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## Mobile ad intrusiveness – The effects of message type and situation

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### **Abstract**

*This study addresses the effects of message type and situation on the perceived intrusiveness of mobile advertisements. Ad intrusiveness, as conceptualized by Li et al., is introduced to the field of mobile advertising and used as dependent variable in a 2x2 within-subjects factorial study design. Two message types (informative vs. entertaining) are combined with two different situations (low vs. high level of activity). Attitude towards advertising in general and ad relevance (here: product class involvement) are further variables assessed in order to test for a hypothesized impact on mobile ad intrusiveness. A survey approach was used for data collection (n=325). Main effects were analyzed with analysis of variance. Analysis of covariance and regression analysis were applied subsequently for analyzing further effects. While message type was not found to contribute significantly to the explanation of mobile ad intrusiveness, the situation type showed a highly significant effect. Three of the four assumed relationships were found in the data. The study contributes to the body of knowledge on mobile advertising effectiveness. Empirical evidence for the effects of the situational context on mobile advertising effectiveness has been found and discussed with possible implications for marketing practice.*

**Keywords:** mobile advertising, intrusiveness, message type, situation

## **1 Introduction**

Mobile advertising has developed into a heavily discussed topic in academia and practice. The characteristics of the mobile channel make marketing communications via mobile devices attractive option for marketers, since consumers are more and more confronted with information overload and multichannel advertising clutter (Nan & Faber 2004). Ubiquity, user specificity, interactivity, and context sensitivity are just a few buzzwords that drive direct

marketers' expectations towards the mobile channel. The fact that consumers can be reached at any time and any place has the potential to lift direct marketing up to a new level. Higher response rates and multiplying viral effects are envisioned (Barnes & Scornavacca 2004; Carroll et al. 2007).

The large attention paid to mobile advertising leads to an increasing number of studies and essays that address possible success factors and/or barriers of mobile advertising effectiveness. A literature analysis reveals that conceptual works and first empirical studies dominate the research activities (Leppäniemi & Karjaluoto 2005; Scharl, Dickinger & Murphy 2005; Drossos & Giaglis 2005; Scornavacca, Barnes & Huff 2006). Pilot mobile advertising campaigns have been launched and consumers' and marketers' reactions have been assessed (Viehland & Brink 2006; Komulainen, Ristola & Still 2006). However, there is still a significant need for studies which address the specificities of the 'mobile' in mobile advertising. The assessment of mobile advertising effectiveness and especially the identification of factors contributing or hindering it remain challenging (Drossos & Giaglis 2005). Research on mobile advertising is additionally hampered by the fact that it has not really developed into a widely spread marketing measure, yet. Only a fraction of consumers already has experiences with receiving mobile advertising messages. When assessing the potentials of mobile advertising, many authors revert to attitudes towards mobile advertising or related constructs which are hypothesized to indicate acceptance and effectiveness of mobile advertising in the long run (Scharl et al. 2005; Leppäniemi & Karjaluoto 2005; Haghirian & Madlberger 2005). This paper chooses a different approach for gaining a deeper understanding of mobile advertising by focusing on consumers' possible negative perceptions of mobile advertising.

Marketers show significant concerns regarding the use of the mobile channel for marketing communications (Komulainen et al. 2006). It is feared that recipients of mobile advertising messages experience them as extremely intrusive (Giaglis, Kourouthanassis & Tsamakos 2003; Haghirian & Madlberger 2005). This paper introduces the concept of ad intrusiveness to mobile advertising research (section 2) and assesses possible factors which contribute to consumers' perceptions of intrusiveness when receiving advertising messages on their mobile devices (section 3). A survey with an experimental set up has been conducted (n=325) and will be reported on in section 4. ANOVA and regression analysis are used for hypothesis testing (section 5). The results are discussed (section 6), followed by an elaboration on limitations (section 7) and a conclusion (section 8).

## **2 Ad intrusiveness in the mobile channel**

### **2.1 Mobile advertising**

Mobile advertising is a type of mobile marketing communications. The medium of message delivery influences to a large extent, the possible characteristics and instances of mobile advertising (Jelassi & Enders 2004). Mobile advertising is subject to a growing body of scholarly work (Carroll et al. 2007). Pousttchi and Wiedemann (2006) developed a morphological box of mobile marketing (advertising) characteristics, of which parts are shown in Table 1.

