Children and advergames : the role of product involvement, prior brand attitude, persuasion knowledge and game attitude in purchase intentions and changing attitudes

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Children and Advergames: the effects of product involvement, prior brand attitude, persuasion knowledge and game attitude on purchase intention and brand attitude

Abstract

The central aim of this study is to build upon previous research by investigating the role of product involvement, prior brand attitude, persuasion knowledge and game attitude in the brand attitude changes and purchase intentions of children after playing an advergame. In all, 279 respondents between the ages of 10 and 12 years participated in the study. First, they were asked to complete a pre-test survey addressing product involvement and prior brand attitude towards several products and brands. Two weeks later, the respondents were asked to play an advergame and complete a survey addressing brand attitude, purchase intention, persuasion knowledge and attitude towards the game. Our analysis reveals that a positive attitude change is more likely when the game player has already evaluated the brand positively. Furthermore, game attitude is positively related to attitude changes towards the advertised brands, consistent with affect transfer theory. Counterintuitively, a higher level of persuasion knowledge is associated with a higher intention to buy the advertised product. Finally, children who had a more positive attitude towards the game were more likely to report higher purchase intentions, indicating that games which provide good experiences positively influence behavioural intentions. We conclude the paper by discussing the study's limitations and suggestions for future research.

1. Introduction

Researchers have questioned the appropriateness of advergames for children (e.g. An and Stern 2011; Mallinckrodt and Mizerski 2007), as they may challenge children's ability to understand the persuasive intentions of the advertiser. One research report states that advergames are among the five most commonly used advertising strategies to reach children aged 7–12 years (Cauberghe *et al.* 2012). Advergames are defined as 'interactive online games embedded with brand messages' (An and Stern 2011, p. 43). They are specifically designed for marketing a single brand or a particular product (Cauberghe and De Pelsmacker 2010). In most cases, both the design of the advergame and the actual gameplay are simple (Winkler and Buckner 2006). Despite the ease of play, these games are capable of holding children's attention for several minutes (Hofmeister-Tóth and Nagy 2011). Research has shown that children can be reached easily by advergames on popular gaming websites (Soontae & Kang 2014). Therefore, advergames thus provide a unique platform through which marketers can target children (An and Stern 2011).

Unlike traditional advertising formats, persuasive messages in advergames are integrated into immersive, highly involving and amusing environments, blurring the boundaries between entertainment and advertising (An and Stern 2011; Rifon *et al.* 2014; Van Reijmersdal *et al.* 2012; Waiguny *et al.* 2012). This makes advergames difficult for children to process. Processing an advergame consists in two tasks: the primary task relates to obtaining high scores in the game, while the secondary task involves processing the advertising message (Rifon et al., 2014). Since processing the advertising is the secondary task, the real intent of these games is often difficult for children to recognise and understand. To assist children in recognising and understanding embedded advertising such as advergames, researchers have called for the use of disclosure cues (Boerman *et al.* 2012). Yet a recent content analysis of gaming sites revealed that only 10% of advergames actually alerted users to their persuasive nature (Soontae & Kang 2014). For the abovementioned reasons, and especially because embedded forms of advertising often rely on low cognitive elaboration (Buijzen *et al*. 2010), it can be difficult for young consumers to activate their consumer defences and use their persuasion knowledge. Several empirical studies have already confirmed that children have difficulty identifying the source of advergames (An and Stern 2011; Mallinckrodt and Mizerski 2007) and their persuasive intentions (Panic *et al* 2013). Studies which explicitly compared children's persuasion knowledge of traditional (e.g. television advertising) and embedded forms (e.g. advergames) of advertising have revealed that children find it more difficult to understand the nature of the latter (Panic *et al.* 2013; Waiguny *et al.* 2014).

As the main goal of advergaming is to improve children's attitude towards a brand, previous studies focused mainly on children's attitudinal responses to advergames (Waiguny *et al.* 2012). The results

of such studies reveal that brand prominence and game involvement influence children's attitudinal responses to advergames (Van Reijmersdal *et al.* 2012). Research has also established that playing advergames affects children's brand recognition, attitude towards the brand, brand taste and brand requests (Rifon *et al.* 2014). To date, however, no studies have addressed the possible influence of prior brand attitude and product involvement. Investigating prior brand attitude and product involvement in the context of children and advergaming is important, as these aspects are associated with consumer responses to advertising (Suh and Yi 2006; Phelps and Hoy 1998). Understanding how children respond to advergaming could foster the development of more appropriate marketing policies and interventions designed to help children understand hybrid forms of advertising (Van Reijmersdal *et al.* 2012).

The central aim of this study is therefore to build upon previous research by investigating the role of product involvement, prior brand attitude, persuasion knowledge and game attitude in the brand attitude changes and purchase intentions of children. We address several gaps in the existing literature. First, to the best of our knowledge, no previous study of children's responses to advergames has used a pre-measurement of brand attitude to investigate changes in brand attitude after playing an advergame. This pre-measurement is important, because it will provide a clearer picture of how brand attitudes might be changed by playing an advergame (Van Reijmersdal *et al.* 2012).

Second, previous studies investigating children's responses to advergames did not consider differences in product involvement. Yet research on other types of advertising has shown that product involvement influences children's purchase intentions (Te'eni-Harari *et al.* 2009). A related issue is that previous studies on advergaming often focused on a single product or brand. As pointed out by Wise *et al.* (2008), however, it is likely that playing an advergame produces different advertising outcomes for different brands and products. Investigating multiple brands and products in one study may be meaningful, especially since both brand attitude and product involvement can affect the way advertising is processed (Cauberghe and De Pelsmacker 2010; Suh and Yi 2006). The importance of product type has also been highlighted by Soontae & Hang (2014), who call for more experimental research on children and advergaming.

Third, existing research in this area focuses primarily on attitudinal responses (e.g. Van Reijmersdal *et al.* 2012; Waiguny *et al.* 2012), despite the fact that advergames might also influence behaviour and behavioural intentions (Van Reijmersdal *et al.* 2012). Measurements of the direct effects on behaviour of online advertising such as advergaming remain scarce (Shin *et al*. 2012). Previous studies focused on requests for advertised products, brand preferences and pestering intentions (e.g. Mallinckrodt and Mizerski 2007; Waiguny *et al.* 2013). Yet, in addition to influencing their parents, children themselves also have direct purchasing power through discretionary incomes (e.g. allowance) (Marshall 2010; Calvert 2008). This study therefore focuses on purchase intention – children's intention to buy an advertised brand.

