge (p<.0.01), satisfaction (p<.0.01) and direct relationship investments (p<.0.01) (higher score for women than for men), and education was revealed to have an effect on indirect relationship investments (p<.0.01) (higher score among respondents with low level of education than among respondents with high level of education). Consequently, both respondents` education level and their gender were included as covariates when analyzing effects of SMS/MMS channel additions on the mediating and dependent variables.

7.2.1 Results - SMS as channel addition

First we present the results from investigating the effects of customers` use of SMS as channel addition on the brand relationship dimensions. Next, we focus the effects on main channel use.

Effects on Brand Relationship dimensions

The effects of SMS channel additions on consumer-brand relationship dimensions are shown in table 7.2 below. These are the results of the analyses of between subject effects (i.e. does level of SMS channel addition predict the overall strength of consumer-brand relationship ties?).

Table 7.2 Effects of SMS channel addition [Between subjects]

Variable	F-value	p	SMS USAGE [MEANS] Low	High
Brand Knowledge	$F_{1,278}=3.08$	.080	4,234	4,360
Brand Satisfaction	$F_{1,278}=5.04$	.026	4,059	4,230
Quality of Alternatives	$F_{1,278}=.023$	.880	2,327	2,342
Dir. Rel. Investments	$F_{1,278}=5.00$	.026	3,009	3,263
Indir. Rel. Investments	$F_{1,278}=17.74$	.000	1,343	1,740

At first glance, these results appear promising. However, when controlling for gender, education and MMS channel addition usage, all of the significant effects above disappear (become insignificant). Hence, all positive effects of SMS channel addition usage on brand relationship ties can be explained by (interactions with) differences in scores between male and female users, levels of education and/or the respondents' MMS usage.

Tests of within-subject effects were also undertaken (i.e. does level of SMS channel addition usage explain any change in brand relationship ties between measure 1 and measure 2?). No significant within-subject effects were revealed

Effects on Main Channel Behavior

Probably, the effects of using SMS as channel addition on actual customer use of their main channel service (web) is even more interesting than the effects focused above. The effects of SMS channel additions on actual Finn main channel use are displayed in table 7.3 below.

Table 7.3 Effects of SMS channel addition [Between subjects]

Variable	F-value	p	SMS USAGE [MEANS] Low	High
Main Channel Use	$F_{1,194}=19.29$	.007	3,187	3,563

As can be clearly seen, SMS channel additions influences the use of Finn's web-based services in a positive way, indicating that this effect is not mediated through brand relationship dimensions. Controlling for gender, education and MMS channel addition use does not change this significant influence. Thus, as for Big Brother, SMS seems to be a complementary channel to the main channel of the brand (web). No significant within-subject effects are found in the Finn study.

7.2.2 Results - MMS as channel addition

We first present the results from investigating the effects of customers` use of MMS as channel addition on the brand relationship dimensions. Next, we focus the effects on main channel use.

Effects on Brand Relationship dimensions

In table 7.4, we illustrate the between subject effects of MMS channel addition on the brand relationship dimensions of Finn.

Table 7.4 Effects of MMS channel addition [Between subjects]

Variable	F-value	p	MMS USAGE [MEANS]	
			Low	High
Brand Knowledge	$F_{1,345}=1.44$	.230	4,328	4,253
Brand Satisfaction	$F_{1,345}=.048$	.826	4,104	4,119
Quality of Alternatives	$F_{1,345}=1.36$	.245	2,305	2,402
Dir. Rel. Investments	$F_{1,345}=7.14$	.008	2,953	3,215
Indir. Rel. Investments	$F_{1,345}=27.14$	.000	1,352	1,757

The results show that MMS as a channel addition has a positive effect on both direct and indirect relationship investments. The results in table 7.4 are robust even when controlling for gender, education and SMS channel addition usage. The significant effects for direct and indirect relationship investments do not change when these three covariates are introduced in the model. As for SMS use, no significant within-subject effects are observed from MMS channel addition.

Effects on Main Channel Behavior

The effects on Finn main channel usage of MMS channel additions are displayed below in table 7.5.

Table 7.5 Effects of MMS channel addition [Between subjects]

			MMS USAGE [MEANS]	
Variable	**F-value**	**p**	**Low**	**High**
Main Channel Use	$F_{1,362}=11.09$	.037	3,223	3,470

Although the effect is not very strong, it is significant at the $p>.05$ level. MMS channel additions significantly contributes to increasing the traffic at the Finn website. However, when controlling for the education level, gender and SMS usage of respondents, this effect vanishes.

Again, no significant within-subject effects are observed.

7.3 Results Finn - effects of mediating variables

The indicators applied in the measurement model are the same as in the analyses of variance presented above except for the two independent variables SMS use and MMS use which was maintained as the original ordinal variables in the path analyses. In this study, the time frame was set to 14 days between the pretest measures of the independent variables and the posttest of the dependent variable indicators.

Confirmatory factor analysis of the all indicators was reported in section 7.1. From this analysis we conclude that the discriminant and convergence validity of the constructs used in the measurement model are acceptable but that further analysis is required.

According to Agarwal and Karahanna (2000), all constructs should share more variance with their indicators than with other than with other constructs. This is shown in table 7.6 along with results for the composite reliabilities of each construct calculated as recommended by Hair et al. (1998).

Table 7.6. Inter-construct correlations and composite reliability

	Composite reliability	SMS use	MMS use	Brand know.	Brand sat.	Quality of alt.	Direct inv.	Indirect inv.	Main channel use
SMS use	0,85	0,79							
MMS use	0,88	0,63	0,84						
Brand Knowledge	0,74	0,09	-0,02	0,70					
Brand satisfaction	0,92	0,15	0,01	0,69	0,89				
Quality of alt.	0,79	0,05	0,11	-0,28	-0,30	0,78			
Direct investments	0,81	0,21	0,16	0,47	0,56	-0,13	0,76		
Indirect investments	0,93	0,39	0,38	0,18	0,18	0,12	0,55	0,90	
Main channel use	0,90	0,13	0,03	0,24	0,29	-0,12	0,53	0,24	0,90

From table 7.6 we see that the composite reliabilities are above the recommended level of 0.5 suggested by Hair et al. (1998). We also see that the average variances shared between constructs and their indicators, shown along the diagonal of the table, are larger than the corresponding inter-construct correlations. The final test of the measurement model is the estimation of measurement model fit. The measurement model was estimated using Amos 4.01 and the fit results are $\chi2/df=2.065$, RFI=0.98, CFI=0.99 and RMSEA= 0.05. These results indicate very good fit of the measurement model, and thus, we now conclude that our constructs have been measured using sufficiently reliable and valid scales.

Next, we estimated the basic model presented in figure 4.2. This model provides the frame of reference for evaluating model fit and explained variances. The model is shown in figure 7.1.

Brand knowledge

Brand satisfaction

Quality of alternatives

Direct investments

Indirect investments

-0.02

-0.02

-0.05

0.58**

-0.07

Main channel use
28.1%

χ2/df=2.064
RFI=0.98
CFI=0.99
RMSEA= 0.054
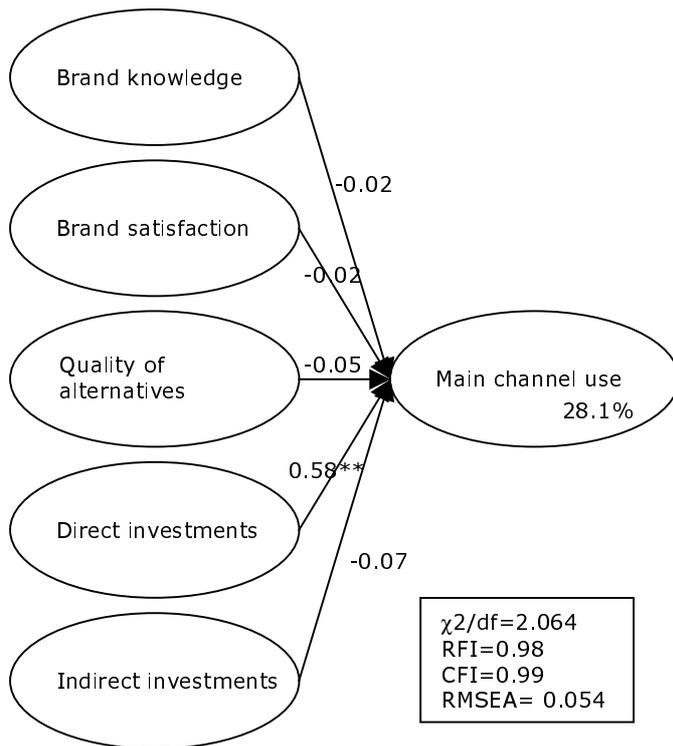
Figure 7.1. The basic model (** indicates significance at p<0.01)

From figure 7.1 we see that the basic model shows good fit when evaluated by absolute and parsimony adjusted fit indexes. However, the model explains only 28.1 % of the variance in main channel use. This is a good model with acceptable fit but the explained variance is considerably smaller than in the Big Brother study. We also see that the only significant path in the model is the relationship between direct relationship investments and main channel use. Thus, we conclude that commitment to using Finn is mainly explained by perceived direct relationship investments.

We have already investigated the relationship between SMS and MMS use and the five mediating variables of the basic model. We have also investigated the direct effect of SMS and MMS use on main channel use. Thus, to investigate if the addition of SMS and MMS use contributes to an increase in the explained variance in main channel use when compared to the basic model, the path

models were estimated for SMS and MMS services respectively. In figure 7.2 the model adding SMS use is illustrated.
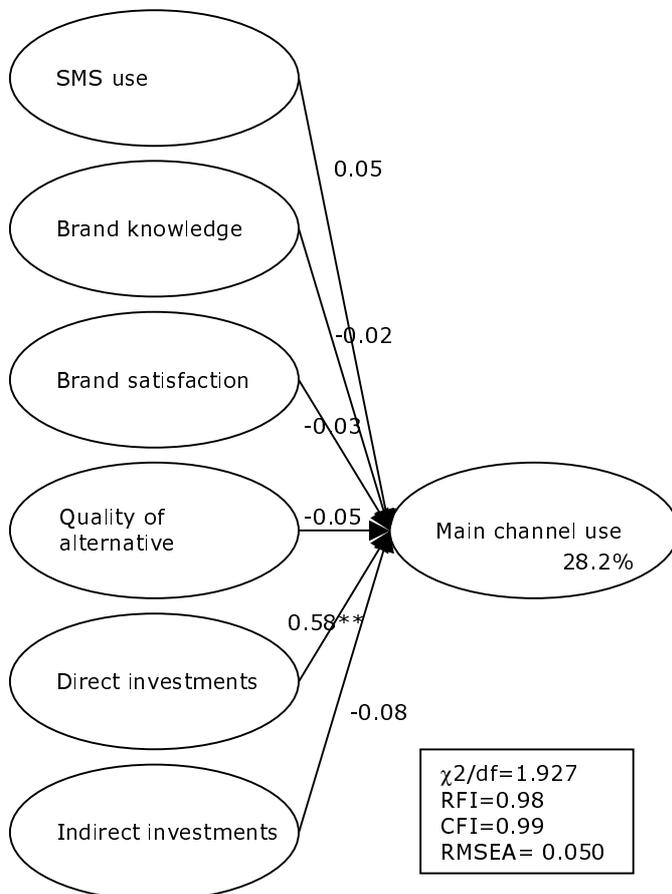
Figure 7.2. Path model of SMS service use (** indicates significance at p<0.01)

From figure 7.2 we see that the model fits the data well and that the model explains 28.2 % of the variance in main channel use. Thus, the fit is somewhat better than for the basic model when evaluated by parsimony adjusted fit indexes as well, but the model shows no increase in explained variance in main channel use. Neither was the influence of SMS use on main channel use found significant.

To assess if SMS use moderates the influence of the constructs in the basic model, we conducted five hierarchical regression analyses of the main effects and interaction effects of the constructs and SMS use on main channel use. The results are shown in table 7.7.