**Table 1: Morphological box of mobile marketing communication characteristics (adapted from Pousttchi & Wiedemann 2006)**

characteristics	instances			
<i>initiation</i>	push		pull	
<i>added value</i>	information	entertainment	raffle	monetary incentive
<i>opt-in</i>	conventional	electronic	mobile	none
<i>degree of interactivity</i>	dialogue		reaction	none
<i>enabling technology</i>	high-level language	WAP	MMS	SMS
<i>positioning</i>	mobile network dependent tech.	specialized positioning system	manual	none

Mobile advertising usually requires prior permission by the recipient (Kavassalis et al. 2003). Depending on how comprehensive such a permission is, several mobile advertising campaign designs are imaginable. An analysis of mobile ad intrusiveness mainly applies to push campaigns because a perception of intrusiveness is most likely to form in cases where ad reception is surprising or unexpected. Permission for mobile push advertising is oftentimes required by law and is considered to be a ‘hygiene factor’ on mobile marketing (Barnes & Scornavacca 2004). However, although a prior opt-in has been performed, the exact ad message content, delivery time, and place is likely to be not in total control of the recipient. Thus, this brief excursus on the basic characteristics of mobile advertising shows the relevance of ad intrusiveness perceptions even in cases where permission has been given before.

## 2.2 Ad intrusiveness

Intrusiveness of advertising has been conceptualized and applied to classical and online advertising (Li, Edwards & Lee 2002; Ha 1996). It is believed to be a cause for ad avoidance (Speck & Elliott 1997) and irritation (Aaker & Bruzzone 1985) which are both negative outcomes of exposure to advertising. Irritation refers to a state of mind after the mainly affective processing of the advertising message and can be caused by ad content, execution, and placement (Li et al. 2002). Avoidance is a more cognitive and behavioural outcome of advertising exposure. It directly juxtaposes the advertisers’ persuading efforts because people withdraw their attention deliberately or mechanically (Speck & Elliott 1997).

Edwards et al. (2002) claim that intrusiveness is a “psychological reaction to ads that interfere with a consumer’s ongoing cognitive processes”. This shows a strong link between ad intrusiveness and the context (environment, task,...) in which ad reception takes place. The context, however, can be much more diverse in a mobile setting than in a traditional advertising setting. This is one reason why mobile marketers still show some reluctance towards the exploitation of mobile advertising potentials.

Intrusiveness is an individual perception, not a characteristic of the advertising message. Several authors state that the more recipients recognize advertisements as disturbing and intrusive, negative outcomes like irritation and avoidance may result (Edwards et al. 2002). The perceived intrusiveness is conceptually distinct from emotional (irritation) and behavioural (avoidance) outcomes which may result (Edwards et al. 2002).

The concept of perceived ad intrusiveness fits to the discussion on mobile advertising acceptance and effectiveness. It is one latent variable of concern when authors and practitioners highlight the personal nature of mobile devices in the context of mobile marketing (Jarvenpaa & Lang 2005; Bauer et al. 2005). Such a personal nature of mobile devices is one reason why mobile advertising is assumed to be potentially more intrusive than advertising via other channels and media (Haghirian & Madlberger 2005; Jelassi & Enders 2004). After the literature analysis, ad intrusiveness was found to show promise for an application to mobile advertising.

### **3 Development of hypotheses**

Ad intrusiveness has been described above as an evaluation of the degree of interference of cognitive processes one experiences when receiving or being exposed to an ad (Edwards et al. 2002). Ha (1996) described intrusiveness in traditional advertising media as the degree of interruption of an editorial unit. Edwards et al. (2002) extend this notion into the realm of online advertising, in which ad reception may take place in non-editorial content, such as e-mail or chat rooms: “Exposure to ads is becoming more prevalent, and technology now allows for ads to be forced on viewers at unexpected intervals or in non-traditional settings” (Edwards et al. 2002, p. 39). This statement is even more true and relevant on the move – in a mobile setting. Advertising can be pushed to the recipients at any time that appears reasonable for marketers. A classical example might be a SMS campaign by a beer brewery which is launched on a Friday evening when the targeted segment is expected to hit the pubs. However, such an ad might reach the recipient in a totally different situation than expected by the marketer. He/she might be involved in a romantic first-date candlelight dinner where a SMS ad is more likely to be perceived as an intrusive atmosphere-killer. In such a case, negative effects might be the consequence.

Edwards et al. (2002) found ad intrusiveness to be a good predictor of ad irritation (Aaker & Bruzzone 1985) and ad avoidance (Speck & Elliott 1997) which can both significantly hamper the effectiveness of an ad. Especially ad avoidance clearly juxtaposes marketers’ goals because the recipients consciously withdraw themselves from advertising exposure e.g. by zapping, closing, turning off, etc. Mobile ads in the forms of SMS or MMS could be not opened, instantly deleted or the like. If mobile advertising increases significantly, it is furthermore likely that mobile spam filtering will be in use (HP 2004). Ad avoidance could then be prolonged by putting the sender of an intrusive and/or irritating mobile ad on a mobile spam list so that future ads will be blocked or instantly deleted.