Fourth, existing research on children and advergaming has investigated either persuasion knowledge or advertising effects (Rozendaal *et al*. 2009). As noted by Tutaj and Van Reijmersdal (2012), however, studies on persuasion knowledge do not often include advertising effects, which makes it difficult to determine how persuasion knowledge is related to advertising outcomes. For example, additional research is necessary to uncover the possible role that persuasion knowledge plays in the behavioural responses of children (Van Reijmersdal *et al.* 2012). Here, we address this issue by including persuasion knowledge in our investigation of children and advergaming. We also include advertising effects, focusing on both purchase intentions and changes in brand attitudes.

Finally, we elaborate on previous research by investigating children's attitudes towards advergaming. Measuring children's game attitude is relevant because attitude towards an advergame game is known to influence other affective reactions (e.g. brand attitude) and behavioural intentions (e.g. pester intention) (Waiguny and Terlutter 2011). The central aims of this study can be summarised as follows:

(1) To investigate how the *affective* responses (i.e. brand attitude changes) of children aged 10–12 years differ after playing an advergame depending on product involvement, brand attitude, persuasion knowledge and game attitude.

(2) To examine how the *behavioural intentions* (i.e. purchase intention) of children aged 10–12 years differ after playing an advergame depending on product involvement, brand attitude, persuasion knowledge and game attitude.

2. Literature review

2.1 Affective response to advertising: brand attitude change

Brand attitude can be used as a measure of ad effectiveness (Te'eni-Harari *et al.* 2009). It is perceived as an affective response to advertising (Van Reijmersdal *et al.* 2012). Advergames are believed to create more positive brand attitudes towards the brands integrated in the gameplay (Rifon *et al.* 2014). Previous research on brand attitudes and advergaming tended to measure brand attitude only after exposure to advergames (e.g. Choi and Lee 2012; Rifon *et al.* 2014; Van Reijmersdal *et al.* 2012; Waiguny *et al.* 2012). These studies were able to investigate between-group differences in brand attitude, but failed to indicate how individual respondents' attitudes might have changed while playing. In our study, we therefore measure brand attitude both before and after playing and subsequently calculate brand attitude change. This method enables us to draw conclusions about whether advergames achieve their goal, namely to influence brand attitude positively. More specifically, we formulate the following research question:

RQ1: Does playing an advergame lead to a positive attitude change among children?

The model most commonly associated with attitude change is the Elaboration Likelihood Model (ELM) developed by Petty and Cacioppo (1986). According to this model, attitude is seen as a general opinion that people have of themselves, other people, objects and issues (Petty and Cacioppo, 1986). In an earlier study, Petty, Cacioppo and Schumann (1983) describe two routes to changing attitudes about an object. Attitude changes that occur along the first route (i.e. the central route) are the result of profound consideration (Petty *et al.* 1983). Those occurring along the second route (i.e. the peripheral route) are not based on thorough consideration of the advantages and disadvantages of the situation (Petty *et al.* 1983), but on the association of the object with positive or negative cues within the context of persuasion (Petty *et al.* 1983). For example, in the latter situation, an individual might accept an argument because it is presented in a pleasant way (Petty *et al.* 1983). In the context of advergaming, playing an entertaining advergame might have a positive effect on the player's attitude towards the advergame itself, and this effect might then be carried over to the brand (Waiguny and Terlutter 2011). Buijzen *et al*. (2010) describe a third elaboration process, known as the automatic process, in which attitude change occurs without awareness or knowledge of the persuasive nature of the communication. This route is based on the heuristic systematic model (Buijzen *et al.* 2010) and is in fact very similar to the peripheral route of the ELM, as both processing routes rely on less elaborate, less thoughtful processing (Petty *et al.* 1983).

Because children are still developing, adult persuasion models such as the ELM should not be applied directly to young children's persuasion processing (Buijzen *et al*, 2010; Te'eni-Harari *et al.* 2013). Children are more likely to use less elaborate processing routes (Buijzen *et al* 2010), for example. We might expect this to be especially true when it comes to embedded types of advertising. Highly embedded forms of advertising (e.g. advergaming) often rely on the automatic persuasion route, since children's persuasion knowledge of subtle forms of advertising is not sufficiently activated (Buijzen *et al*. 2010). One study of the ELM conducted among children aged 4-15 years concluded that children follow neither the central nor peripheral route, but take a path between the two. In other words, when it comes to children, the authors view the Elaboration Likelihood Model not as two different categories, but as a spectrum (Te'eni-Harari, 2007). This conclusion was reached because no differences were found between high and low involvement for several variables, such as brand attitude and purchase intent. However, the researchers simulated children's involvement by means of situational involvement, which can be promoted using stimuli (e.g. promising a gift) (Cauberghe and De Pelsmacker, 2010; Te'eni-Harari *et al.* 2007). Following Cauberghe and De Pelsmacker (2010), we operationalise product involvement as an enduring type of involvement that remains stable across conditions and situations.

2.2 Behavioural intentions after advertising exposure: purchase intention

Purchase intention is another measure of advertising effectiveness and is often used by studies conducting empirical investigations of consumer behaviour after being exposed to advertising stimuli. This trend has its roots in the theory of reasoned action (see Fishbein 1979 for a detailed description), which states that a person's intention to perform certain behaviour is a strong predictor of his or her actual behaviour (Ajzen 1991). This can be applied to purchase intention and purchase behaviour: the stronger a person's intention to purchase an item, the more likely it is that he or she will actually buy it. The elaboration process may also affect behaviour and behavioural intentions (Buijzen *et al*. 2010). Several studies have investigated children's behavioural intentions in relation to advertising (e.g. Rifon *et al.* 2014; Te'eni-Harari 2009; Panic *et al.* 2012; Waiguny and Terlutter, 2011). For example, in an experiment among girls aged 11–17 years, Van Reijmersdal (2010) reports that girls playing a game that included brand placement showed a higher intention to buy than did those who did not encounter a brand during the game. Other studies have confirmed that actively playing an advergame has an effect on purchase request intentions (Rifon *et al.* 2014). Advergaming research focusing on the issue of brand preference have also established that advergaming can influence children's preferences (e.g. Harris *et al.* 2011; Mallinckrodt and Mizerski, 2007; Dias and Aganta 2010).