Table 7.7. Hierarchical regression illustrating moderating effects of SMS use

Independent variables	d.f.	R^2	ΔR^2	B	SE B	β
Brand knowledge	356	3.2	-	0.36	0.10	0.18**
Brand knowledge	350	4.8	1.6	0.33	0.10	0.17**
SMS use				0.18	0.08	0.12**
Brand knowledge	349	5.7	0.9	0.74	0.24	0.37**
SMS use				1.28	0.60	0.89**
Interaction term				-0.25	0.13	-0.82
Brand satisfaction	356	6.8	-	0.46	0.09	0.26**
Brand satisfaction	350	8.1	1.3	0.43	0.09	0.25**
SMS use				0.16	0.08	0.11**
Brand satisfaction	349	8.8	0.7	0.75	0.22	0.42**
SMS use				0.96	0.50	0.66
Interaction term				-0.18	0.11	-0.61
Quality of alternatives	355	0.5	-	-0.10	0.07	-0.07
Quality of alternatives	349	2.8	2.3	-0.11	0.07	-0.08
SMS use				0.22	0.08	0.15**
Quality of alternatives	348	2.9	0.1	-0.06	-0.06	-0.04
SMS use				0.28	0.28	0.19
Interaction term				-0.03	-0.03	-0.06
Direct investments	355	16.5	-	0.50	0.06	0.41**
Direct investments	349	17.2	0.7	0.49	0.06	0.40**
SMS use				0.10	0.07	0.07
Direct investments	348	17.4	0.2	0.61	0.14	0.49**
SMS use				0.32	0.26	0.22
Interaction term				-0.06	0.07	-0.20
Indirect investments	354	4.0	-	0.29	0.08	0.20**
Indirect investments	348	4.7	0.7	0.24	0.08	0.17**
SMS use				0.13	0.08	0.09
Indirect investments	347	6.8	2.1	0.64	0.16	0.44**
SMS use				0.46	0.14	0.32**
Interaction term				-0.17	0.06	-0.44**

(** and * indicate significance at p<0.01 and p<0.05, respectively)

From table 7.7 we again see the problems with using regression analyses due to high correlations of latent constructs. Still, as a test of the moderating effect of SMS use it is suitable. We see a main effect of SMS use for some of the

constructs, but this was not found significant in the path model. Only for indirect investments can we identify a significant interaction effect. To further investigate if this effect is consistent in the complete path model we investigated the effect of adding this term to the model including all mediating variables. This analysis revealed that there is an interaction effect of SMS use and indirect relationship investments on main channel use. Adding the term increased the explained variance of main channel use by 1.4 % and the effect was significant at the 5 % level. Most interesting with this finding is that the interaction effect is negative. Thus, SMS use moderates the effects of indirect relationship investments on main channel use by reducing its influence. This may be interpreted as if SMS use in this case partly replaces the effects of other indirect investments made in brand relationships on main channel use.

In figure 7.3 a similar estimation of the model adding MMS use as the independent variable is shown.
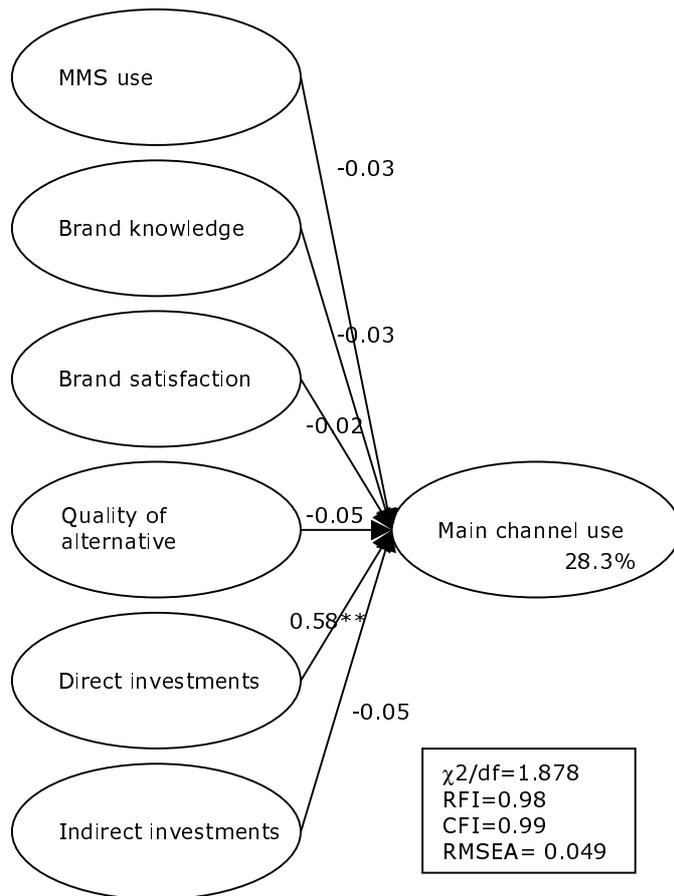
Figure 7.3. Path model of MMS service use (** indicates significance at p<0.01)

From figure 7.3 we naturally find that the model of MMS use is very similar to the SMS model. The model fits the data well and explains a similar proportion of the variances in main channel use. The significant path coefficient from the basic model is found here as well, but as for SMS use, MMS use does not seem to have a main effect on main channel use.

To investigate any moderating effects of MMS we again applied hierarchical regression analysis in the same way as for SMS use. For MMS use we identified a negative interaction effect of indirect relationship investments in the same way as for SMS use. The interaction effect was also tested in a hierarchical regression analysis including all main effects. In this model, adding the

interaction term increased the explained variance in main channel use by 0.9 %, and the effect was significant at the 5 % level as for SMS use. Thus, MMS use has no main effect in the model but it has a moderating effect on the relationship between indirect investments and main channel use.

When comparing the basic model and the models of SMS use and MMS use, we see that including SMS and MMS use in the model does not contribute to a significant increase in fit. SMS and MMS use increase explained variance in main channel use by only 0.1 and 0.2 %, and no significant main effects of these two constructs were identified. A moderating effect of SMS and MMS use and indirect investments was found on main channel use.

7.4 Conclusions – Finn

The results revealed main effects of SMS channel addition on brand satisfaction, direct relationship investments and indirect relationship investments. However, when controlling for alternative explanations, these effects disappeared, and we cannot conclude that SMS channel addition has any effect on brand relationship ties. The effect of SMS use on main channel use was, however, more robust, and the effect remained significant even after the inclusion of the control variables. MMS use was found to have an effect on both direct and indirect relationship investment. An effect of MMS as channel addition was also revealed for main channel use, but this effect vanished when control variables were included in the analysis. Thus, for between-subjects effects, we conclude that SMS use influences main channel use and that MMS use influences direct and indirect relationship investments. No significant within-subject effects were revealed neither for SMS or MMS.

Analyses based on structural equation modeling revealed a main effect of direct relationship investments on main channel use only. SMS and MMS use showed

no direct effects on main channel use. However, interaction effects of SMS and MMS use and indirect relationship investments on main channel use were found. However, the interaction effects were both negative, indicating that the effect of indirect relationship investments on main channel use decreases when use of SMS and MMS increases.

8 RESULTS – DROP STUDY

A general discussion of the measures and measure reliabilities for the three studies were reported in the methodology section. However, before we present the results of the Drop study, further analyses of the validity of the measures used in the Drop study are reported. We also report analyses of the reliability and validity of the measurement model applying the same procedures as in the two studies reported above.

8.1 Validity

To test the measurement model, confirmatory factor analysis was first applied using traditional principal components analysis with varimax rotation. The results of the analysis are shown in table 8.1.

Table 8.1. Confirmatory factor analysis for the Drop study (factor loadings below 0.35 not shown)

Item/Factor	1	2	3	4	5	6	7	8
SMS-use 1				0.81				
SMS-use 2				0.86				
SMS-use 3				0.74				
MMS-use 1		0.93						
MMS-use 2		0.91						
MMS-use 3		0.77		0.41				
Brand knowledge 1					0.84			
Brand knowledge 2			0.38		0.68			
Brand knowledge 3					0.70			
Brand satisfaction 1			0.83					
Brand satisfaction 2			0.85					
Brand satisfaction 3			0.82					
Quality of alt. 1								0.89
Quality of alt. 2								0.70
Direct investments 1					0.37	0.65		
Direct investments 2	0.40					0.75		
Direct investments 3						0.63	0.37	
Indirect investments 1	0.87							
Indirect investments 2	0.85							
Indirect investments 3	0.85							
Main channel use 1							0.83	
Main channel use 2							0.81	
Eigenvalues	7.45	3.24	1.94	1.29	1.15	0.98	0.93	0.77
Explained variance	33.86	14.74	8.81	5.88	5.23	4.45	4.22	3.51

From table 8.1 we see that the pattern of factor loadings is as expected. The second indicator of brand knowledge and the first and third indicators of direct investments have somewhat lower convergence and discriminant validity. However, when removing the brand knowledge item from the scale, reliability suffers by Cronbach's α being reduced from 0.70 to 0.55. When eliminating the first direct investment item, reliability again suffers by Cronbach's α being reduced from 0.80 to 0.75 and when removing the third indicator, Cronbach's α is reduced from from 0.80 to 0.68. Thus, we choose to retain the items in the scales. The third item on the MMS use scale has somewhat low discriminant validity. When removing the third item on both the SMS and MMS use measures, reliability as well as validity is improved. However, to enable comparison of results across the three services investigated (and other arguments

presented in section 7.1), the measures of the constructs were kept as shown in table 8.1.

8.2 Results Drop - effects of SMS/MMS

Education has a significant effect on satisfaction (p<0.01), quality of alternatives (p<0.01), direct relationship investments (p<0.01) and indirect relationship investments (p<0.01) (higher score among respondents with low level of education than among respondents with high level of education - opposite direction for quality of alternatives), whereas gender has a significant effect on brand knowledge (p<0.05) and direct relationship investments (p<0.01) (higher score among women than among men). Age and operator does not significantly influence the five relationship dimensions or the dependent variable. Consequently, we chose to control for education and gender in the analyses of variance applied to test the propositions of section 4.

8.2.1 Results - SMS as channel addition

We first present the results from investigating the effects of customers` use of SMS as channel addition on the brand relationship dimensions. Next, the effects on main channel use are presented.

Effects on Brand Relationship dimensions

The results of the GLM repeated measures analysis of the effects of SMS channel addition on brand relationship ties are displayed in table 8.2 below.

Table 8.2 Effects of SMS channel addition [Between subjects]

			SMS USAGE [MEANS]	
Variable	**F-value**	**p**	**Low**	**High**
Brand Knowledge	$F_{1,203}=14.25$	.000	3,685	4,036
Brand Satisfaction	$F_{1,203}=11.15$	.001	3,611	3,962
Quality of Alternatives	$F_{1,203}=1.15$	.284	3,226	3,135
Dir. Rel. Investments	$F_{1,203}=15.37$	.000	3,118	3,450
Indir. Rel. Investments	$F_{1,203}=25.94$	.000	1,598	2,156

When inspecting table 8.2, we clearly see that SMS channel additions positively influences all relationship dimensions but quality of alternatives. When controlling for gender, education and MMS use, the level of significance remains largely unchanged, indicating that the findings are robust and the displayed effects are independent from these covariates.

In addition to these between-subject effects, within-subject effects of SMS on indirect relationship investments and brand satisfaction were found as well. The results are presented in figure 8.1.
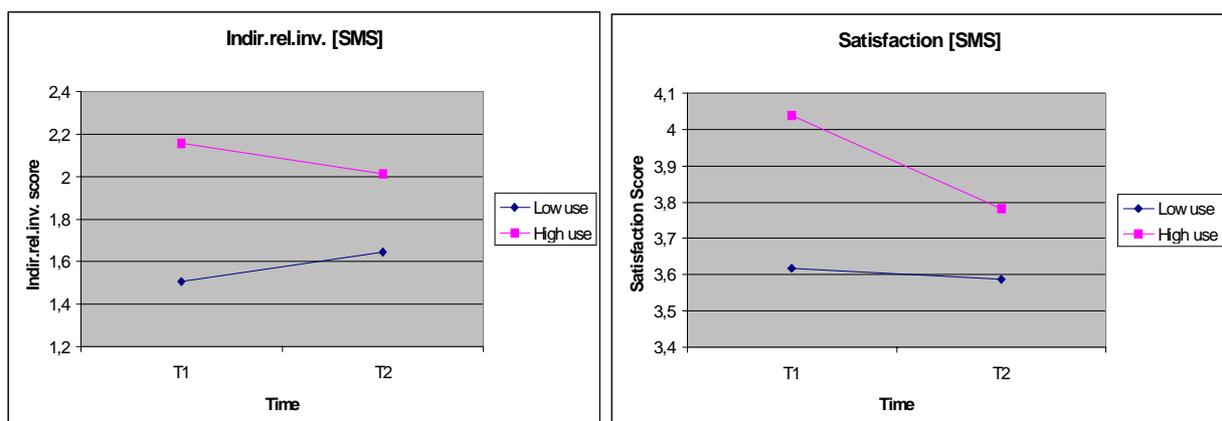
$F_{1,203} = 4.864$ (p = 0.029) $F_{1,203} = 4.710$ (p = 0.031)

Figure 8.1 Within-subject effects of SMS on indirect relationship investments and brand satisfaction.