Li et al. (2002) developed a 7-item scale for measuring the intrusiveness of advertisements which shows good psychometric properties. It has been successfully applied by Edwards et al. (2002) to the case of online pop-up ads. The items of the scale are generic and can be used for the measurement of ad intrusiveness perceptions in any advertising medium. Ad intrusiveness was used as dependent variable in this study. Consequences of intrusiveness were not included since their relation has been previously validated. Following previous research, we assume mobile ad intrusiveness to be related to other constructs that negatively influence mobile ad effectiveness.

### *Message characteristics*

Message characteristics are closely related to ad effectiveness and consumer behaviour. They are the sum of relevant factors that can be directly influenced by marketers and are in the focus of numerous studies on how advertising works (Vakratsas & Ambler 1999). Message characteristics in a narrow sense are the contents of an advertisement. For the case of SMS ads, wording and content of the ad is crucial (Scharl et al. 2005). Advertising research suggests that an advertisement should deliver value to the recipient for being effective (Ducoffe 1996). Two types of content for value creation have especially been considered in studies on consumers' attitudes towards (mobile) advertising: informativeness and entertainment (Okazaki 2004; Leung & Cheung 2004; Eighmey 1997). Authors propose both, entertainment and informativeness, to positively influence attitudes towards mobile advertising (Tsang, Ho & Liang 2004; Haghirian & Madlberger 2005; Haghirian, Madlberger & Tanuskova 2005b). Feelings of enjoyment associated with advertisements dominantly influence peoples' overall attitudes to them (Shavitt, Lowrey & Haefner 1998; Haghirian & Madlberger 2005; Xu 2006). Correspondingly, Edwards et al. (2002) show that online ads which are more entertaining or informative are perceived as less intrusive. Informativeness showed a slightly stronger effect on intrusiveness perceptions. Thus, it is expected that

H1a: The informativeness and/or the entertainment of mobile ads affect perceptions of ad intrusiveness

H1b: Informative mobile ads lead to perceptions of lower ad intrusiveness than entertaining ads.

### *Situation*

The situational context (especially time and location) in which a mobile ad is received by a consumer is of crucial importance to how a he/she reacts to it (Barnes & Scornavacca 2004). Location independence and ubiquity are among the key arguments for mobile advertising. However, they also impose new challenges for targeting and personalization of marketing campaigns. Push-ads need to be thoroughly targeted to very distinct segments in order to develop the desired impact (Scharl et al. 2005). In any case, the situation one is involved in influences whether one perceives an ad as distracting and intrusive or as an appreciated incident of information or entertainment (Drossos & Giaglis 2004). Li et al. (2002) state that the intensity of tasks in which one is involved when receiving an ad will affect the degree of perceived intrusiveness. This corresponds with the definition of intrusiveness given above. Thus, it is assumed that

H2: In situations with higher levels of activity, mobile ads are perceived more intrusive than in situations with lower levels of activity.

### *Attitude towards advertising*

Consumers show different interest in advertising in general. Differences exist also between advertising media (Elliott & Speck 1998). The general attitude consumers' hold towards advertising is likely to influence their reactions to a specific advertisement (MacKenzie & Lutz 1989). Attitude towards the ad is a construct that has often been applied for assessing the effects of advertisements

and for identifying further factors which influence advertising effectiveness (Brown & Stayman 1992; MacKenzie & Lutz 1989).

Like attitude towards the ad, ad intrusiveness pertains to a particular exposure to a particular ad (Lutz, MacKenzie & Belch 1983). In contrast to that, attitude towards advertising is defined as a learned predisposition to respond in a consistently favourable or unfavourable manner towards advertising in general (MacKenzie & Lutz 1989).

It is expected that mobile advertising does not stand out from other advertising media regarding one's attitude towards advertising in general. Consumers, who show reluctance and a less favourable attitude towards advertising in traditional media like TV and magazines, are likely to have a less favourable attitude towards mobile advertising as well. Thus, it is expected that consumers with a low attitude towards advertising in general will show higher perceptions of ad intrusiveness. This follows the argumentation of MacKenzie & Lutz who stated that attitude towards advertising is likely to influence attitude towards the ad. Direct or mediated effects were hypothesized (MacKenzie & Lutz 1989).