As mentioned above, the goal of this paper is to investigate how the *affective* responses (i.e. brand attitude change) and *behavioural* intentions (i.e. purchase intention) of children aged 10–12 years differ after playing an advergame depending on product involvement, brand attitude, persuasion knowledge and game attitude. In what follows, we elaborate further on why we expect these aspects to be related to affective and behavioural responses.

2.3 Hypotheses

As defined by Zaichkowsky (1985), **product involvement** is the perceived personal relevance of a product based on an individual's needs, values or interests. Product involvement is known to influence the ways in which consumers process advertising (Cauberghe and De Pelsmacker 2010; Suh and Yi 2006). For example, it is believed that consumers put more effort into processing information linked to high-involvement products than they do for low-involvement products (Cauberghe and De Pelsmacker 2010). While product involvement has been investigated in the context of adults and advergames (Cauberghe and De Pelsmacker 2010), this has yet to be done for children. Several scholars have addressed the issue of product involvement and children using other types of advertising (e.g. Muratore 2003; Te'eni-Harari *et al* 2009). For example, Te'eni-Harari *et al.* (2009) report that the effectiveness of printed advertisements is positively influenced by a child's level of product involvement.

It is reasonable to assume that different product types might have different effects on affective reactions to advertising (Gross 2010; Choi and Lee 2012), including attitude change. The ELM (Petty and Cacioppo 1986) offers a partial explanation. The purchase of low-involvement products entails

fewer risks, thus requiring less thorough elaboration, while high-involvement products are riskier and thus tend to be evaluated more critically before purchase (Gross 2010). As established in a recent study on adults, product involvement has a positive effect on brand attitude (Chen and Leu 2011). While adult persuasion models are not entirely applicable to children, it can be assumed that product involvement plays a similar role in children's persuasion processes (Te'eni-Harari *et al.*2013).

Previous studies of printed advertisements and TV commercials confirm that product involvement affects the brand attitudes of children (Te'eni-Harari 2009; Te'eni-Harari 2013). As reported by Te'eni-Harari *et al.* (2009), the attitudes of children viewing a printed ad that featured a high-involvement product were significantly more positive towards the advertised brand compared to a low-involvement product (Te'eni-Harari *et al.* 2009). This suggests that advertisements for products that are relevant to and meaningful for children (high-involvement products) are more likely to affect their attitudes than are advertisements for other products (Te'eni-Harari *et al.* 2009).

Te'eni-Harari *et al.* (2009) established that product involvement also influences children's purchase intentions. Children who had a high level of involvement with an advertised product were significantly more inclined to buy it. The authors therefore argue that product involvement plays an important role in predicting the purchase intentions of children. However, a later study by Te'eni-Harari (2013) found no support for the effect of product involvement on purchase intent.

The following hypotheses are derived from the research mentioned above:

H1a: Children who play advergames featuring high-involvement products are likely to report higher levels of positive brand attitude change compared to children who play advergames featuring low-involvement products.

H1b: Children who play advergames featuring high-involvement products are likely to report higher levels of purchase intention compared to children who play advergames featuring low-involvement products.

Prior brand attitude is defined as an individual's attitude towards a brand before he or she is exposed to an advertising stimulus (Phelps and Hoy 1998, p. 90). We might expect prior brand attitude to influence a consumer's attitudinal and behavioural responses after being exposed to an advertising stimulus, as it appears that a consumer who already has a favourable attitude towards a brand is less likely to be critical of advertising for this brand (Chattopadhyay and Basu 1990). Therefore, the elaboration result is likely to be positive. One study has investigated this effect for in-game advertising among young adults (Mau *et al.* 2008). In that study, it was assumed that prior brand attitude influences brand attitude after game play. The results showed that, when it came to in-game advertising, prior brand attitude did indeed have the greatest impact on brand attitude after playing the game. Similarly, previous research on advertising and children suggests that children's prior brand

attitudes have a positive effect on their brand attitudes after viewing an advertising stimulus (Phelps and Hoy 1998).

As a result, we opted to differentiate between products that children evaluated positively and products that received a neutral evaluation. This led to the following hypothesis:

H2: Children who play advergames featuring brands previously evaluated as positive are likely to report higher levels of positive brand attitude change than are children who play advergames featuring brands that received a neutral evaluation.

Persuasion knowledge is the knowledge an individual needs to identify and understand persuasive intentions (Friestad and Wright 1994). One common theory regarding the ways in which children process advertising is the Persuasion Knowledge Model (Friestad and Wright 1994), which states that children acquire essential insights throughout childhood and adolescence, gradually developing persuasion knowledge (Friestad and Wright 1994) that ultimately reaches adult levels (Wright *et al.* 2005). This knowledge is relevant to advergames, given the assumption that it assists consumers in evaluating persuasion attempts in communications such as advertising (Friestad and Wright 1994). Most research on persuasion knowledge focuses on television advertising, however (e.g. Bijmolt *et al.* 1998; Oates Blades and Gunter 2001; Rozendaal *et al.* 2010). In addition, persuasion knowledge has often been connected with cognitive development theory, which states that older children are more capable of understanding advertising and its purpose (Moore 2004). This is because children develop certain skills over time, including the ability to distinguish advertising from non-commercial content (John 1999; Moore 2004; Rozendaal *et al.* 2010) and the ability to understand the persuasive intent of such content. Research provides evidence that children younger than eight years have difficulty understanding the selling and persuasive intent of television advertising (Kunkel *et al.* 2004; Rozendaal *et al.* 2010) and that many ten-year-olds may not fully grasp the purpose of television advertising (Oates *et al.* 2001). This suggests that children may also have difficulty understanding other types of advertising (e.g. internet advertising).