The results reflect the same pattern as that revealed for direct relationship investments in the Big Brother study. Indirect relationship investments and brand satisfaction actually decrease among the customers using the brand's SMS services most extensively during the 14 days period between the pre-study and the post-study. The relationship ties of these customers changes more negatively than that of the customers using the brands MMS channel addition less extensively. Surprisingly, the result is in the opposite direction of what was expected.

Effects on Main Channel Behavior

The effect of SMS channel additions on actual usage of TV2's main channel is shown in table 8.3 below.

Table 8.3. Effects of SMS channel addition [Between subjects]

Variable	F-value	p	SMS USAGE [MEANS]	
			Low	High
Main Channel Use	$F_{1,218}=28.60$	.000	3,182	4,118

As can be seen from table 8.3, consumers using SMS channel additions have a significant higher use of the main channel as well. This observation still holds when we control for users gender, education and MMS use. Again, we can conclude that SMS is a complementary channel to the brands' main channel. When investigating the change in main channel use between pre-test and post-test, no within-subject effects were observed.

8.2.2 Results - MMS as channel addition

We first present the results of investigating the effects of customers` use of MMS as channel addition on the brand relationship dimensions. Next, we focus the effects on main channel use.

Effects on Brand Relationship dimensions

The effects of MMS channel additions on brand relationship dimensions are displayed in table 8.4.

Table 8.4. Effects of MMS channel addition [Between subjects]

Variable	F-value	p	MMS USAGE [MEANS]	
			Low	High
Brand Knowledge	$F_{1,203}=9.80$	.002	3,691	3,989
Brand Satisfaction	$F_{1,203}=4.87$	.028	3,663	3,880
Quality of Alternatives	$F_{1,203}=.147$	.702	3,181	3,228
Dir. Rel. Investments	$F_{1,203}=3.27$	.072	3,227	3,439
Indir. Rel. Investments	$F_{1,203}=11.09$	.001	1,690	2,079

Table 8.4 shows us that significant effects exist on three out of five relationship dimensions. Still, when introducing gender, education and SMS usage to the model, all significant effects are offset.

A within-subject effect was revealed for MMS on indirect relationship investment during the period of two weeks between the pre-study and the post-study ($F_{1,203} = 4.868$, $p <0.05$). The effect is illustrated in figure 8.2.
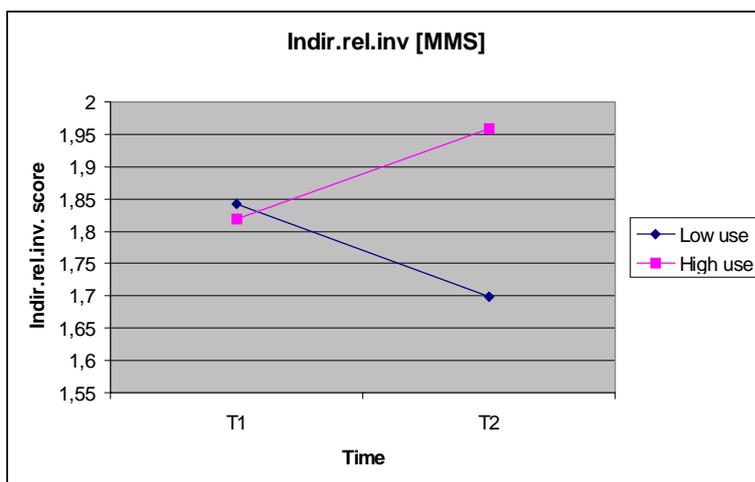
Figure 8.2. Within-subject effects of MMS on indirect relationship investments.

The result shows that perceived indirect relationship investments increases during the period among the heavy users of the brand's MMS services. Figure

8.2 also illustrate that the change in indirect relationship investments is more positive among the heavy users of the brand's MMS services than among the light users of the MMS services. This result supports the expectation that MMS use increases brand relationship ties.

Effects on Main Channel Behavior

The effect of MMS as a channel addition on actual use of the main channel is reported in table 8.5.

Table 8.5. Effects of MMS channel addition [Between subjects]

			MMS USAGE [MEANS]	
Variable	**F-value**	**p**	**Low**	**High**
Main Channel Use	$F_{1,362}=11.09$	.037	3,223	3,470

The effect of MMS use on main channel use is significant and positive. However, this effect can be attributed in full to gender, education and SMS usage differences among respondents. No within-subject effects were revealed from MMS use on main channel use.

8.3 Results Drop - effects of mediating variables

The indicators applied in the measurement model are the same as in the analyses of variance presented above except for the two independent variables SMS use and MMS use which again was maintained as the original ordinal variables in the path analyses. In this study, the time frame was set to 14 days between the pre-test measures of the independent variables and the post-test of the dependent variable indicators.

Confirmatory factor analysis of all indicators applied in the study was reported in section 8.1. From this analysis conclude that the discriminant and

convergence validity of the concepts used in the measurement model are acceptable but that further analysis is required.

According to Agarwal and Karahanna (2000), all constructs should share more variance with their indicators than with other than with other constructs. This is shown in table 8.6 along with results for the composite reliabilities of each construct calculated as recommended by Hair et al. (1998).

Table 8.6. Inter-construct correlations and composite reliability

	Composite reliability	SMS use	MMS use	Brand know.	Brand sat.	Quality of alt.	Direct inv.	Indirect inv.	Main channel use
SMS use	0,90	0,86							
MMS use	0,93	0,61	0,90						
Brand Knowledge	0,72	0,22	0,21	0,67					
Brand satisfaction	0,90	0,27	0,18	0,64	0,86				
Quality of alt.	0,63	-0,05	0,03	-0,41	-0,58	0,66			
Direct investments	0,81	0,32	0,23	0,57	0,58	-0,44	0,76		
Indirect investments	0,91	0,35	0,19	0,32	0,37	-0,18	0,69	0,88	
Main channel use	0,77	0,43	0,25	0,41	0,45	-0,31	0,66	0,51	0,79

From table 8.6 we see that the composite reliabilities are above the recommended level of 0.5 suggested by Hair et al. (1998). We also see that the average variances shared between constructs and their indicators, shown along the diagonal of the table, are larger than the corresponding inter-construct correlations. The final test of the measurement model is the estimation of measurement model fit. The measurement model was estimated using Amos 4.01 and the fit results are $\chi2/df=1.63$, RFI=0.97, CFI=0.99 and RMSEA= 0.05.

These results indicate very good fit of the measurement model, and thus, we now conclude that our constructs have been measured using sufficiently reliable and valid scales.

Next, we estimated the basic model. This model provides the frame of reference for evaluating model fit and explained variances. The model is shown in figure 8.3.
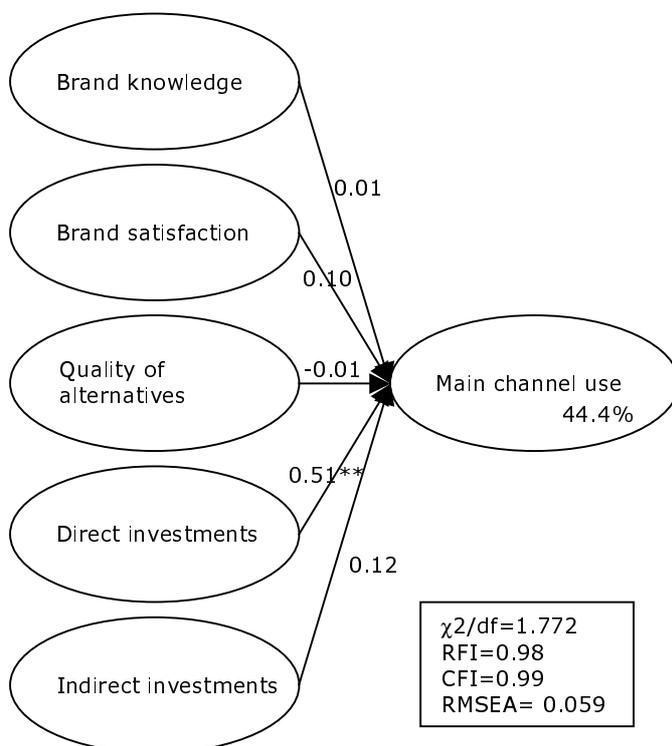
Figure 8.3. The basic model (** indicates significance at p<0.01)

From figure 8.3 we see that the basic model shows good fit when evaluated by absolute and parsimony adjusted fit indexes. The model explains 44.4 % of the variance in main channel use. This is a good model with acceptable fit, and the explanatory power is somewhat less than for the Big Brother study but considerably better than that of the Finn study. We also see that, consistent with the results of the Finn study, the only significant path in the model is the

relationship between direct relationship investments and main channel use. Thus, we conclude that commitment to using the Drop services is mainly explained by perceived direct relationship investments.

We have already investigated the relationship between SMS and MMS use and the five mediating variables of the basic model. We have also investigated the direct effect of SMS and MMS use on main channel use. Thus, to investigate if the addition of SMS and MMS use contributes to an increase in the explained variance in main channel use when compared to the basic model, the path models were estimated for SMS and MMS services respectively. In figure 8.4 the model adding SMS use is shown.
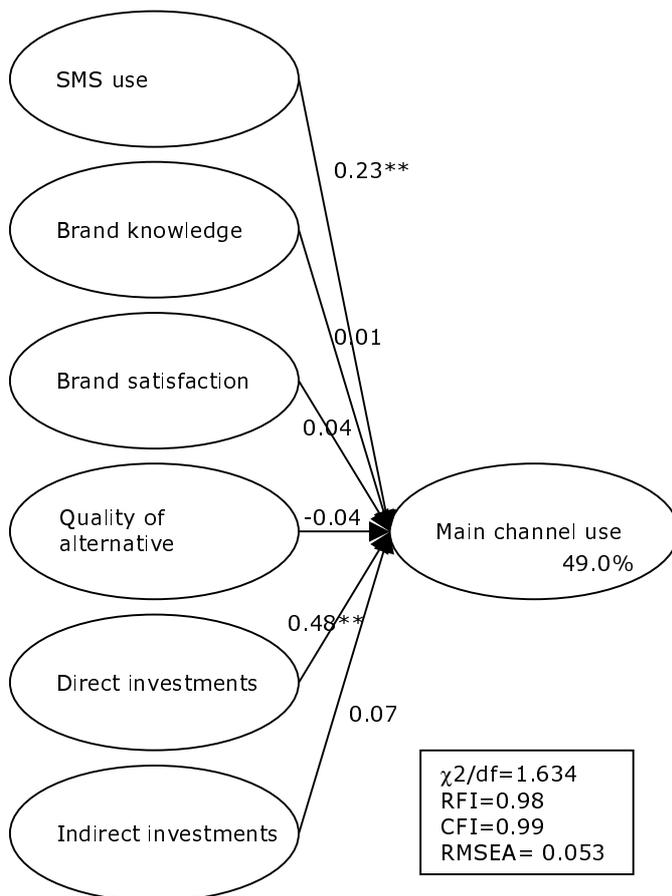
Figure 8.4. Path model of SMS service use (** indicates significance at the 1 % level)

From figure 8.4 we see that the model fits the data well and that the model explains 49 % of the variance in main channel use. Thus, the fit is somewhat better than for the basic model when evaluated by parsimony adjusted fit indexes as well, and he model also shows an increase in the explained variance of main channel use of 4.6 %. We also now see that as opposed to the Finn study and consistent with the Big Brother study, SMS use has a main effect on main channel use.

To assess if SMS use moderates the influence of the constructs in the basic model or if there are direct effects only, we conducted five hierarchical regression analyses of the main effects and interaction effects of the constructs and SMS use on main channel use. The results are shown in table 8.7.

Table 8.7. Hierarchical regression illustrating moderating effects of SMS use.