Therefore it is assumed that

- H3: More favourable attitudes towards advertising in general will lead to lower degrees of perceived mobile advertising intrusiveness.

By including attitude towards advertising, it is intended to filter out the share of variance in perceptions of ad intrusiveness that is due to this 'predisposition'.

#### *Ad relevance*

Consumers expect the content of mobile services to be personalized according to their own interests (Robins 2003; Wehmeyer & Müller-Lankenau 2005). Personalization of mobile advertising is considered to be one important success factor for advertising effectiveness (Scharl et al. 2005; Haghirian, Madlberger & Tanuskova 2005a; Xu 2006). The relevance of an ad's content to the recipient is a major factor influencing consumers' reactions and, ultimately, advertising effectiveness (Drossos & Giaglis 2004). Xu (2006) believes that the personalization of content is the most effective way to prevent mobile advertising from being perceived as intrusive. Ad relevance can be seen as the result of successful targeting and/or personalization.

Thus, similar to the case of attitude towards advertising, ad relevance should be included in this study in order to identify how the perceived intrusiveness is increased or diminished if the advertisement promotes a product that is of interest to the subjects or not. Ad relevance is considered to be of such importance to ad effectiveness that not taking it into account could hinder the main effects' interpretation.

The construct of involvement is established in marketing for describing the relevance of product classes to the needs and values of a customer. In the advertising domain, involvement determines whether a recipient is personally affected by the ad and motivated to respond to it (Zaichkowsky 1985; Phelps & Thorson 1991). Product class involvement scales can be used to assess "a person's perceived relevance of an object (or class of objects) based on inherent needs, values, and interests" (Zaichkowsky 1985, p. 342). Mobile advertisements which promote products of interest to a particular consumer can be considered relevant and personalized if the consumer-product fit is the result of marketers' targeting efforts. The degree of a user's product class involvement is then a measure for ad

relevance if the advertised product is part of the assessed product class. Mobile ads which are relevant to the recipients are considered to be more effective and therefore tend to be perceived as less intrusive. Consequently, it is proposed that

- H4: Relevant mobile ads (as reflected by a higher product class involvement) are perceived less intrusive than irrelevant mobile ads.

The developed hypotheses lead to a conceptual model which is shown in Figure 1.

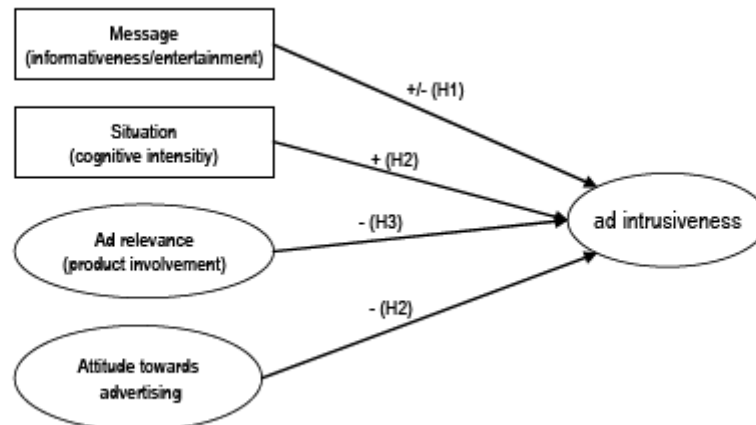


Figure 1: Conceptual model of hypothesized effects

The influences of different message types and situations on perceptions of ad intrusiveness are the main effects to be analysed which determine the experimental setup. Ad relevance and attitude towards advertising are included to gain further insight into possible variance of ad intrusiveness perceptions.

## 4 Method

Assessing the effectiveness of mobile advertising is rather challenging since experimental designs that would include crucial aspects like time and place are hard to set up and control. Conceptual studies dominated the research on mobile business in the past (Scornavacca et al. 2006). Few field studies on mobile advertising effectiveness have been conducted (Andersson & Nilsson 2000; Komulainen et al. 2006). In most of the cases, the support of a network operator, mobile marketing agency, or other company was required. Several survey approaches are also reported on in literature (Okazaki 2004; Tsang et al. 2004; Carroll et al. 2007; Scornavacca et al. 2006).

This study primarily aims at analysing the influence of ad message type and the recipients' situation on perceptions on mobile ad intrusiveness. A survey-based simulated experiment was conducted in order to test the formulated hypotheses. The experiment showed a 2 (message type) X 2 (situation) within-subjects factorial design. A web questionnaire was created which included situation and message descriptions as well as scales for the assessment of ad intrusiveness, ad relevance (product class involvement), and attitude towards advertising. The experimental design was simulated in the questionnaire as follows.