It is often assumed that children who have better persuasion knowledge are better equipped to understand advertising (Soontae and Kang 2014). Several scholars have examined the influence of persuasion knowledge on brand attitudes (e.g. Van Reijmersdal *et al.* 2012; Waiguny *et al.* 2012). In a study of children aged 7–12 years, Van Reijmersdal *et al.* (2012) found that persuasion knowledge had no influence on affective responses (e.g. brand attitude and game attitude). This finding implies that, even if children do possess knowledge regarding the game's intention, they do not use this understanding to develop a more critical response to the advertising in the game. Waiguny *et al.* (2012) also addressed advergaming and brand attitudes, reasoning that persuasion knowledge might generate more negative brand attitude outcomes. After conducting a survey amongst children aged 7–

10 years, they reported that the activation of persuasion knowledge has a negative effect on brand attitude.

The few studies that have addressed children's persuasion knowledge and purchase intentions with regard to advergaming suggest that persuasion knowledge does not influence the behavioural responses of children. Panic *et al.* (2013) compared the influence of persuasion knowledge on both television advertisements and advergames, concluding that persuasion knowledge does not appear to influence the behavioural intentions of children. This finding contradicts the results obtained for television advertisements (Panic *et al.* 2013), which indicate a significant relationship between persuasion knowledge and behavioural intentions.

In the present study, we operationalise persuasion knowledge as children's ability to understand the persuasive and selling intent of advertising. This concept is similar to that used in other studies of persuasion knowledge and advertising (e.g. Tutaj and Van Reijmersdal 2012). Based on the PKM framework, we hypothesise that:

H3a: Children who have a high level of persuasion knowledge are likely to report lower levels of positive brand attitude change than are children who have a low level of persuasion knowledge.

H3b: Children who have a high level of persuasion knowledge are likely to report lower levels of purchase intention than are children who have a low level of persuasion knowledge.

The final potentially important predictor of attitudinal changes and behavioural responses addressed in this study is **game attitude**. Various studies in advertising research have argued that an individual's attitude towards the advertisement itself has an important influence on his or her brand attitude (MacKenzy *et al*. 1986; Mau *et al*. 2008). This can be explained by affective processing mechanisms such as affect transfer, which involves a consumer's attitude towards an advertisement being transferred to the brand (MacKenzy *et al*. 1986). In the context of advergames, this means that playing a game and having a positive attitude towards the game might have a positive influence on brand attitude (Rifon *et al.* 2014; Wise *et al*. 2008). Affect transfer is an example of low-level cognitive elaboration and is based on classical conditioning (Tuten and Ashley 2013). It is believed that game attitude can also evoke this type of mechanism (Wise *et al.* 2008), as research has shown that a positive attitude towards a game can be transferred to brand attitude (Waiguny and Terlutter 2011): while playing, the positive feeling towards the game is associated with the brand and afterwards, when the brand is seen out of the gaming context, the positive feeling is remembered (Waiguny *et al.* 2012). This requires only the lowest level of elaboration (Van Reijmersdal *et al.* 2014). Children have been found to be especially sensitive to affect transfer (Van Reijmersdal *et al.* 2012). With regard to children and advergaming, in particular, one experiment conducted amongst children aged 7–12 years demonstrated that the effect of game involvement on cognitive responses (e.g. brand recall and recognition) and affective responses (brand attitude) was mediated by game attitude. In another study

on advergaming, the positive attitudes of children aged 9–12 years towards the brand and their intention to perform pestering behaviour were found to be higher among those who had found the game enjoyable (Waiguny and Terlutter 2011).

In this study, we build further on the findings of Van Reijmersdal and colleagues (2012) and of Waiguny and Terlutter (2011) by including a pre-measurement of brand attitude. This allows us to investigate whether the affect transfer mechanism of game attitude is applicable to attitude change. In addition, we investigate whether purchase intention is influenced by a positive attitude towards the game. We therefore hypothesise that:

H4a: Children with positive game attitudes are likely to report higher levels of positive brand attitude change than are children with negative game attitudes.

H4b: Children with positive game attitudes are likely to report higher levels of purchase intention than are children with negative game attitudes.

3. Method

In order to test our hypotheses, we performed an experimental study. Participants were asked to play an advergame. In this game, we manipulated product involvement (low/high) and prior brand attitude (neutral/positive). Two other independent variables, namely persuasion knowledge and game attitude, were measured as continuous variables (see below). Prior to the experiment, all materials (games and questionnaires) were tested for comprehensibility.

3.1 Stimulus material

Based on existing advergames, we modified an adaptable Flash game template for a platform game (see Figure 1). The goal of the game was to capture blocks. Brand images were integrated throughout the game, giving the impression that the game had been built specifically for the brand. This procedure is consistent with the way in which advergames are described in the literature (e.g. An and Stern 2011; Cauberghe and De Pelsmacker, 2010). Similar platform games are also used in real-life advergames (e.g. the Dr. Oetker advergame).

Following the selection of four brands during a pre-measurement phase that assessed children's product involvement and prior brand attitude, four versions of the game were developed. The game narrative was general and therefore fitted all four brands. Aside from the use of different brands, the game remained the same in all four versions. The above-mentioned pre-measurement was carried out at two predetermined points in time, with the measurements obtained at Time 1 providing information for Time 2 (see below).

3.1.1 Pre-measurement at Time 1: Selecting one low- and one high-involvement product

At Time 1, we sought to identify products that children aged 10–12 years perceived as low-involvement (LI) and high-involvement (HI) products. We asked 50 pupils to score a list of 16 possible product categories (see Table 1 for an overview). Product involvement was measured using the 10-item scale developed by Zaichkowsky (1994). The 7-point semantic differential scale consisted of ten items of bipolar adjectives (important/unimportant, boring/interesting, relevant/irrelevant, exciting/unexciting, means nothing/means a lot to me, appealing/unappealing, fascinating/mundane, worthless/valuable, involving/uninvolving, not needed/needed). From each product category, we selected the brands with the widest differences in product involvement scores: coffee (LI, M=2.04; SD=1.37), soup (LI, M= 2.34; SD= 1.25), computers (HI, M=5.80; SD= 1.07) and mobile phones (HI, M=5.99; SD= 0.98). A paired-samples T-test revealed that coffee was a low-involvement product, unlike mobile phones and computers, which were identified as high-involvement products ($t(48)= -15$, $p < 0.01$ and $t(48)= -17$, $p < 0.00$ respectively). Soup was also found to be a low-involvement product compared to mobile phones ($t(48)= -17$, $p < 0.01$) and computers ($t(48)= -17$, $p < 0.00$).