Independent variables	d.f.	R^2	ΔR^2	B	SE B	β
Brand knowledge	217	8.3	-	0.56	0.13	0.29**
Brand knowledge	210	21.2	12.9	0,46	0,12	0,23**
SMS use				0,48	0,09	0,34**
Brand knowledge	209	21.3	0.1	0,35	0,29	0,18
SMS use				0,27	0,49	0,19
Interaction term				0,05	0,12	0,18
Brand satisfaction	216	12.2	-	0.67	0.12	0.35**
Brand satisfaction	209	22.3	10.1	0,55	0,12	0,29**
SMS use				0,41	0,09	0,30**
Brand satisfaction	208	22.3	0.0	0,64	0,30	0,33*
SMS use				0,56	0,43	0,41
Interaction term				-0,04	0,11	-0,13
Quality of alternatives	218	6.2	-	0.40	0.11	0.25**
Quality of alternatives	211	19.3	13.1	-0,35	0,10	-0,22
SMS use				0,50	0,08	0,37
Quality of alternatives	210	19.3	0.0	-0,41	0,23	-0,26
SMS use				0,42	0,30	0,31
Interaction term				0,03	0,09	0,07
Direct investments	218	24.7	-	0.79	0.09	0.50**
Direct investments	211	30.5	5.8	0,66	0,09	0,42**
SMS use				0,36	0,08	0,26**
Direct investments	210	31.7	1.2	0,74	0,12	0,47**
SMS use				0,45	0,10	0,33**
Interaction term				-0,03	0,02	-0,11
Indirect investments	218	17.8	-	0.65	0.09	0.42**
Indirect investments	211	23.5	5.7	0,50	0,10	0,32**
SMS use				0,38	0,09	0,28**
Indirect investments	210	26.7	3.2	1,17	0,26	0,74**
SMS use				0,80	0,17	0,58**
Interaction term				-0,24	0,09	-0,62**

(** and * indicate significance at p<0.01 and p<0.05, respectively)

From table 8.7 we again see the problems with using regression analyses due to high correlations of latent constructs. Still, as a test of the moderating effect of SMS use it is suitable. We find a main effect of SMS use for all the constructs. For indirect investments, we identify a significant interaction effect as well. This interaction effect is negative. Thus, SMS use moderates the effect of indirect relationship investments on main channel use by reducing its influence. This may be interpreted as if the main effect of SMS use in this case replaces the effects of other indirect investments made in brand relationships on main

channel use. To further investigate if the interaction effect is consistent in the complete path model, we investigate the effect of adding this term to the model including all mediating variables. This analysis revealed that the interaction effect adds 2.4 % in explained variance to main channel use, and the interaction effect is significant at the 1 % level. The model includes two main effects of direct investments and SMS use as well as the negative interaction effect between indirect investments and SMS use. Thus, SMS use seems consistently to moderate the influence of indirect relationships investments on main channel use.

In figure 8.5, a similar estimation of the model adding MMS use as the independent variable is shown.
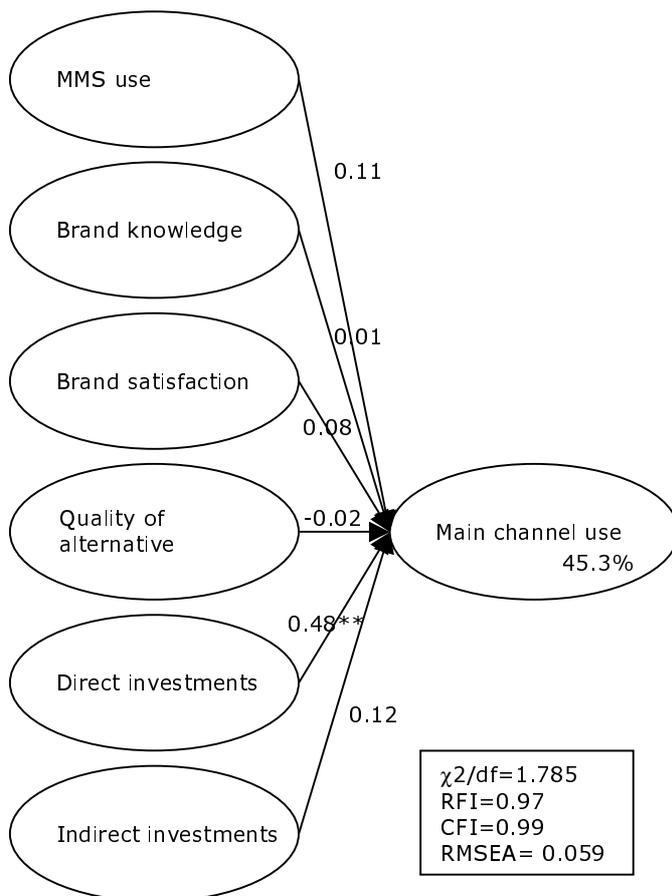
Figure 8.5. Path model of MMS service use (** indicates significance at p<0.01)

From figure 8.5 we naturally find that the model of MMS use is similar to the SMS model. The model fits the data well and explains a similar, but somewhat smaller proportion of the variance in main channel use. The significant path coefficient from the basic model is found here as well, but unlike SMS use, MMS use does not seem to have a main effect on main channel use.

To investigate any moderating effects of MMS use we used hierarchical regression analysis in the same way as for SMS use. The results for the constructs with significant interaction terms are shown in table 8.8.

Table 8.8. Hierarchical regression showing significant interaction terms

Independent variables	d.f.	R^2	ΔR^2	B	SE B	β
Direct investments	218	24.7	-	0.79	0.09	0.50**
Direct investments	210	26.8	2.1	0,74	0,10	0,47**
SMS use				0,15	0,06	0,14*
Direct investments	209	28.8	2.0	1,20	0,21	0,76**
SMS use				0,71	0,24	0,67**
Interaction term				-0,16	0,07	-0,67*
Indirect investments	218	17.8	-	0.65	0.09	0.42**
Indirect investments	210	20.2	2.4	0,59	0,10	0,39**
SMS use				0,17	0,07	0,16**
Indirect investments	209	23.8	3.6	1,34	0,25	0,87**
SMS use				0,59	0,15	0,56**
Interaction term				-0,23	0,07	-0,71**

(** and * indicate significance at p<0.01 and p<0.05, respectively)

For MMS use we identified negative interaction effects for both direct and indirect relationship investments. The interaction effects were also tested in hierarchical regression analyses including all main effects adding only the interaction terms. In these models, adding the interaction term for direct investments increased the explained variance in main channel use by 2.1 % and the effect was significant at the 5 % level. For the interaction term of indirect

investments and MMS use, explained variance was increased by 2.9 % and the effect was significant at the 1 % level. Thus, MMS use has no main effect in the model but has a moderating effect on the relationship between direct and indirect relationship investments and main channel use. As for SMS use, this interaction effect is negative indicating a moderating role of MMS use on the effect of direct and indirect relationship investments on main channel use. Again this shows that MMS use is considered an investment in the relationship with the main channel that partly replaces the effects of other relationship investments. If this reflects a boundary in the maximum perceived relationship investments that customers feel they can make remains an open question.

When comparing the basic model and the models of SMS use and MMS use, we see that including SMS use in the model contributes both to a main effect and a moderating effect. For MMS use, no main effect was revealed in the path model, but strong interaction effects were revealed for both direct and indirect relationship investments and MMS use on main channel use.

8.4 Conclusions - Drop

The results indicate between-subjects effects of SMS as channel addition on brand knowledge, brand satisfaction, indirect relationship investments, direct relationship investments, and use of TV2's main channel (TV). These effects are significant even when control variables are included in the analysis. However, when including control variables in the analysis, no MMS use effects remained significant. Thus, we can not conclude that MMS channel addition has any main effects on the variables included in this study.

Within-subject effects were found for SMS on brand satisfaction and on indirect relationship investments. However, the results were in the opposite direction of

what was predicted. Also, MMS effects (in the expected direction) were found for indirect relationship investments.

Analysis based on structural equation modeling revealed main effects of direct relationship investments and use of SMS. Interaction effects of SMS use and indirect relationship investments were also revealed. In addition, interaction effects of MMS use and both indirect relationship investments and direct relationship investments on main channel use were found. However, all the observed interaction effects were negative, indicating that the effect of indirect relationship investments on main channel use decrease when use of SMS and MMS increase and that the effect of direct relationship investments on main channel use decrease when use of MMS increase.

9 CONCLUSIONS AND DISCUSSION

This report has focused on effects of SMS and MMS as channel addition for three services. Effects have been reported for relationship ties (brand knowledge, brand satisfaction, quality of alternatives, direct relationship investments, and indirect relationship investments) and for actual use of the brands' main channels. Effects of using SMS/MMS as channel addition are reported as both between-subjects and within-subject (12/14 days period) effects.

9.1 Summary of results

The results for between-subjects effects and within-subject effects are summarized in table 9.1 and 9.2 and discussed in section 9.1.1 and 9.1.2.

9.1.1 Effects of SMS/MMS on mediating variables

These analyses were undertaken by two versions of analysis of variance. First we sum up the results from the between-subjects investigations. Next, the within-subject results are presented.

Between-subjects effects

The results presented in table 9.1 gives a summary of the results of the between-subjects effects revealed for the three services. These results are based upon the analyses of variance presented in sections 6-8.

Table 9.1 Summary of between-subjects effects

	Big Brother		Finn		Drop	
	SMS	MMS	SMS MMS		SMS	MMS
Brand knowledge	NS	NS	NS	NS	Sign	NS
Brand satisfaction	Sign	Sign	NS	NS	Sign	NS
Quality of alternatives	Sign	NS	NS	NS	NS	NS
Dir relationship invest	Sign	Sign	NS	Sign	Sign	NS
Indir relationship invest	Sign	Sign	NS	Sign	Sign	NS
Use of main channel	Sign	NS	Sign	NS	Sign	NS

NS = Not significant / Sign = Significant

The results are somewhat mixed, and conclusions should be drawn carefully. However, based on the summary presented in table 9.1, two conclusions are indicated. First, currently there seems to be a stronger effects of adding SMS as en extra channel than for MMS. In particular, this seems to be the conclusion for the Drop and Big Brother studies, while this conclusion is more questionable for the Finn study where very few effects were revealed at all.

The second conclusion indicated by the summary presented in table 9.1 is that effects on brand knowledge and quality of alternatives, in general, are lower than for the other variables. In general, and across all services, we would expect the effects on brand knowledge to be weaker than for the remaining relationship dimensions. The reason for this is twofold. First, as illustrated in hierarchy-of-effects models of brand relationships (Shimp, 2000), brand knowledge is a prerequisite for brand satisfaction and perceived relationship investments. One must be aware of and know the brand before entering into a relationship with it. Since the threshold for brand knowledge is lower than for the remaining brand relationship dimensions, and thus more people knowing about a brand than

being a committed relationship with it, we would expect SMS/MMS channel use to have a stronger effect on the remaining brand relationship dimensions. Second, and related to this point, we would expect ceiling effects in questionnaire response for brands with a high degree of awareness and associations among the respondents. When brand knowledge already is high across all groups of respondents, the fixed anchors of the questionnaire scale does not allow for much increase in response due to channel addition usage. Rather, increased associations and ties with the brand would be reflected in the remaining relationship dimensions. This is supported by the fact that effects seem to be strongest for direct and indirect relationship investments.

Related to effects on brand knowledge, theories predict that information presented in various contexts is encoded in slightly different ways. Also, the dual coding theory predicts that pictures and text will be coded in different ways. Both perspectives argue that this will provide multiple retrieval cues, and thus, increase brand knowledge. Related to the variation in formats and richness in information presented in SMS and MMS, MMS should be a more effective channel addition than SMS. Results from this study reveal SMS effects on brand knowledge only for the Drop study. No effects were revealed for MMS. Thus, the results do not support the theoretical predictions of a causal effect from channel richness via multiple retrieval cues to brand knowledge.

Within-subject effects

Results of within-subject effects (i.e. does level of channel addition usage explain any change in brand relationship ties between measure 1 and measure 2?) are summarize in table 9.2. As can be seen, only a few within-subject effects were revealed.

Table 9.2. Summary of within-subject effects.

	Big Brother		Finn		Drop	
	SMS	MMS	SMS MMS		SMS	MMS
Brand knowledge	NS	NS	NS	NS	NS	NS
Brand satisfaction	NS	NS	NS	NS	Sign	NS
Quality of alternatives	NS	NS	NS	NS	NS	NS
Dir relationship invest	NS	Sign	NS	NS	NS	NS
Indir relationship invest	NS	NS	NS	NS	Sign	Sign
Use of main channel	NS	NS	NS	NS	NS	NS

NS = Not significant / Sign = Significant

The results show that within effects of SMS were found for direct relationship investment in the Big Brother study and for brand satisfaction and indirect relationship investments in the Drop study. Within-subject effects were revealed for MMS on indirect relationship investments in the Drop study. Consequently, within-subject effects are very rare in the studies presented in this report. It should also be noticed that only the within-subjects effects of MMS on indirect relationship investments observed in the Drop study was in the expected direction. Overall, there was a decrease in respondents' evaluation of the relational measures during the 12/14 days period of the studies. According to the propositions, this reduction should have been lower among the heavy users of SMS/MMS channel addition services than among the other respondents. No other within-subject effect than the MMS effect on indirect relationship investments (in the Drop study) supported the propositions.