Subjects were first asked to respond to items assessing their individual product class involvement for two classes (cars and fashion). After that, subjects' attitude towards advertising in general was queried. Subsequently, subjects were asked to imagine a situation that is verbally described in the online questionnaire. Two



situations were designed for reflecting extremes in levels of activity and cognitive intensity. They are situations from every day life that can easily be imagined by every subject. Situation 1 represents a low level of activity and cognitive intensity. It was formulated as follows:

*“On a sunny day you are sitting at the station and waiting for your train to arrive. It is scheduled to reach the station in about 10 minutes. You are relaxed and looking forward to a peaceful week-end. At this moment you receive a text message on your mobile.”*

Situation 2 depicts a high level of activity and cognitive intensity:

*“It is Sunday evening around 9.30. You are sitting in front of the TV and watching a movie you have been looking forward to all week. The story is reaching its peak. Suddenly, your mobile is beeping. You’ve got a message!”*

Further, in each situation the subjects were asked to imagine the reception of two different advertising messages. Message 1 was designed to primarily deliver information, message 2 is primarily entertaining. The messages promote different product classes. Message 1 informs about the new collection of a fashion retail chain, message 2 includes a short entertaining video clip sent by a car manufacturer. No brands were mentioned in order to avoid bias from existing attitudes towards specific brands. For each of the four cases, subjects have to respond to a short scale that measures the perceived ad intrusiveness.

The scales that are used were all taken from previous studies and only slightly modified to fit the present study. All items are provided with a 5-point likert-type scale where 1 = strongly disagree and 5 = strongly agree. Ad intrusiveness is assessed by a 7-item-scale taken from Li et al. (2002). Product class involvement items (8) were taken from Zaichkowsky (1985). Finally, attitude towards advertising was assessed with the help of items describing one’s attitude towards an ad. They have been slightly reformulated to fit attitude towards advertising in general. The 6 items were taken from two different studies (Chattopadhyay & Nedungadi 1992; Phelps & Thorson 1991).

The Web survey was announced among IS students and in student related newsgroups. People were asked to forward the request for participation to friends and colleagues leading to a partly respondent-driven snowball sampling approach (Salganik & Heckathorn 2004; Bryman & Bell 2007).

## **5 Data analysis and results**

A total of n=325 subjects participated in the Web survey. Respondents were between 14 and 64 years old (mean=25.36); 65% were male, 35% female. The main effects to be analysed were those of message type and situation on ad intrusiveness. Both variables were set in the experimental design as described above. Product class involvement (ad relevance) and attitude towards advertising in general were added as potentially influential variables regarding perceptions of mobile ad intrusiveness.

### *Scale reliability*

Cronbach’s  $\alpha$  was computed for product class involvement, attitude towards advertising, and ad intrusiveness. Due to the survey design, each respondent had to respond twice to the involvement items and four times to the intrusiveness

items. Just one set of items responses were used for reliability assessment. All scales showed a high internal consistency of above .90 (Table 2).

**Table 2: Internal consistency of the instruments**

Scale	# items	Cronbach's alpha
Involvement	8	.937
Attitude towards advertising	7	.905
Ad intrusiveness	7	.903

All three measures are reliable and well exceed the desired threshold of .70 (Lewis, Templeton & Byrd 2005). The high values are not surprising since all measures were taken from literature and have been validated before in several studies.

### *Descriptive Statistics*

The computation of means and standard deviations for each construct delivered the values shown in Table 3.

**Table 3: Variables' means and standard deviations**

Variable	Mean	SD
Involvement (cars)	3.140	.979
Involvement (fashion)	2.919	.955
Attitude towards advertising	2.668	.811
Ad intrusiveness (all permutations)	3.402	1.128

General means of the variables show values around the 'neutral value' of 3, since the leftmost option on the Likert-scales was coded with 1. A slightly lower (higher) mean was found for attitude towards advertising (ad intrusiveness) which might indicate some scepticism towards advertising in general in our sample. The means for ad intrusiveness as dependent variable of this study are displayed in Table 4.