Insert Table 1 about here

3.1.2 Pre-measurement at Time 2: Selecting one neutral and one positive prior attitude brand

At Time 2 (three days after Time 1), our goal was to select appropriate brands (i.e. one neutral-attitude brand and one positive-attitude brand) for each category of product involvement. Pupils were given a list of 24 brands offering products in four different product categories (i.e. coffee, soup, computers and mobile phones), selected on the basis of the results obtained at Time 1 (see above). The respondents were asked to evaluate the brands using a scale developed by Putrevo and Lord (1994), which consists of five 7-point items (e.g. 'Buying (brand) is a good decision'). In order to enable an accurate estimate of brand attitude, the children were asked to rate only the brands they recognised. After analysing the results, we selected the brands with the widest differences in brand attitude scores within the coffee and mobile phone product categories (see Table 2 for an overview): Nescafé (coffee: M= 4.32; SD= 1.73) and Oxfam (coffee: M= 5.37, SD= 1.45); and Sony Ericsson (mobile phone: M= 4.97; SD= 1.80) and Apple (mobile phone: M= 6.42, SD= 0.87). For each pair, a paired-samples T-test was used to assess differences in brand attitude. For the low-involvement product (coffee), the Oxfam and Nescafé scores were found to differ significantly ($t(25)= 2.26$, $p < 0.05$). Similar results were obtained for the high-involvement products (mobile phones: Sony Ericson versus Apple, t (24)= 3.37, $p < 0.005$). Although we chose the two pairs of brands which had the widest differences in brand attitude scores, the lowest-scoring brands still scored above 3.5 on the 7-point-scale, though lower than 5. We found it appropriate to refer to these brands as neutral-attitude brands rather than negative-attitude brands.

Insert Table 2 about here

Based on the pre-measurements performed at Times 1 and 2, we selected four brands: Nescafé coffee (low product involvement, neutral prior brand attitude), Oxfam coffee (low product involvement, positive prior brand attitude), Sony Ericsson phone (high product involvement, neutral prior brand attitude), and Apple phone (high product involvement, positive prior brand attitude).

3.2 Participants

During the experiment itself, data were gathered from children (aged 10-12 years) in a classroom environment. In all, 279 children took part in the experiment (47.8% boys; 52.2% girls). The mean age of the respondents was 11.03 years.

Our study was part of a larger project on children and online advertising. Prior to data collection, we obtained approval from the University's Ethics Committee [registration number removed for purposes of blind review] and from the schools' teachers and headteachers. We also obtained informed consent from the parents and from the children themselves.

3.3. Procedure

The data collection took place in two phases, which allowed us to measure prior brand attitude without priming the children with the brands. Phases 1 and 2 were presented to the children as two separate studies and were also administered by different researchers to further prevent priming. The setting was also different: Phase 1 took place in the children's classroom, while Phase 2 was administered in a school computer lab.

3.3.1 Phase 1 of the experiment

The first phase, which was administered two weeks before the game was played, was designed to test product involvement and brand attitude for the products and brands selected in the pre-measurement phases. We asked the children to rate the two different product categories (i.e. coffee and mobile phones) and the four possible brands (i.e. Sony Ericsson, Apple, Nescafe, Oxfam). First, the children were asked to indicate their product involvement with regard to the two products using the 10-item scale developed by Zaichkowsky (1994) (see above). Afterwards, the children were shown the four brand logos and asked to indicate their brand attitude using the scale developed by Putrevo and Lord (1994). In addition, several bogus questions were added to ensure that the pre-measurements did not influence Phase 2.

As mentioned above, the aim of this phase was to gather data on the between-subject variables of product involvement (low/high) and prior brand attitude (positive/neutral). Using these data, we performed two manipulation checks. All participants were asked to complete Zaichkowsky's (1994) product involvement inventory (see above). Comparing the two product categories (coffee and mobile phones), we performed a paired-samples T-test. The results indicated that participants considered

coffee to be a low-involvement product (*M*= 2.16, *SD*= 1.32) and mobile phones a high-involvement product (*M*= 5.72, *SD*= 1.43; *t*(*t*(264)=31, p= 0.000.)

We took a similar approach to brand attitude. In the first phase, participants were asked to complete the brand attitude scale developed by Putrevo and Lord (1994). We then compared both the low-involvement and the high-involvement brands. For coffee, a paired-samples T-test (*t*(174)=-6.63, p= 0.000) confirmed that Nescafé (*M*= 4.14; *SD*= 0.80) was a neutral-attitude brand compared to Oxfam (*M*= 4.64, *SD*= 0.66). Similarly, for mobile phones, a paired-samples T-test (*t*(218)= 11.0, p= 0.000) confirmed that Sony Ericsson (*M*= 4.57, *SD*= 0.89) was a neutral-attitude brand compared to Apple (*M*= 5.39, *SD*= 0.66), which was identified as a positive-attitude brand.

Both manipulation checks indicated significant differences between the two groups, suggesting that our manipulation checks were successful.

3.3.2 Phase 2 of the experiment: main study

In the main study, we invited the participants to play an advergame for five minutes. The children were randomly assigned to one of the four advergames. The four conditions were: low product involvement and neutral prior brand attitude (coffee, Nescafé; *n*=63); low product involvement and positive prior brand attitude (coffee, Oxfam; *n*=64); high product involvement and neutral prior brand attitude (mobile phone, Sony Ericsson; *n*=66); and high product involvement and positive prior brand attitude (mobile phone, Apple; *n*=70). For 16 respondents, we were unable to link data between Phases 1 and 2. After playing the game, the participants were invited to complete an anonymous questionnaire (see measurements). In order to measure brand attitude change, the children were asked to indicate their attitude towards the brand shown in the advergame they played. This means that in Phase 2, only one brand was included in this questionnaire. Finally, the participants were debriefed about the purpose of the study.