Only marginal within-subject effects were revealed. This finding is not very surprising and can be attributed to two primary causes. First, the time between measure 1 and 2 is quite short. A period of two weeks is not a very long time for

respondents to strengthen brand relationships considering the total amount of time that has been available for getting to know the brand. Second, most respondents have already established (mature) relationships with the brands studied through other channels. The incremental increase in brand relationships attributable to SMS/MMS channel additions in this two week period would most likely be rather marginal. Third, since measure 1 was conducted after most respondents had started using the channel addition service, we may expect most of the effects of the channel addition use on brand relationships to have already materialized. Consequently, the abovementioned between-subject analysis is a more realistic and appropriate test of the proposed effects than the within-subject analysis.

9.1.2 Effects of mediating variables on main channel use

While the effects presented in table 9.1 and 9.2 focus effects of SMS/MMS use on the mediating and dependent variables, results presented in table 9.3 focuses the effects of the mediating (and independent) variables on the dependent variable (main channel use). These results are based upon the structural equations modeling presented in sections 6-8.

Table 9.3. Summary of effects from mediating variables on main channel use.

	Big Brother	**Finn**	**Drop**
Main effects			
Brand knowledge	NS	NS	NS
Brand satisfaction	NS	NS	NS
Quality of alternatives	Sign	NS	NS
Dir. relationship investments	Sign	Sign	Sign
Indir. relationship investments	NS	NS	NS
SMS use	Sign	NS	Sign
MMS use	NS	NS	NS
Interaction effects			
Dir. rel. inv. * SMS use	Sign	NS	NS
Indir. rel. inv. * SMS use	NS	Sign	Sign
Dir. rel. inv. * MMS use	Sign	NS	Sign
Indir. rel. inv. * MMS use	NS	Sign	Sign
Brand sat. * MMS use	Sign	NS	NS

NS = Not significant / Sign = Significant

In short, the results show that direct relationship investments are the main antecedent of main channel use. The variable has a significant effect on main channel use across all three services. In addition, we see that SMS use also has a direct effect on main channel use for the Big Brother and Drop services. In table 9.3, only the results for interaction effects found significant in at least one study are shown. A few significant interaction effects were revealed. However, the interaction effects did not show any clear pattern across the three studies. Thus, one should be careful to conclude regarding interaction effects in general.

9.2 Implications

Combining the results presented in table 9.1 and 9.3, some interesting indications are present. As can be seen, effects of SMS and MMS are strongest

on indirect relationship investments and direct relationship investments. If we combine this with the results from table 9.3, we see that effects of direct relationship investment are the single most important antecedent for main channel use. Thus, the causal chain from SMS/MMS use, via direct relationship investment, on main channel use seems to be the most promising chain for further elaboration. Following this causal chain, the strategies for companies should be to use SMS/MMS channel additions to increase direct relationship investments. This means that companies should 1) strive to build an emotional relationship with their customers by the use of SMS/MMS, 2) strive to be an important part of the customers' everyday life, and 3) strive to make their customers use their added services a lot. If this is attained, customers will increase the use of the brand's main channel.

The open questions then are 1) how can companies build an emotional relationship with their customers by the use of SMS/MMS, 2) how can the company be an important part of the customers' everyday life, and 3) how can the company make their customers use their added services a lot. The answers to these questions depend on situational factors. Two examples are the type of brand and category of customer segments using the brand. However, some general recommendations can be made. Related to the *first* point (build emotional relationships), several authors point to the fact that mobile devices are very personal (The Economist, 2001; Lot21, 2001; Andersson and Nilsson, 2000). By using the consumers' permission to offer them personalized, timely, and relevant information, the relationship is deepened (Lot21, 2001). Furthermore, two way communication help to build the relationship between the customer and the brand (Barbieri, 2002). Thus, serving the customers on a personal and individual basis, for example by sending relevant and time sensitive information to a loyalty card customer, may strengthen the emotional relationship between a brand and its customers. Related to the *second* point (be

an important part of customers life) an idea called "send me signals" was introduced by Doyle (2001). Examples of such signal are reminders sent from the brand to the customers - for example that the customer's car is due to service (Doyle, 2001) or reminders of Mother's Day the upcoming Sunday (Barwise and Strong, 2002). Through such services, the brand may help customers organize their everyday life, and thus, be an important part of the customers' life. The *third* point (make their customers use their added services a lot) reflects the information accessibility element (see table 3.1). One way to make the customers use a service a lot is to be available anytime and everywhere. This is in particular relevant for time and location based services. The brand may also offer subscription services allowing the brand to contact the customer.

Another result from table 9.1 worth mention is that the use of SMS has a direct and positive effect on the use of the brands' main channel use. The result is valid for all of the three services, while such an effect is not present for MMS for any of the three services. In chapter 2 we discussed channel complements, channel supplements and channel substitution. The result indicate that SMS channel additions are perceived as complements to the brands' main channels while the MMS services are supplements to the brands' main channels. Although the MMS services seem to be supplementary, it is argued by Riel, Liljander, and Jürrens (2001) and Anderson and Narus (1995) that supplementary services have the potential to add value to the core product. This may be the reason why we observe *some* MMS effects on the mediating variables (brand satisfaction, direct relationship investments, indirect relationship investments) without observing any effect on use of the main channel.

9.3 Discussion

This study includes three individual surveys investigating the effects of SMS/MMS as channel addition on customers' relationships with a brand and

customers' main channel use. Procedures and measures are very similar across the three studies. In general the measures used are well founded in research reviewed in section 4. Thus the construct validity should be considered acceptable. However, as discussed in sections 6.1, 7.1, and 8.1, there are some problems related to cross-loadings in the confirmatory factor analyses for SMS use and MMS use. Due to the importance of keeping the measures alike across the three studies, both SMS use and MMS use were measured by three indicators inn all of the three studies. Further refinement of the two constructs SMS use and MMS use is therefore required. Still, comprehensive analyses of the measurement models investigating convergence and discriminant validity as well as composite reliability showed god fit and acceptable indexes.

The procedure used to recruit subjects in the three studies was similar. A link to a questionnaire was presented at the website of the three brands taking part in the survey - TV2 Drop, Finn, and Big Brother. Visitors of the website had to "click" on the link to get access to the questionnaire. Thus, the recruitment was initiated by the respondents. This means that the respondents were users of the service offered on the website or that they had an explicit interest in expressing their opinions about SMS and MMS channel addition for the three brands. The recruitment method is based on self-selection of respondents. For all three surveys, sample demographics on gender, age, education, and mobile operator are reported. Sample characteristics show that the samples are not representative of the general population. However, gender and education was the only sample characteristics revealed to influence the dependent variables studied here. These variables are included as covariates in all analysis, and effects of the sample biases are commented on in each of the three studies. The size of the samples in the three surveys ranged from 226 to 374. In general, sample size should be large enough in all three studies to guarantee statistical conclusion validity. In general, internal validity of the results presented in this report is considered

acceptable. However, internal validity was limited to the constructs, measures, samples and services (brands) we have studied. Thus, conclusions regarding the effects of SMS/MMS as channel addition for TV2 are in principle limited to the users of TV2's Drop website. Conclusions regarding effects of SMS/MMS as channel addition for Finn are in principle limited to the users of Finn's website. And, conclusions regarding effects of SMS/MMS as channel addition for Big Brother are in principle limited to the users of Big Brothers' website. However, we have no indication that the samples resulting from the self-selection procedure applied differ considerably from the population of main channel users in any of the three studies.

Timing may also be an issue threatening external validity. For example, the phase of the adoption process or external events may have interacted with our service categories and subject selection methods in ways that have reduced the external validity of our results. TV2's Drop service was introduced March 8, 2003 while Finn has been available on SMS for a few years now (although the MMS services are newer). The Big Brother services were available only for a period of 68 days from March 9 to May 14. The Big Brother main channel service (and some of the channel addition services) was heavily advertised during the survey period when compared to the two other services reported. It should also be noticed that the Drop service was free during the survey period while users had to pay for the use of the two other services. Consequently, timing may have limit the external validity of the results presented here. Despite these issues threathening external validity, the findings reported as most important here have been found consistent across three service,s including services used mainly for instrumental as well as for entertainment purposes. The services also appeal to different customer segments but our findings have also proved to be fairly consistent across customer segments. Thus, we suggest that the findings revealed in this study represent a solid basis for further exploration

and investigation of the effects of mobile channel additions in commercial contexts.

The results revealed more effects of SMS than of MMS (see table 9.1). One potential explanation of this observation may be found in the adoption process of the services. SMS services are adopted among most of the customers in the populations studied. Thus, the respondents have tried SMS services many times, and they have realistic expectations about SMS services. MMS services, however, are still only used among a few customers in the population studied. Also, MMS services are still available for a narrow range of services. Thus, the expectations related to the quality of MMS services may be less realistic, and the possibility for being disappointed (disconfirmed expectations) is higher. According to theory (Yi, 1990), disconfirmed expectations about a service lead to dissatisfaction with the service. This may explain why MMS as channel addition did not seem to be as effective as SMS services. However, if this explanation is correct, MMS as channel addition should be more effective in the future as MMS services become more common.

REFERENCES

Advani, R. and Choudhury, K. (2001): Making the Most of B2C Wireless, *Business Strategy Review*, vol. 12, no. 2, pp. 39-49.

Aaker, J.L. (1997): Dimensions of Brand Personality, *Journal of Marketing Research,* vol. 34, pp. 347-356.

Agarwal, R. and Karahanna, E. (2000): Time flies when you're having fun: cognitive absorbtion and beliefs about information technology usage, *MIS Quarterly*, vol. 24, no. 4, pp. 665-694.

Alba, J., Lynch, J., Weitz, B., Janiszewski, C., Lutz, R., Sawyer, A., and Wood, S. (1997): Interactive Home Shopping: Consumer, Retailer, and Manufacturer Incentives to Participate in Electronic Marketplaces, *Journal of Marketing*, vol. 61, July, pp. 38-53.

Anderson, E., and Weitz, B. (1992): The Use of Pledges to Build and Sustain Commitment in Distribution Channels, *Journal of Marketing Research*, vol. 29, no. 1, pp. 18-34.

Andersson, A., and Nilsson, J. (2000): *Wireless Advertising Effectiveness. Evaluation of an SMS Advertising Trial*, Master`s Thesis in Marketing, Stockholm School of Economics, Stockholm

Assael, H. (1998): *Consumer Behavior and Marketing Action*. Cincinnati, Ohio: South-Western College Publishing.

Balasubramanian, S., Peterson, R. A., and Jarvenpaa, S. L. (2002): Exploring the Implications of M-Commerce for Markets and Marketing, *Journal of the Academy of Marketing Science*, vol. 30, no. 4, pp. 348-361.

Barbieri, M. (2002): SMS marketing, *Brand Strategy*, August, p. 3.

Barwise, P. (2001): TV, PC, or Mobile? Future Media for Consumer e-Commerce, *Business Strategy Review*, vol. 12, no. 1, pp. 35-42.

Barwise, P. and Strong, C. (2002): Permission-Based Mobile Advertising, *Journal of Interactive Marketing*, vol. 16, no. 1, pp. 14-24.

Belk, R.W. (1988): Possesions and the Extended Self, *Journal of Consumer Research*, vol. 15.

Berry, L.L. (1983): Relationship Marketing, *in Emerging perspectives on Services Marketing*, L.L. Berry, G.L. Shostack and G.Upah (eds.), American Marketing Association, Chicago, IL.

Berry, L.L. (1995): Relationship Marketing of Services – Growing Interest, Emerging Perspectives, *Journal of the Academy of Marketing Science*, vol. 23.

Berscheid, E. and H.T. Reis (1998): Attraction and close relationships, in *the Handbook of Social Psychology*, D.T. Gilbert, S.T. Fiske and G. Lindzey (eds.), McGraw-Hill.

Blackston, M. (1992): Observations: Building Brand Equity by Managing Brand's Relationships, *Journal of Advertising Research,* May/June, pp. 79-83.

Blackston, M. (1993): Beyond Brand Personality: Building Brand Relationships, in *Brand Equity & Advertising*, Aaker, D. and Biel, A.L. (eds.), Lawrence Erlbaum Associates, New Jersey.