**Table 4: Means for ad intrusiveness by experimental condition**

Situation	Message type		
	Information	Entertainment	
Low cognitive load (station)	2.891 (n=325)	3.053 (n=325)	2.972 (n=650)
High cognitive load (TV)	3.839 (n=325)	3.825 (n=325)	3.833 (n=650)
	3.364 (n=650)	3.440 (n=650)	3.402 (n=1300)

Each experimental condition is passed once by each subject (n=325). This leads to a total of n=1300 cases to be analyzed. The mean value in the lower right corner of Table 4 equals the overall mean for ad intrusiveness in Table 3. The means in Table 4 show differences according to experimental conditions. There appears to be a clear difference in perceived mobile ad intrusiveness between the two situations that were created for the experiment. In the TV-situation (high cognitive load) the mean perceived mobile ad intrusiveness is higher (3.883) than in the

other (2.972). Concerning message type, such a difference does not seem to exist. In fact, the mainly entertaining mobile ad is perceived slightly more intrusive than the informative one in the first situation ( $3.053 > 2.891$ ), but less intrusive in the second situation ( $3.825 < 3.839$ ). Furthermore, these differences are not very high.

*Multivariate analyses*

In order to test for the significance of the differences in means, an ANOVA was conducted which included message type and situation as fixed variables and ad intrusiveness as the dependent variable (Table 5).

**Table 5: ANOVA results for main effects and interaction**

	<i>F</i>	<i>p (.01 level)</i>	<i>Percent of variance explained</i>
Message type	1.669	.197	.00
Situation	221.463	.000	14.60
Message type X Situation	2.311	.129	.00

The ANOVA confirmed the picture drawn by the simple comparison of means. Only the situation's variation contributes significantly to the explanation of variance found in the dependent variable values. Squared partial etas revealed that about 14.6 % of the variance in ad intrusiveness scores can be explained with the situation. Message type and the interaction effect are both not significant. No variance is explained by them according to the ANOVA results. The results at this stage of analysis would lead to a support of H2 and a rejection of H1.

The relatively low percentage of variance explained by the main effects requires further analyses involving attitude towards advertising and ad relevance.

However, the analysis has to be conducted stepwise since the two involvement scores of each subject only relate to half of the  $n=1300$  cases that result from the 2x2 experimental design. In contrast, attitude towards advertising in general was only surveyed once per subject. It can be included as a covariate in an analysis of covariance (Table 6).

**Table 6: Effect of attitude towards advertising as covariate**

	<i>F</i>	<i>p (.01 level)</i>	<i>Percent of variance explained</i>
Attitude towards advertising	32.999	.000	2.50

The analysis of covariance delivered a significant effect of attitude towards advertising. Main effects and the interaction effect remain unchanged compared to the ANOVA results. However, the explanatory power appears to be low according to the squared partial eta of .025. Covariance effects of product class involvement require a split of the data. The results of the analyses are displayed in the following tables.

**Table 7: Analysis of covariance for message type 1 cases (informative, fashion)**

MESSAGE 1	F	p (.01 level)	Percent of variance explained
Situation	145.340	.000	18.40
Involvement (cars)	.258	.611	.00
Involvement (fashion)	24.889	.000	3.70
Attitude towards advertising	10.810	.001	1.60

**Table 8: Analysis of covariance for message type 2 (entertaining, cars)**

MESSAGE 2	F	p (.01 level)	Percent of variance explained
Situation	91.605	.000	12.40
Involvement (cars)	8.513	.004	1.30
Involvement (fashion)	3.876	.049	.60
Attitude towards advertising	6.833	.009	1.00

The results show that product class involvement has a significant effect on ad intrusiveness when the mobile ads promote the respective product. Although quite low, attitude towards advertising has a significant effect in both analyses. On the low levels that were found, fashion involvement showed a higher effect than involvement with cars. Also, in the cases with informative messages, the situation tends to have a stronger effect on ad intrusiveness than in the cases with entertaining mobile ads.

The above results do not lead to a rejection of H3 and H4. However, no information about the direction of effects can be drawn from ANOVA results. Thus, regression analyses have been conducted for the identification of loadings and their directions in order to better describe the effects of product class involvement and attitude towards advertising on perceived mobile ad intrusiveness. Since the squared partial etas were rather low before, it is expected that the R<sup>2</sup>-values of the regressions are likewise rather low. This is partly due to the fact that situation type and message type are not included in the regression models because of their level of measurement. Consequently, rather little of the variance in ad intrusiveness will be explained. However, regression results are expected to deliver the desired information on the direction of effects.

Similar to the analyses of covariance, regression analyses are conducted stepwise requiring a split of the data.

**Table 9: Results of regression of attitude towards advertising on ad intrusiveness**

Model	R <sup>2</sup>	Beta	T (p-value)	F (p-value)	H testing result
Intrusiveness = attitude towards advertising + error	.021	-.145	-5.298 (.000)	28.068 (.000)	H3 supported

Table 9 shows support for H3. The previously identified significant effect of attitude towards advertising in general on perceived mobile ad intrusiveness was found as a negative coefficient loading in the regression analysis. However, as expected, the R<sup>2</sup> is very low indicating a poor fit of this very simple model. Nevertheless, the results lead to an overall support of H3.