3.4 Measurements

Brand attitude change. Brand attitude change was measured by calculating the difference between brand attitudes in Phases 1 and 2. In both phases, brand attitude was measured using a 5-item scale developed by Putrevo and Lord (1994). All items were measured along a scale ranging from 1 (strongly disagree) to 5 (strongly agree). Examples of items include ‘Buying (brand) is a good decision’ and ‘I think (brand) has a lot of beneficial characteristics’. In Phase 1, the scale proved adequately reliable for all four brands, with Cronbach’s alpha scores of .84 (Apple), .90 (Sony Ericsson), .84 (Oxfam) and .80 (Nescafé). The scale also proved adequately reliable for all four brands in Phase 2, with Cronbach’s alpha scores of .81 (Apple), .87 (Sony Ericsson), .89 (Oxfam) and .80 (Nescafé). Mean scores were used to calculate the differences between Phases 1 and 2. With regard to the hypotheses on brand attitude change, children were asked to rate only the brands they recognised

(*n*= 216). Any participants who had not recognised the brand used in their version of the advergame in Phase 1 were excluded from further analysis of brand attitude change.

Purchase intention. Purchase intention was measured using a self-constructed scale consisting of three items (e.g. 'I would like to buy a product from brand X'), rated along a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). With a Cronbach's alpha score of 0.87, the scale proved adequately reliable. Mean scores were used in further analyses.

Persuasion knowledge. In line with previous research (An and Stern 2011; Tutaj and Van Reijmersdal 2012; Rozendaal Buijzen and Valkenburg 2010), the children's ability to understand the intent of advergaming was measured using an 8-item scale. Four items referred to selling intent (e.g. 'the aim of this game is to sell this product') and four items referred to persuasive intent (e.g. 'the creator of this game wants to influence my ideas about this product'). All items were measured along a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). This persuasion knowledge scale proved adequately reliable (Cronbach's alpha score= 0.84, *M*= 3.1, *SD*= 0.90)

Game attitude. Game attitude was investigated using a measure of attitudes toward advertisements that has been used in previous research on advertising and advergames (Yoon *et al* 1998; Wise *et al*. 2008). This 7-point semantic differential scale consisted of six items composed of bipolar adjectives (appealing/unappealing, pleasant/unpleasant, dynamic/dull, attractive/unattractive, enjoyable/not enjoyable and refreshing/depressing).

4. Results

4.1 Brand attitude change

RQ1 focused on the attitudinal change after playing the advergame. In total, 22% of the respondents underwent a negative attitude change, while 69% of the respondents' attitudes towards the brand changed positively. For 9% of the respondents, no change was observed in their attitude towards the advertised brand after playing the game.

Chi-square analysis revealed that these three groups (positive change, negative change, no change) did not differ significantly in terms of product involvement ($\chi 2$ (2) = .28, p = .869). For prior brand attitude, on the other hand, Chi-square analysis did reveal a significant difference ($\chi 2$ (2) = 8.99, p = .011): the negative attitude change group contained a higher percentage of respondents who had had a neutral prior brand attitude (66%) compared to the positive attitude change group (43%).

To investigate whether the negative attitude change group differed from the other two groups (i.e. no change and positive attitude change) with regard to persuasion knowledge and game attitude, we

performed two ANOVAs. No significant between-group difference was found for persuasion knowledge $F(1,215) = .59$, $p = .555$). Game attitude was found to have been more favourable among children whose attitudes changed positively ($M = 4.83$; $F(1,215) = 26.46$, $p = .002$) than among children whose attitudes changed negatively ($M = 3.98$).

Table 3 summarises the mean scores for each group.

Insert Table 3 about here

In order to investigate our hypotheses, we used a regression approach. Regression analyses are useful in experiments, especially when continuous factors with more than two levels are included (Ledolter and Swersey 2007). The experimental conditions are taken into account by adding them as dummy-variables. A hierarchical regression analysis was carried out with brand attitude change as a dependent variable; the four independent variables were product involvement (dummy variable: 0= low involvement/1= high involvement), prior brand attitude (dummy variable: 0= neutral brand attitude/1= positive brand attitude), persuasion knowledge (mean-centred) and game attitude (mean-centred). Product involvement and attitude towards the brand were entered first, followed by persuasion knowledge and game attitude. We also included three interaction terms: game attitude*persuasion knowledge, game attitude*prior brand attitude and prior brand attitude*product involvement. As shown in Table 4, none of the interaction terms (Step 3) were found to be significant. In addition, the R^2 change from Step 2 to Step 3 was small (.02). We therefore selected the regression model used in Step 2 as our final model.

Insert Table 4 about here

Hypothesis 1 investigated whether the degree of product involvement (low/high) influenced the level of attitude change after game play, but this was not found to be significant. Therefore, the results do not support H1. Hypothesis 2 stated that the level of attitude change would differ depending on whether prior brand attitude was neutral or positive. Our results indicate that prior brand attitude is indeed a significant predictor of attitude change caused by playing an advergame, thereby confirming H2. This means that children who played an advergame that includes a brand towards which they have a positive prior brand attitude generally reported higher levels of brand attitude change. H3a concerned the effect of persuasion knowledge on attitude change. The analysis did not identify persuasion knowledge as a significant predictor of attitude. Finally, H4a stated that the level of attitude change would be influenced by a child's game attitude. This association was found to be significant, indicating that the degree of attitude change was positively influenced by the child's attitude towards the game.

4.2 Purchase intention

A second hierarchical regression analysis was carried out using purchase intention as the dependent variable and the same four independent variables: product involvement (dummy variable: 0= low involvement/1= high involvement), prior brand attitude (dummy variable: 0= neutral brand attitude/1= positive brand attitude) persuasion knowledge and game attitude. Although the relationship between prior brand attitude and purchase intention had not been built into a hypothesis, we were able to include this in the analysis due to the experimental design. Game attitude and persuasion knowledge were mean-centred. In line with the first hierarchical regression, product involvement and attitude towards the brand were entered in Step 1, while persuasion knowledge and game attitude were added in Step 2. Finally, in Step 3, interaction terms were added: game attitude*persuasion knowledge, game attitude*prior brand attitude and prior brand attitude*product involvement. Table 5 summarises the results of this analysis. Step 3 was used as our final model. The final regression equation demonstrated an adjusted R^2 of .37.