Bolton, R. N., and Drew, J. H. (1991): A Multistage Model of Customers` Assessment of Service Quality and Value, *Journal of Consumer Research*, vol. 17, March, pp. 375-384.

Brehm, S.S. (1985): *Intimate Relationships*, Random House, New York

Conway, J.C. and Rubin, A.M. (1991): Psychological predictors of television viewing motivation, *Communication Research*, vol. 18, no. 4, pp. 443-463.

Cooke, M., Nielsen, A., and Strong, C. (2003): Wireless: Communication and Research Medium, *ESOMAR*, Cannes 26-28 January, France.

Cronin, J. J., and Taylor, S. A. (1992): Measuring Service Quality: A Reexamination and Extension, *Journal of Marketing*, vol. 56, July, pp. 55-68.

Crosby, L.A, Evans, K.R and Cowles, D. (1990): Relationship Quality in Services Selling: An Interpersonal Influence Perspective, *Journal of Marketing*, vol. 54.

Dorsch, M.J., Swanson, S.R and Kelley, S.W. (1998): The Role of Relationship quality in the Stratification of Vendors as Perceived by Consumers, *Journal of the Academy of Marketing Science*, vol. 26, no. 2.

Doyle, S. (2001): Software review: Using short message services as a marketing tool, *Journal of Database Marketing*, vol. 8, no. 3, pp. 273-277.

Dwyer, E. R., Schurr, P. H., and Oh, S. (1987): Developing Buyer-Seller Relationships, *Journal of Marketing*, vol. 51, pp. 11-27.

Economist (2001): *Why Mobile is Different*, http://www.economist.com/surveys

Fornell, C., Johnson, M. D., Anderson, E. W., Cha, J., and Bryant, B. E. (1996): The American Customer Satisfaction Index: Nature, Purpose, and Findings, *Journal of Marketing*, vol. 60, October, pp. 7-18.

Fournier, S. (1994): *A Consumer-Brand-Relationship Framework for Strategic Brand Management*, Dissertation, University of Florida, UMI.

Fournier, S. (1998): Consumers and their Brands: Developing Relationship Theory in Consumer Research, *Journal of Consumer Research*, vol. 24.

Fournier, S., Dobscha, S. and Mick, D.G. (1998): Preventing the Premature Death of Relationship Marketing, *Harvard Business Review.*

Fournier, S and Yao, J.L. (1999): Reviving Brand Loyalty: A Reconceptulization within the Framework of Consumer-Brand Relationships, *International Journal of Research in Marketing,* vol. 14, pp. 451-472.

Garbarino, E. and Johnson, M.S. (1999): The Different Roles of Satisfaction, Trust and Commitment in Customer Relationships, *Journal of Marketing,* vol. 63.

Geyskens, I., Gielens, K., and Dekimpe, M. G. (2002): The Market Valuation of Internet Channel Addition, *Journal of Marketing*, vol. 66, April, pp. 102-119.

Gwinner, K.P., Gremler, D.D and Bitner, M.J. (1998): Relational Benefits in Services Industries: The Customer's Perspective, *Journal of the Academy of Marketing Science*, vol. 26, no. 2.

Hair, J.F., Anderson, R.E., Tatham, R.L. and Black, W.C. (1998): *Multivariate Data Analysis*, Prentice Hall, New Jersey.

Holland, J. and Baker, S.M. (2001): Customer participation in Site Brand Loyalty, *Journal of Interactive Marketing*, 15 (4), pp. 34-45.

Jap, S.D and Ganesan, S. (2000): Control Mechanisms and the Relationship Life Cycle: Implications for Safeguarding Specific Investments and Developing Commitment, *Journal of Marketing Research,* vol. 37.

Keller, K. L. (1996): Brand Equity and Integrated Communication, in Integrated Communication: Synergy of Persuasive Voices, Thorson, E. (ed.), Lawrence Erlbaum Associates, Publishers, New Jersey, pp. 103-132.

Kelley, H.H. and Thibaut, J.W. (1978): *Interpersonal Relationships: A Theory of Interdependence*, New York: Wiley.

King, D., Lee, J., Warkentin, M., and Chung, H. M. (2002): *Electronic Commerce. A Managerial Perspective*, Prentice Hall, Pearson Education International, Upper Saddle River, New Jersey.

Klein, L. (2003): Creating Virtual Product Experiences: The Role of Telepresence, *Journal of Interactive Marketing*, vol. 17, no. 1, pp. 41-55.

Kleinschmidt, E. J., and Cooper, R. G. (1991): The Impact on Product Innovativeness on Performance, *Journal of Product Innovation Management*, vol. 8, pp. 240-251.

Kurvinen, E. (2003): *Only when Miss Universe snatches me: teasing in MMS messaging. Proc. DPPI'03*. ACM Press, Pittsburg, PE.

Lai, T. L. (2002): *Short message service (SMS): the impact of service quality and perceived value of satisfaction, intention and usage*, Working Paper, Nanyang Business School, Singapore.

Leung, L. and Wei, R. (1998): The Gratifications of Pager Use: Sociability, Information-Seeking, Entertainment, Utility, and Fashion and Status, *Telematics and Informatics,* (November), pp. 253-264.

Leung, L. and Wei, R. (2000): More Than Just Talk on the Move: Uses and Gratifications of the Cellular Phone, *Journalism & Mass Communication Quarterly*, vol. 77, no. 2, pp. 308-320.

Ling, R. (2001): The diffusion of mobile telephony among Norwegian teens: A report from after the revolution, Article presented at *ICUST* in Paris, France, June 2001.

Ling, R. (2001b): It is in. It doesn`t matter if you need it or not, just that you have it. Fashion and the Domestication of the mobile telephone among teens in Norway, Working Paper, Telenor R&D, Oslo, Norway.

Lot21 (2001): *The Future of Wireless Marketing*, Lot21 Inc., San Francisco/New York, USA.

Moorman, C., Zaltman, G., and Deshpande, R. (1992): Relationships between Providers and Users of Market Research. The Dynamics of Trust within and between Organizations, *Journal of Marketing Research*, vol. 29, pp. 314-329.

Morgan, R.M and Hunt, S.D (1994): The Commitment-Trust Theory of Relationship Marketing, *Journal of Marketing,* vol. 58, pp. 20-38.

Newell, F. and Newell Lemon, K. (2001): *Wireless Rules*, McGraw-Hill, New York.

Oliver, R. L. (1993): A Conceptual Model of Service Quality and Service Satisfaction, *Advances in Services Marketing and Management*, vol. 2, pp. 65-85.

Oliver, R.N: (1997): *Satisfaction. A Behavioral Perspective on the Consumer*, New York: MacGraw-Hill Inc.

Perse, E.M. (1996): Sensation seeking and the use of television for arousal, *Communication Reports*, vol. 9, no. 1, pp.37-49.

Reichheld, F. F., and Schefter, P. (2000): E-Loyalty. Your Secret Weapon on the Web, *Harvard Business Review*, July-August, pp. 105-85.

Riel, A. C. R., Liljander, V., and Jurriëns, P. (2001): Exploring Consumer Evaluations of E-Services: A Portal Site, *International Journal of Service Industry Management*, vol. 12, no. 4, pp. 359-377.

Rusbult, C.E. (1980): Satisfaction and Commitment in Friendships, *Representative Research in Social Psychology,* vol. 11.

Rusbult, C.E., Martz, J.M., and Agnew, C.R. (1998): The Investment Model Scale: Measuring Commitment Level, Satisfaction Level, Quality of Alternatives, and Investment Size, *Personal Relationships,* vol. 5.

Rusbult, C.E. (1987): Commitment in Close Relationships: The Investment Model, in *Readings in Social Psychology: Classic and Contemporary Contributions*, L.A. Peplau, D.O Sears, S.E. Taylor and J.L. Freedman (eds.), Englewood Cliffs, NJ: Prentice Hall.

Samu, S., Krishnan, H. S., and Smith, R. E. (1999): Using Advertising Alliances for New Product Introduction: Interactions Between Product Complementarity and Promotional Strategies, *Journal of Marketing*, vol. 63, January, pp. 57-74.

Scanzoni, J. (1979): Social Exchange and Behavioral Interdependence, in *Social Exchange in Developing Relationships*, R.L. Burgess and T.L. Huston (eds.), New York: Academic Press, Inc.

Sirgy, M.J. (1982): Self-Concept in Consumer Behavior: A Critical Review, *Journal of Consumer Research*, vol.9.

Smothers, N. (1993): Can Products and Brands Have Charisma?, in *Brand Equity & Advertising's Role in Building Strong Brands*, Aaker, D.A. and Biel, A.L (eds), Lawrence Erlbaum Associates.

SPSS (1999): SPSS Advanced Models 9.0, SPSS Inc., Chicago, IL.

Thibaut, J.W. and Kelley, H.H. (1959): *The Social Psychology of Groups*, New York: Wiley.

Sengupta, S. (1998): Some approaches to Complementary Product Strategy, *Journal of Product Innovation Management*, vol. 15, pp. 352-367.

Sheth, J.N. and Parvatiyar, A. (1995): Relationship Marketing in Consumer markets: Antecendents and Consequences, *Journal of the Academy of Marketing Science*, vol. 23, no. 4, pp. 255-271.

Shimp, T. A. (2000): *Advertising Promotion. Supplemental Aspects of Integrated Marketing Communication*, The Dryden Press, Harcourt, Orlando.

Siau, K., Lim, E.-P., and Shen, Z. (2001): Mobile Commerce: Promises, Challenges, and Research Agenda, *Journal of Database Management*, vol. 12, no. 3, pp. 4-13.

Steiner, I. (2001): *Serving up the Wireless Web*, www.onlinemag.net, September/October, pp. 26-33.

Steuer, J. (1992): Defining Virtual Reality: Dimensions of Determining Telepresence, *Journal of Communication*, vol. 42, no. 4, pp. 73-93.

Thibaut, J.W. and Kelley, H.H. (1959): *The Social Psychology of Groups*, New York: Wiley.

Thorbjørnsen, H., Breivik, E. og Supphellen, M. (2002): *Consumer-Brand Relationships: A Test of Alternative Models*, Proceedinggs of AMA's Winter Educators Conference, Austin, TX. vol.13.

Thorbjørnsen, H., Supphellen, M., Nysveen, H., and Pedersen, P. E. (2002): Building Brand Relationships Online: A Comparison of Two Interactive Applications, *Journal of Interactive Marketing*, vol. 16, no. 3, pp. 17-34.

Thorbjørnsen, H. and Breivik, E. (2002): Konsument-merke relasjoner. (Enda) et Nytt Perspektiv innen Merkevareledelse?, *Magma*, No.2, Fagbokforlaget, Bergen.

Tsui, D. (2001): *Monetizing the Wireless Marketing Opportunity*, http://www.wow-com.com/market_research/documents/Agenda01_NM4_Tsui.pdf

Unnava, H. R., and Burnkrant, R. E. (1991): An Imagery-Processing View of the Role of Pictures in Print Advertisements, *Journal of Marketing Research*, vol. 28, May, pp. 226-231.

Watson, R. T., Pitt, L. F., Berthon, P., and Zinkhan, G. M. (2002): U-Commerce: Expanding the Universe of Marketing, *Journal of the Academy of Marketing Science*, vol. 30, no. 4, pp. 333-347.

Yunos, H. M., and Gao, J. (2002): *Wireless Advertising*, Working Paper, San Jose State University, Department of Computer Engineering, http://www.engr.sjsu.edu/gaojerry/report/wireless-add-paper2.pdf

Appendix A. Sample pre-test questionnaire - Big Brother

Side **1** av 4

Konsentrer deg først om **SMS-nyhetene til BigBrother.** SMS-nyhetene gjør at du får melding når det skjer noe spennede i BB-huset.