**Table 10: Results of regression analysis for message 1 cases (informative, fashion)**

Model (Message1)	R <sup>2</sup>	Beta	T (p-value)	F (p-value)	H testing result
Intrusiveness = attitude towards advertising + involvement (cars) + involvement (fashion) + error	.058			13.357 (.000)	
Attitude towards advertising		-.118	-2.972 (.003)		H3 supported
Involvement (cars)		-.018	-.460 (.646)		H4 indirectly supported
Involvement (fashion)		-.179	-4.510 (.000)		H4 supported

**Table 11: Results of regression analysis for message 2 cases (entertaining, cars)**

Model (Message2)	R <sup>2</sup>	Beta	T (p-value)	F (p-value)	H testing result
Intrusiveness = attitude towards advertising + involvement (cars) + involvement (fashion) + error	.034			7.552 (.000)	
Attitude towards advertising		-.135	-2.448 (.015)		H3 supported
Involvement (cars)		-.107	-2.732 (.006)		H4 supported
Involvement (fashion)		-.074	-1.844 (.066)		

The regression results in Tables 10 and 11 show support for H3 and H4. Again, the models' fit only shows low R<sup>2</sup>-values. However, attitude towards advertising significantly influences perceptions of mobile ad intrusiveness in both message scenarios. Involvement significantly influences intrusiveness in the respective scenarios. The directions were as hypothesized.

Further analyses have explored the effects of subjects' age by including it in the regression models. No significant influence could be found. R<sup>2</sup>-values did not rise notably.

## 6 Discussion

The results show support for three of the previously formulated hypotheses. The main effects in the experimental design were addressed in H1 and H2. H1 had to be rejected because ANOVA results did not reveal a significant effect of the message type (informative or entertaining) on the perceived intrusiveness of mobile advertising. Both parts of H1 were not supported. This becomes strikingly obvious in Table 4 where the means of ad intrusiveness by experimental condition are displayed. The main effect of message type might have been diluted by message content regarding the promoted products.

In contrast, the situation type was found to significantly influence perceptions of ad intrusiveness. H2 was supported and by that, dominant assumptions in literature on the relevance of time, location, and task involvement for (mobile) advertising effectiveness were supported (Barnes & Scornavacca 2004; Drossos & Giaglis 2004; Li et al. 2002). The study design used two extreme situations regarding to cognitive intensity or level of activity. The clear main effect of the situation type might be the result of this polarizing design. Message type differences might not have been so obvious to subjects because the messages included different content types (information/entertainment) and product types

(fashion/cars). The analyses of covariance (Tables 7 and 8) reveal that ad relevance represented by product class involvement has a significant effect on ad intrusiveness. Although the effect appears rather small, our data show that a mobile ad is perceived as less intrusive by our sample if it promotes products of their interest. In contrast to this, it was not important to subjects whether the ad was mainly informative or entertaining.

In sum, the main effects could be interpreted with a clear domination of the situations' effects over the message types' effects. Intrusiveness has been defined above as psychological reaction due to interference with consumers' cognitive processes. Thus, the perception of intrusion is most likely already formed in the moment of ad reception (beeping phone). At this time, the consumer has not even opened the message yet, but already feels disturbed. This implies that there is almost no chance for the advertiser to make up for this disturbance by delivering value (information, entertainment) with the message content. Intrusiveness is an immediate psychological reaction to the exposure or reception of an advertisement. In the case of mobile advertising by SMS or MMS, ad intrusiveness seems to result mainly from message reception and the disturbance (sound/vibration) caused thereof. In other media and types of advertising like TV or Internet pop-up ads, consumers are simultaneously exposed to the ads' content when 'receiving' the ad. Perceptions of intrusiveness and irritation are likely to mingle because the act of intrusion and the processing of the ad's content and sensual stimuli occur simultaneously. Thus, SMS-based advertising is highly prone to be perceived as intrusive because more than other types of advertising, it can attract attention to itself.

Furthermore, it is likely that consumers have not yet developed routines in mobile ad avoidance. Mobile telephony and especially SMS are very personal communication channels to many users (Kavassalis et al. 2003). Users are often emotionally attached to their mobile device and develop deep relationships to it (Wehmeyer 2007; Jarvenpaa & Lang 2005). In this sense, some authors report on almost compulsive user behaviour and that many users feel forced to read and answer messages shortly after receiving them (James & Drennan 2005; Wilska 2003). This behaviour pattern makes perceptions of mobile ad intrusiveness even more likely. While avoidance by zapping, flipping, or other behaviour works in other media, people are used to react instantly to being contacted via mobile communications. Thus, perceived intrusiveness could occur regardless of the sender, but if the sender turns out to have commercial interest and the content is irritating or annoying, consumers' negative reactions could be even stronger.