Contrary to the expectations formulated in H1b, product involvement was not a significant predictor of purchase intention. Prior brand attitude was found to be a positive predictor of purchase intention, however. Although product involvement did not significantly influence purchase intention, we did find the interaction term product involvement*prior brand attitude to be significant. More specifically, children who played a game that included a low-involvement product from a neutral-prior-attitude brand scored 3.65 on purchase intention, on average, while children playing a game that included the same low-involvement product but from a positive-prior-attitude brand reported an average of 3.75. Children who played a game that included a high-involvement product from a neutral-prior-attitude brand reported a score of 4.03 on purchase intention, on average, while children playing a game that included a low-involvement product, albeit from a positive-prior-attitude brand, reported an average purchase intention score of 5.96. This suggests that the impact of prior brand attitude is greater for games centred around high-involvement products. With regard to H3b, we found a positive relationship between persuasion knowledge and purchase intention. This indicates, counterintuitively, that children with higher levels of persuasion knowledge of advergames generally have higher purchase intentions towards the products advertised in advergames. Finally, game attitude was found to be a significant predictor of purchase intention, thus supporting H4b. This means that children who had more positive attitudes towards the game also had higher purchase intentions.

Insert Table 5 about here

5. Discussion

This study aimed to investigate the affective (i.e. brand attitude change) and behavioural intention (i.e. purchase intention) of children after playing an advergame. Our findings contribute to the current literature in several ways. First, we included prior brand attitudes as a factor in our experiment on children and advergames. The brand attitude measures in most studies on advergaming and children are taken only after exposure to the advergame. The inclusion of prior brand attitude allows the investigation of brand attitude changes occurring after children have played an advergame. Second, in addition to brand attitude change, we include purchase intention as a behavioural intention measurement, given that many prior studies have often focused on other types of responses, including cognitive and affective responses (e.g. Van Reijmersdal *et al*. 2012; Waiguny *et al.* 2012). The inclusion of purchase intention in our study allows for the investigation of whether product involvement, prior brand attitude, persuasion knowledge and game attitude play a role in children's intention to purchase advertised products after playing advergames.

Through brand placements in games, marketers often aim to improve brand attitudes (Terlutter & Capella 2014). By calculating the attitude change after playing the game, we were able to investigate whether an advergame achieved this goal. Our study showed that playing an advergame does not necessarily lead to an improved attitude towards the advertised brands. In some cases, children's brand attitude was even lowered after game play. Based on our analyses, we believe that players' attitude towards the game is crucial for an advergame's effectiveness. Furthermore, a positive brand attitude change is more likely to occur for brands previously evaluated as positive. In addition, the results of this study further demonstrate that brand attitude change in children who played an advergame featuring a brand previously evaluated as neutral differs from that of children who played an advergame featuring a brand previously evaluated as positive. A similar effect was found for purchase intention. These results suggest that prior brand attitude is an important factor in the effectiveness of advergames aimed at children. Contrary to our expectations, the same level of change in brand attitude and purchase intention was produced by advergames featuring low-involvement products and those featuring high-involvement products. It might be the case for advergames, in particular, that children elaborate the information presented in the advergame more automatically because their cognitive resources are being used up by the primary task (i.e. playing the game) (Buijzen *et al.* 2010) and that, as a result, no distinction is made between low- and high-involvement products.

Another finding of the present study was that persuasion knowledge had no significant effect on brand attitude change: children who demonstrated a high level of persuasion knowledge related to the advergame did not demonstrate lower levels of brand attitude change. This finding is consistent with previous studies (e.g. Mallinckrodt and Mizerski 2007; Van Reijmersdal *et al* 2012) which suggest that children do not automatically draw upon their existing cognitive defence mechanisms when playing advergames. While the children surveyed in our study were found to possess a certain degree of persuasion knowledge after playing the game, they did not appear to have used this knowledge

while playing in order to counteract the effects of the advertising. A surprising effect was found between persuasion knowledge and purchase intention. Children who demonstrated higher levels of persuasion knowledge related to the advergame nevertheless reported higher levels of purchase intention. This finding is remarkable and supports the argument for persuasion knowledge to remain a central subject of research when investigating children's processing of advertising. One plausible explanation for this finding is that children may first have to understand the game's intent before they can consider buying the product. It might also be that attitude change in children works at a more automatic level; in other words, that children do not realise their attitudes are being changed while playing the game. They may well be able to report persuasion knowledge when they are explicitly asked about it in a survey, however. Future research should investigate why persuasion knowledge affects only purchase intent, and not brand attitude. Finally, we found that game attitude did have a significant effect on brand attitude. This finding confirms children's susceptibility to affect transfer: the positive feelings they have towards the game is carried over to the brand itself. In addition, children who had a more positive attitude towards the game also indicated higher purchase intentions. This indicates that having good feelings towards the game influences behavioural intentions and again supports affect transfer theory.

Limitations and directions for future research

Despite conscientious preparation, this study is subject to several important limitations. First, our pre-measurements led us to select coffee as the low-involvement product used in the study, but coffee might not be a product that one would naturally associate with children. We do believe that children encounter coffee in their living environments, however. Recent research by Branum *et al.* (2014) reveals that approximately 73% of children aged 6-11 years consume caffeine on a daily basis and that coffee accounted for almost 24% of this daily intake of caffeine in 2009-2010. This finding suggests that more children are drinking coffee than is generally assumed. Second, our study was limited to children aged 10–12 years. As observed by Waiguny and Terlutter (2011), younger children are more easily influenced by advergames than older children are. Future experiments could compensate for this limitation by including youn ger and/or older participants in the sample. Third, our pre-measurements focused solely on prior brand attitude and not purchase intention, which made it impossible to calculate changes in purchase intention. We chose not to include a pre-measurement variable for purchase intention in Phase 1 because of concerns about revealing the true nature of the experiment. Nevertheless, this does complicate the interpretation of the results for purchase intention. Future research could consider using a pre-measurement of purchase intention, taking into account the abovementioned problem of revealing the experiments' true goal. Finally, when selecting a behavioural reaction to focus on during the study, we opted to measure purchase intention. Children's intention to pester their parents to buy a brand (i.e. 'pester power'; see Waiguny and Terlutter 2011) is

another interesting measurement that could be used in future studies on product involvement and prior brand attitude.