Svar på spørsmålene ut fra dine **erfaringer**. Hvis du ikke har erfaringer vil vi likevel at du svarer på spørsmålene ut fra det du **vet** eller **tror** om **disse tjenestene**

Vennligst ta stilling til følgende utsagn om **SMS-nyhetene** til BigBrother på en **skala** fra 1 til 5 der **1 er svært uenig** og **5 er svært enig**: (Svært uenig 1 — Svært enig 5)

- Bruken av SMS-nyhetene er enkel og forståelig
- Det er lett å bruke SMS-nyhetene til BigBrother
- Jeg er svært tilfreds med SMS-nyhetene til BigBrother
- SMS-nyhetene til BigBrother tilfredstiller mine forventninger
- Jeg bruker SMS-nyhetene fra BigBrother mye
- Jeg ser på meg selv som en som bruker SMS-nyhetene fra BigBrother mye
- Jeg har tenkt å bruke SMS-nyhetene fra BigBrother hvis det starter opp igjen på nytt

- SMS-nyhetene gjør at jeg kan følge bedre med på det som skjer på BigBrother
- SMS-nyhetene er nyttige når man vil følge med på det som skjer på BigBrother
- Jeg snakker ofte med andre om SMS-nyhetene til BigBrother
- Å bruke SMS-nyhetene er en del av den måten jeg uttrykker min personlighet på
- SMS-nyhetene får meg til å bli mer interessert i å følge med på TV-programmet BigBrother
- SMS-nyhetene har lite med innholdet på TV-programmet BigBrother å gjøre
- Ting som jeg før måtte se på TV-programmet BigBrother for å få med meg kan jeg nå i stedet få med meg ved å bruke SMS-nyhetene

Vennligst besvar nå følgende spørsmål om **SMS og telefon-avstemmingen** på BigBrother:

Omtrent hvor mange ganger har du brukt SMS-avstemmingen på BigBrother siste uke?
- Ingen
- 1-2 ganger
- 3-5 ganger
- Mer enn 5 ganger

Omtrent hvor mange ganger har du brukt telefon-avstemmingen (829-nummer) på BigBrother siste uke?
- Ingen
- 1-2 ganger
- 3-5 ganger
- Mer enn 5 ganger

Vennligst ta stilling til følgende utsagn om **SMS og telefon-avstemmingen** til BigBrother på en **skala** fra 1 til 5 der **1 er svært uenig** og **5 er svært enig**: (Svært uenig 1 — Svært enig 5)

- Det er enklere å bruke SMS-avstemmingen enn telefon-avstemmingen
- SMS-avstemmingen tilfredstillier mine forventninger bedre enn telefon-avstemmingen
- Jeg har tenkt å bruke SMS-avstemmingen mer enn telefonavstemmingen hvis BigBrother starter opp igjen på nytt
- SMS-avstemmingen er mer nyttig enn telefon-avstemmingen
- Å bruke SMS-avstemmingen stemmer bedre med min personlighet enn å bruke telefon-avstemmingen
- Den reelle prisen på SMS-avstemmingen er mye høyere enn prisen på telefon-avstemmingen

Klikk på "Send" når skjemaet er utfylt og du er klar til å gå til side 2   [Send] [Nullstill]

Sidene vedlikeholdes av per.pedersen@nhh.no

SNF

Side **2** av 4

Konsentrer deg nå om **MMS-nyhetene til BigBrother.** MMS-nyhetene gjør at du får bilder og lengre meldinger som oppsummerer hva som har hendt i BB-huset.

Svar på spørsmålene ut fra dine **erfaringer**. Hvis du ikke har erfaringer vil vi likevel at du svarer på spørsmålene ut fra det du **vet** eller **tror** om **disse tjenestene.**

Vennligst ta stilling til følgende utsagn om **MMS-nyhetene** til BigBrother på en **skala** fra 1 til 5 der **1 er svært uenig** og **5 er svært enig:**	Svært uenig 1	2	3	4	Svært enig 5
Bruken av MMS-nyhetene er enkel og forståelig	○	○	○	○	○
Det er lett å bruke MMS-nyhetene til BigBrother	○	○	○	○	○
Jeg er svært tilfreds med MMS-nyhetene til BigBrother	○	○	○	○	○
MMS-nyhetene til BigBrother tilfredstiller mine forventninger	○	○	○	○	○
Jeg bruker MMS-nyhetene fra BigBrother mye	○	○	○	○	○
Jeg ser på meg selv som en som bruker MMS-nyhetene fra BigBrother mye	○	○	○	○	○
Jeg har tenkt å bruke MMS-nyhetene fra BigBrother hvis det starter opp igjen på nytt	○	○	○	○	○

	Svært uenig 1	2	3	4	Svært enig 5
MMS-nyhetene gjør at jeg kan følge bedre med på det som skjer på BigBrother	○	○	○	○	○
MMS-nyhetene er nyttige når man vil følge med på det som skjer på BigBrother	○	○	○	○	○
Jeg snakker ofte med andre om MMS-nyhetene til BigBrother	○	○	○	○	○
Å bruke MMS-nyhetene er en del av den måten jeg uttrykker min personlighet på	○	○	○	○	○
MMS-nyhetene får meg til å bli mer interessert i å følge med på TV-programmet BigBrother	○	○	○	○	○
MMS-nyhetene har lite med innholdet på TV-programmet BigBrother å gjøre	○	○	○	○	○
Ting som jeg før måtte se på TV-programmet BigBrother for å få med meg kan jeg nå i stedet få med meg ved å bruke MMS-nyhetene	○	○	○	○	○

Vennligst besvar nå følgende spørsmål om **SMS-nyhetene og MMS-nyhetene til BigBrother:**

Omtrent hvor mange ganger har du brukt/mottatt SMS-nyhetene på BigBrother siste uke?	○ Ingen ○ 1-2 ganger ○ 3-5 ganger ○ Mer enn 5 ganger
Omtrent hvor mange ganger har du brukt/mottatt MMS-nyhetene på BigBrother siste uke?	○ Ingen ○ 1-2 ganger ○ 3-5 ganger ○ Mer enn 5 ganger

Vennligst ta stilling til følgende utsagn på en **skala** fra 1 til 5 der **1 er svært uenig** og **5 er svært enig:**	Svært uenig 1	2	3	4	Svært enig 5
Jeg ser på meg selv som en erfaren mobilbruker	○	○	○	○	○
Jeg ser på meg selv som en erfaren bruker av SMS	○	○	○	○	○
Jeg ser på meg selv som en erfaren bruker av MMS	○	○	○	○	○

Klikk på "Send" når skjemaet er utfylt og du er klar til å gå til side 3   [Send]   [Nullstill]

Sidene vedlikeholdes av per.pedersen@nhh.no

SNF

Side **3** av 4

Vi vil nå at du konsentrerer deg om **TV-programmet BigBrother.**

Svar på spørsmålene ut fra dine **erfaringer.** Hvis du ikke har erfaringer vil vi likevel at du svarer på spørsmålene ut fra det du **vet** eller **tror** om **TV-programmet BigBrother.**

Vennligst ta stilling til følgende utsagn på en **skala** fra 1 til 5 der **1 er svært uenig** og **5 er svært enig:**	Svært uenig 1	2	3	4	Svært enig 5
BigBrother har en profil det er lett å kjenne igjen	○	○	○	○	○
BigBrother skiller seg klart ut fra andre underholdningsprogrammer	○	○	○	○	○
Jeg trenger ikke se etter kanal-logoen på skjermen for se at det er BigBrother jeg ser på	○	○	○	○	○
Når noen spør meg hva som er på TV i kveld husker jeg BigBrother først	○	○	○	○	○
	Svært uenig 1	2	3	4	Svært enig 5
Jeg er svært tilfreds med BigBrother	○	○	○	○	○
BigBrother tilfredsstiller mine forventninger	○	○	○	○	○
Jeg er veldig fornøyd med BigBrother	○	○	○	○	○
Jeg har tilgang til andre underholdningsprogrammer som er like bra som BigBrother	○	○	○	○	○
Det beste underholdningsprogrammet er mye bedre enn BigBrother	○	○	○	○	○

Angi på en skala fra 1 til 5 hvordan du, sett under ett, vurderer **TV-programmet BigBrother**

Dårlig	○ 1	○ 2	○ 3	○ 4	○ 5	Bra
Forferdelig	○ 1	○ 2	○ 3	○ 4	○ 5	Utmerket
Negativt	○ 1	○ 2	○ 3	○ 4	○ 5	Positivt

Vennligst ta stilling til følgende utsagn på en **skala** fra 1 til 5 der **1 er svært uenig** og **5 er svært enig:**	Svært uenig 1	2	3	4	Svært enig 5
Jeg har brukt mye tid sammen med BigBrother	○	○	○	○	○
Rent følelsesmessig har jeg et godt forhold til BigBrother	○	○	○	○	○
BigBrother er en viktig del av min hverdag	○	○	○	○	○
BigBrother hjelper meg å vise hvem jeg ønsker å være	○	○	○	○	○
BigBrother viser hvilke verdier jeg står for	○	○	○	○	○
Jeg tror at andre forbinder BigBrother med meg	○	○	○	○	○
	Svært uenig 1	2	3	4	Svært enig 5
Jeg opplever meg selv som lojal til BigBrother	○	○	○	○	○
Jeg føler meg knyttet til BigBrother	○	○	○	○	○
Jeg er villig til å gjøre små offer for å kunne fortsette å se BigBrother	○	○	○	○	○
Jeg ønsker å holde meg til BigBrother i fremtiden	○	○	○	○	○
Jeg anbefaler gjerne BigBrother til mine venner	○	○	○	○	○

Klikk på "Send" når skjemaet er utfylt og du er klar til å gå til side 4   [Send] [Nullstill]

Sidene vedlikeholdes av per.pedersen@nhh.no

SNF

Side **4** av 4

Fortsett å konsentrere deg om **TV-programmet BigBrother**.

Vennligst ta stilling til følgende utsagn på en **skala** fra 1 til 5 der **1 er svært uenig** og **5 er svært enig**	Svært uenig 1	2	3	4	Svært enig 5
Jeg ser mye på BigBrother	○	○	○	○	○
Jeg ser på meg selv som en som ser mye på BigBrother	○	○	○	○	○
Jeg har tenkt å se mye på BigBrother hvis det starter opp igjen på nytt	○	○	○	○	○
Hvis kvaliteten på BigBrother blir lavere enn den er nå vil jeg heller primært følge med på et annet TV-program	○	○	○	○	○
Dersom BigBrother skuffer meg vil jeg heller primært følge med på andre TV-program	○	○	○	○	○

Angi på en skala fra 1 til 5, der 1 er svært lite eller ikke i det hele tatt og 5 er svært mye i hvilken grad du ser på følgende **sendinger fra BigBrother**.	Svært lite 1	2	3	4	Svært mye 5
Daglige sendingene med oppsummeringer (ma-fre + lø-sø, 20:30-21:30)	○	○	○	○	○
BigBrother direkte med Trygve Rønningen (to, 21:00-22:00)	○	○	○	○	○
BigBrother Online med chat (ma-fre, 19:00-19:30)	○	○	○	○	○
BigBrother uten filter (to 22:45-23:20)	○	○	○	○	○
BigBrother streaming på web	○	○	○	○	○
BigBrother 24 på Canal Digital	○	○	○	○	○

Angi på en skala fra 1 til 5, der 1 er svært lite eller ikke i det hele tatt og 5 er svært mye i hvilken grad du ser/har sett på følgende **TV-programmer**:	Svært lite 1	2	3	4	Svært mye 5
Camp Molloy (TV3)	○	○	○	○	○
Idol (TV2)	○	○	○	○	○
Robinson (TV3)	○	○	○	○	○
71 Grader Nord (TVN)	○	○	○	○	○

Vennligst **besvar følgende spørsmål**:

Hvor mye så du på BigBrother i går	○ Under 0.5 time	○ 0.5 - 1 time	○ 1-1.5 time
	○ 1.5-2 timer	○ 2-2.5 timer	○ Mer enn 2.5 timer
Hvor mye ser du vanligvis på BigBrother i løpet av en dag?	○ Under 0.5 time	○ 0.5 - 1 time	○ 1-1.5 time
	○ 1.5-2 timer	○ 2-2.5 timer	○ Mer enn 2.5 timer
Er du kvinne eller mann?	○ Kvinne ○ Mann		
Hva er din alder?	○ 0-19 ○ 20-29 ○ 30-39 ○ 40-49 ○ 50-59 ○ 60 og over		
Hva er din sivilstand?	○ Gift/samboer ○ Enslig/separert/skilt ○ Annen		
Hva er din høyeste utdanning?	○ Grunnskole ○ Videregående skole		
	○ Universitet/høyskole 1-3 år ○ Universitet/høyskole 4 år eller mer		
Omtrent hva er din personlige bruttoinntekt (kroner)?	○ Under 200 000 ○ 200 000 - 399 000		
	○ 400 000 - 600 000 ○ Over 600 000		
Hvor har du ditt primære mobilabonnement?	○ Telenor ○ Netcom ○ Sense ○ Tele2 ○ Annen operatør		

Klikk på "Send" når skjemaet er utfylt   [Send] [Nullstill]