Such an interpretation of the study's results paint an even more challenging picture of mobile advertising. Advertisers have to put more effort into targeting of their mobile or cross-media campaigns in order to avoid negative reactions that might result from perceptions of mobile ad intrusiveness. The use of geographical data for targeting might cure some of the problems but simultaneously create new ones, like those related to privacy concerns (Barnes 2003). Sophisticated targeting would also cause additional costs for locating the users or buying the necessary data and requires considerable direct marketing expertise or the help of specialized advertising agencies.

The analysis of the remaining two variables' influence on mobile ad intrusiveness perceptions supported H3 and H4. The argument that ads should deliver value through relevance by fitting to the recipients interests is not a new one (e. g.

Scharl et al. 2005; Xu 2006). In a modern society with information overload problems for many people, advertising needs to be targeted and personalized in order to be effective. Product class involvement explained part of the variance of mobile ad intrusiveness perceptions significantly. As did the attitude towards advertising in general which was included to control for varying scepticism towards advertising within our sample. However, both effects as found in the analyses of covariance and the regression analyses were quite weak compared to those of the situation. Nevertheless, these findings emphasize the interpretations and derived consequences for advertisers given above.

## **7 Limitations**

The study has limitations. First, limitations arise from the study design. A surveybased approach was chosen for gathering data. The experimental character has been achieved by verbal presentations of situations and message types to the subjects. Thus, the evaluations were based on mentally constructed stimuli (Hoeffler 2003). Receiving a mobile ad in a real world setting might lead to reactions differing from those captured by our data. However, this limitation applies to most experimental study designs (Bryman & Bell 2007). Second, the results showed relatively low total variance explained. This indicates that other factors which were not included in our study are likely to influence perceptions of mobile ad intrusiveness. The design of situations and message types might not have been optimal either. In particular the variation of the message type regarding content type and product type might have caused unwanted bias. Descriptions could be reformulated and enhanced to provide for less variance in the subjects' interpretations of the experimental conditions that might have been present.

Finally, the data was gathered based on a non-probabilistic online snowball sample which was partially respondent-driven (Salganik & Heckathorn 2004). Generalizations are problematic on the basis of our data (Bryman & Bell 2007). The sample was relatively young and male respondents were in the majority. Gender and age effects could therefore be cause of further bias. Young users are particularly known for their intensive use of mobile devices for communication and socialization (Carroll et al. 2002), but no assumptions on the effects of age and gender on mobile ad intrusiveness appear feasible at this point. In order to increase external validity, other sampling methods should be applied in further research activities.

## **8 Conclusion**

This paper reports on a survey-based experimental study design which aimed at investigating the main effects of message type and situation on the perception of mobile ad intrusiveness. Two further variables, attitude towards advertising in general and ad relevance (here: product class involvement), were included in order to increase explanatory power. While message type was not found to contribute significantly to the explanation of mobile ad intrusiveness, the situation type showed a highly significant influence. Three of the four assumed relationships were found in the data.

The study contributes to the body of knowledge on mobile advertising effectiveness. Mobile ad intrusiveness has been introduced as possible measure for assessing the effectiveness of mobile ads. It is found to properly address

specific questions which arise with advertising effects in the mobile channel. The results of the study provide first insights into the relevance of situational context and message type for mobile advertising intrusiveness. Despite the study's limitations, some empirical evidence has been found for the medium's exceptional position among available marketing media and a need for thorough targeting of mobile advertising campaigns. However, the results of the study leave room for further research. Different methods could be deployed and the sampling approach could be modified. The study design can be refined and enhanced with other or additional variables that are assumed to contribute to the explanation of intrusiveness perceptions.

Ultimately, this study's value can be seen in the systematic approach to empirically assess the effects of the situational context and the message type on perceived ad intrusiveness. Other research approaches mainly built on field studies with subsequent interviews or focus group discussions. Furthermore, the dominating mode to assess mobile ad acceptance appears to be the measurement of attitudes towards mobile advertising in general and intentions to behave in a desired way (read/respond) (e. g. Tsang et al. 2004; Xu 2006). This study chose a different approach by using mobile ad intrusiveness as the central construct of interest. It has been validated in previous studies and found to be related to negative consequents of ad exposure (Edwards et al. 2002).

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