Sidene vedlikeholdes av per.pedersen@nhh.no

PUBLIKASJONER INNEN TELEØKONOMI 1998 –

Herbjørn Nysveen Per E. Pedersen Helge Thorbjørnsen	*Using mobile services to strengthen brand relationships:* *The effects of SMS and MMS channel additions on brand* *knowledge, satisfaction, loyalty and main channel use.* SNF-Report No. 22/2003, Bergen
Stemsrudhagen, Jan Ivar	*The balanced scorecard and leadership:* *The system's (ir)relevance in an uncertain world.* SNF-Working paper No. 23/2003, Bergen
Spiller, Pablo T. Ulset, Svein	*Why Local Loop Unbundling Fails?* SNF-Working paper No. 87/2002, Bergen
Ulset, Svein	*The Rise and Fall of Global Network Alliances.* *Success or Failure?* SNF-Working paper No. 86/2002, Bergen
Ulset, Svein	*The Disintegration of Network Externalities Industries. The* *Computer and the Telecommunications Equipement Industries.* SNF-Working paper No. 85/2002, Bergen
Ulset, Svein	*Restructuring Diversified Telecom Operators.* SNF-Report No. 57/2002, Bergen
Ulset, Svein	*Corporate versus Contractual Knowledge Transfer to Foreign* *Operations. The Case of Mobile Network Operators.* SNF-Report No. 56/2002, Bergen
Andersson, Kjetil Fjell, Kenneth Foros, Øystein	*Are TV-viewers and surfers different breeds?* *Broadband demand and asymmetric cross-price effects.* SNF-Working paper No. 14/2003, Bergen
Stemsrudhagen, Jan Ivar	*The causality of strategic control:* *three-level construction of causality.* SNF-Working paper No. 77/2002, Bergen
Barros, Pedro Kind, Hans Jarle Nilssen, Tore Sørgard, Lars	*Media competition when the audience dislikes advertising:* *A theory of vertical alliance on the Internet.* SNF-Working paper No. 79/2002, Bergen.
Pedersen, Per E. Nysveen, Herbjørn	*The adoption of a mobile parking service: Instrumentality and* *expressiveness.* SNF-Working paper No. 76/2002, Bergen.
Foros, Øystein Kind, Hans Jarle	*Økonomiske aspekter ved Internetts markedsstruktur.* SNF-arbeidsnotat nr. 74/2002, Bergen.

Nysveen, Herbjørn
Pedersen, Per E.

Individual and cross media communication in converging media environments: A review of research on the antecedents and effects of communication using various media in marketing contexts.
SNF-Working paper No. 65/2002, Bergen

Pedersen, Per E.
Nysveen, Herbjørn
Thorbjørnsen, Helge

The adoption of mobile services: A cross service study.
SNF-Report No. 31/2002, Bergen

Jensen, Sissel
Sannarnes, Jan Gaute

Prisregulering av et telenettverk: Prinsipiell analyse med særlig fokus på avkastnings- og pristaksregulering.
SNF-Report No. 37/2002, Bergen

Stemsrudhagen, Jan Ivar

Creative SMC in a Norwegian ICT company: managerial interaction with sources of realised strategies.
SNF-Report No. 26/2002, Bergen

Stemsrudhagen, Jan Ivar

Strategic control systems in action: managers' use of information devices in creational and institutionalising work.
SNF-Working paper No. 38/2002, Bergen

Pedersen, Per E.

The adoption of text messaging services among Norwegian teens: development and test of an extended adoption model.
SNF-Report No. 23/2002, Bergen.

Foros, Øystein
Kind, Hans Jarle
Sand, Jan Yngve

Do Incumbents Have Incentives to Degrade Interconnection Quality in the Internet?
SNF-Working paper No. 22/2002, Bergen.

Fjell, Kenneth

Elasticity based pricing rules in telecommunications – a cautionary note
SNF-Working paper No. 19/2002, Bergen.

Kristoffersen, Siri Hege

Prising og uforstand – ein analyse av prissetjing med ufullstendig informerte konsumentar i den norske marknaden for mobiltelefoni
SNF-rapport nr. 54/2001, Bergen.

Pedersen, Per E.

Adoption of mobile commerce: An exploratory analysis
SNF-Report No. 51/2001, Bergen.

Gabrielsen, Tommy Stahl
Vagstad, Steinar

On how size and composition of customer bases affect equilibrium in a duopoly with switching cost
SNF-Working paper No. 26/2001, Bergen.

Berge, Laila Kristin

Prisdiskriminering i oligopol
-en teoretisk gjennomgang og eksempler fra telemarkedet
SNF-rapport nr. 13/2001, Bergen.

Bjørndal, Mette Jørnsten, Kurt	*An Analysis of a Combinatorial Auction.* SNF-Working paper No. 19/2001, Bergen.
Vagstad, Steinar	*Price discrimination with uncertain consumers.* SNF-Working Paper No. 12/2001, Bergen.
Gooderham, Paul N. Ulset, Svein	*Knowledge transfer between parent and developing country subsidiaries. A Conceptual Framework.* SNF-Working Paper No. 08/2001, Bergen.
Staahl Gabrielsen, Tommy Vagstad, Steinar	*Second-period pricing in a duopoly with switching costs: the effect of size and composition of customer bases.* SNF-Working Paper No. 09/2001, Bergen.
Pedersen, Per E.	*Adopsjon av mobil handel (m-handel) -en forstudie* SNF-rapport nr. 07/2001, Bergen.
Hundsnes, Tore	*The Management of Complexity* SNF-Report No. 58/2000, Bergen.
Knivsflå, Kjell Henry Rud, Linda Sættem, Frode	*Kapitalnettverk for små og mellomstore bedrifter* SNF-rapport nr. 72/2000, Bergen.
Foros, Øystein	*Strategic Investments with Spillovers, Vertical Integration and Foreclosure in the Broadband Access Market* SNF-Working Paper No 75/2000, Bergen
Lommerud, Kjell Erik Sørgard, Lars	*Entry in Telecommunication: Customer Loyalty, Price Sensitivity and Access Prices.* SNF-Working Paper No. 62/2000, Bergen.
Munkeby, Trygve Osvoll	*Konkurransen mellom norske internetleverandørar.* SNF-rapport nr. 48/2000, Bergen.
Pedersen, Per E. Methlie, Leif B.	*Tjenesteintegrering i elektronisk handel.* SNF-rapport nr. 21/2000, Bergen.
Methlie, Leif B. Pedersen, Per E.	*MAP-IT: A Model of intermediary Integration Strategies in online Markets.* SNF-Working Paper No. 26/2000, Bergen.
Gabrielsen, Tommy Staahl Vagstad, Steinar	*Consumer heterogeneity and pricing in a duopoly with switching costs.* SNF-Working Paper No. 25/2000, Bergen.

Ulset, Svein Gooderham, Paul	*Internasjonalisering av telesektoren. Generelle lærdommer og spesielle utfordringer for Telenor.* SNF-arbeidsnotat nr. 16/2000, Bergen.
Ulset, Svein	*Virtual Network Operation. Strategy, Structure and Profitability.* SNF-Working Paper No. 15/2000, Bergen.
Foros, Øystein Kind, Hans Jarle Sørgard, Lars	*Access Pricing, Quality Degradation and Foreclosure in the Internet.* SNF arbeidsnotat nr. 12/2000, Bergen.
Foros, Øystein Sand, Jan Yngve	*Asymmetrisk regulering innen telekommunikasjon.* SNF særtrykk nr. 03/2000, Bergen.
Ulset, Svein	*Ekspansive teleselskap. Finansiering, organisering og styring.* SNF-rapport nr. 64/1999, Bergen.
Sannarnes, Jan Gaute	*Ulike reguleringsregimer i telesektoren sett ut fra et dynamisk perspektiv.* SNF-rapport nr. 58/1999, Bergen.
Seime, Gunn Randi	*Konkurransen i det norske mobiltelefonimarkedet.* SNF-rapport nr. 49/1999, Bergen.
Methlie, Leif B. Pedersen, Per E.	*Multimedia Banking* *Bankenes strategiske situasjon. Ny teknologi – ny konkurransearena – ny struktur.* SNF-rapport nr. 41/1999, Bergen.
Pedersen, Per E.	*Multimedia Banking* *Programvareagenter i elektronisk handel. En kartlegging med vekt på agentbaserte tjenester og finanstjenestesektoren.* SNF-rapport nr. 40/1999, Bergen.
Pedersen, Per E.	*Multimedia Banking* *En agentbasert tjeneste for produkt- og leverandør-sammenlikning av finanstjenester.* SNF-rapport nr. 39/1999, Bergen.
Pedersen, Per E. Nysveen, Herbjørn Jensen, Leif Magnus	*Multimedia Banking* *En eksperimentell studie av atferdskonsekvenser ved bruken av agentbaserte tjenester i finanssektoren.* SNF-rapport nr. 38/1999, Bergen.

Fjell, Kenneth   *Problemstillinger for videre forskning på prising av tele-*
Foros, Øystein   *tjenester.*
Gabrielsen, Tommy S.   SNF-rapport nr. 27/1999, Bergen.
Hagen, Kåre P.
Sørgard, Lars
Vagstad, Steinar

Fjell, Kenneth   *Oversikt over forskningsprogrammet i teleøkonomi ved SNF:*
Hagen, Kåre P.   *1996-1998.*
                        SNF-rapport nr. 26/1999, Bergen.

Fjell, Kenneth   *Telenor – bare lave priser ?*
Foros, Øystein   *Drøfting av Telenors rabattstruktur utfra et bedriftsøkonomisk*
Hagen, Kåre P.   *og samfunnsøkonomisk perspektiv.*
Sørgard, Lars   SNF-rapport nr. 23/1999, Bergen.

Staahl Gabrielsen, Tommy   *Konkurranseform i telesektoren: Hvordan rasjonalisere*
Vagstad, Steinar   *observert atferd?*
                            SNF-rapport nr. 65/1998, Bergen.

Altenborg, Ellen   *Koordinering og insentiver i samarbeid om produktutvikling*
                        mellom forretningsområder i Telenor.
                        SNF-rapport nr. 39/98, Bergen

Methlie, Leif   *Multimedia Banking*
                        Strukturendring i bank. Distribusjon – grovanalyse.
                        SNF-arbeidsnotat nr. 31/1998, Bergen.

Methlie, Leif   *Multimedia Banking*
                        Strukturendring i bank. Strategisk posisjonering –
                        grovanalyse.
                        SNF-arbeidsnotat nr. 30/1998, Bergen.

Foros, Øystein   *Naturlige grenser for teleselskapene.*
Ulset, Svein   SNF populærvitenskapelig særtrykk nr. 10/1998, Bergen.

Ulset, Svein   *Organizing Global Seamless Networks: Contracts, Alliances*
Spiller, Pablo   *and Hierarchies.*
                        SNF Reprint No. 26/1998, Bergen.

Ulset, Svein   *Infrastruktur og konkurranse i telesektoren.*
                        SNF særtrykk nr. 27/1998, Bergen.

Ulset, Svein   *Value-Creating Interconnect*
                        International Competition in Global Network Services.
                        Technology, Organization and Performances.
                        SNF-report No. 28/1998, Bergen.

Ulset, Svein	*Value-Creating Interconnect* *Optimal Organization of the Converging Information and* *Communication Technology (ICT) Industries.* *Theoretical analysis and some illustrative data from the* *Norwegian market.* SNF-report No. 27/1998, Bergen.
Methlie, Leif B. Nysveen, Herbjørn	*Multimedia Banking* *Kundeatferd ved bruk av Internett og andre kanaler.* SNF-rapport nr. 29/1998, Bergen.
Ulset, Svein	*Verdiskapende samtrafikkavtaler.* *Hvordan kan organisering av infrastruktur bidra til utvikling* *av bedre og billigere teletjenester. En analyse av betingelsene* *for konkurranse og samarbeid i telesektoren.* SNF-rapport nr. 25/1998, Bergen.
Spiller, Pablo T.	*Value-Creating Interconnect.* *Unbundling and the Promotion of Local Telephone* *Competition: Is Unbundling Necessary in Norway?* SNF-Report No. 03/1998, Bergen.
Bjørnenak, Trond Gabrielsen, Tommy Staahl Vagstad, Steinar	*Verdiskapende samtrafikkavtaler.* *Prising av samtrafikk.* SNF- rapport nr. 02/1998, Bergen.
Andersen, Christian Sannarnes, Jan Gaute	*Analyse af tilgangsafgifter ved irreversible investeringer under* *usikkerhed.* SNF-rapport nr. 07/1998, Bergen.

Oversikt over publikasjoner innen teleøkonomi i perioden 1992-1997 fås ved henvendelse til
tonje.skaar@snf.no, telefon 55 95 95 00.