This study provides insight into differences in the affective and behavioural responses of children after playing an advergame depending on product involvement, prior brand attitude and persuasion knowledge. Further work on children and advergaming should explore purchase intention change and brand attitude change in greater depth. It would be interesting to investigate whether repeated exposure (e.g. playing the game multiple times instead of only once) would influence the affective or behavioural responses of children. What is more, in investigating prior brand attitude, this study distinguished between neutral and positive brand attitude. Future research could also include negative brand attitude to explore how this influences brand attitude change and purchase intention. Another interesting line of investigation relates to the long-term effects of playing advergames. Further studies in this area could provide a more detailed picture of how children are influenced by advergames. In the current study, both the lack of significant findings for product involvement and the significant effect of game attitude indicate that advergames are elaborated at an automatic cognitive elaboration level in children. It is therefore unlikely that attitude change among children is based on careful consideration of the product; this may also indicate that attitude change is less enduring (Petty et al. 1983). Investigating long-term effects might provide additional insights into whether low elaboration of the advergame's message leads to less enduring attitude change. Finally, brand familiarity was not investigated in this study (see Mau *et al*. 2009), since we were primarily interested in brand attitude changes. Future studies of advergames and children could consider taking brand familiarity into account.

Implications

The results of our study have both practical and ethical implications. From a marketing perspective, it appears that advergaming does not guarantee a positive attitude change for children and certain brands will benefit more from advertising through advergaming than will others. For instance, a brand which has already established a positive brand attitude among the target audience could use advergaming to further enhance brand loyalty. The results of our study lend no support to the assumption that product involvement has an effect on advertising effectiveness. This means that both low- and high-involvement products can benefit from advertising aimed at children through advergames. It should be noted, however, that the effect of prior brand attitude on purchase intention was higher for high-involvement products. In addition to the type of product being advertised, it is important to consider the content of the game. To achieve a positive brand attitude change, marketeers should use (and possibly pre-test) advergames that are able to succeed in transferring good feelings about the game to the brands themselves.

From an ethical perspective, this study confirms concerns expressed in previous studies (e.g. Panic Cauberghe and De Pelsmacker 2013; Van Reijmersdal *et al.* 2012). It appears, for example, that persuasion knowledge offers children only limited protection against the attitudinal advertising effects of advergaming. Even when children are aware that an advergame is trying to change their attitude, this awareness may not counteract their attitude change. Similarly, and surprisingly, it appears that persuasion knowledge is in fact positively related to purchase intention. This does not mean that less effort should be put into teaching children about advertising intent: advertising remains 'unfair' whenever the target group is unaware of its persuasive intent (Nairn and Hang, 2012). In addition to devoting attention to increasing children's persuasion knowledge with regard to advergaming, it is also important to teach children how to use this knowledge in real-life situations. More specifically, children should be taught that advergames are trying to change their attitude, but also helped to activate and use this knowledge during advertising exposure. Both policymakers and researchers should therefore continue to develop, test and improve teaching materials on online advertising, including advergames, for children.

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Table 1: Pretest product involvement

	N	Mean	SD
Coffee	49	2.04	1.37
Soup	49	2.34	1.25
Mayonnaise	49	2.90	1.77
Soap	50	2.94	.87
Chocolate	49	3.46	1.74
Breakfast cereal	49	3.64	1.53
Chips	50	3.98	1.83
Soda	49	4.03	1.55
Chocolate	50	4.15	1.44
Shower gel	49	4.378	1.49
Camera	49	4.60	1.27
Toothpaste	49	4.71	1.39
Car	49	4.99	1.15
Television	49	5.47	1.36
Computer	49	5.80	1.07
Mobile phone	49	5.99	0.98

Table 2: Brand attitude overview

	N	Mean	SD
Néscafe	41	4.32	1.74
Douwe Egberts	46	4.44	1.86
Illy	16	4.50	1.79
Gini	40	4.66	1.90
Unox	8	4.68	1.48
Pepsi	45	4.69	1.90
Bio	34	4.82	1.69
Sony Ericsson	25	4.97	1.80
Pacard Bell	13	5.08	1.51
Coca Cola	48	5.17	1.08
Knorr	48	5.21	1.50
Everyday	40	5.23	1.47
Ice tea	48	5.24	1.65
Oxfam	29	5.38	1.46
Acer	40	5.46	1.32
Campbell	15	5.47	1.10
Nokia	45	5.55	1.11
HP	33	5.64	1.34
Dell	30	5.66	1.20
Milka	48	5.96	1.29
Cote d'or	47	6.07	1.19
Samsung	46	6.14	.85
Apple	48	6.42	.87

Table 3

Descriptive statistics (*n=216)*

Product involvement	Attitude towards the brand	Mean	SD
Low	Neutral	.37	1.14
	Positive	.70	1.15
	Total	.50	1.15
High	Neutral	.24	.94
	Positive	.96	.85
	Total	.64	.96
Total	Neutral	.30	1.04
	Positive	.86	.98
	Total	.58	1.06

Table 4. Summary of Hierarchical Regression for Variables Predicting Attitude Change

	R^2	R^2 *Change*	*B*	*SE*	β	*t*
Step 1	.07					
Product involvement (ref= low)			.28	.14	.03	.44
Prior brand attitude (ref= neutral)			.54*	.14	.26	3.88
Step 2	.10	.03				
Product involvement (ref= low)			.02	.14	.01	.17
Prior brand attitude (ref= neutral)			.52*	.14	.25	3.78
Game attitude			.13*	.05	.18	2.68
Persuasion knowledge			.02	.02	.02	.26
Step 3	.12	.02				
Product involvement (ref= low)			-.16	.19	-.08	-.82
Prior brand attitude (ref= neutral)			.31	.21	.15	1.50
Game attitude			.19**	.07	.26	2.75
Persuasion knowledge			.02	.08	.01	.22
Game attitude * prior brand attitude			-.12	.09	-.12	-1.28
Persuasion knowledge * game attitude			-.01	.05	-.02	-.25
Prior brand attitude * product involvement			.40	.28	.17	1.41

*Note. Statistical significance: * p<.05; ** p<0.01; *** p<0.001*

Table 5. Summary of Hierarchical Regression for Variables Predicting Purchase Intention

	R^2	R^2 *Change*	*B*	*SE*	*β*	*t*
Step 1	.25					
Product involvement (ref= low)			1.05***	.19	.30	5.63
Prior brand attitude (ref= neutral)			1.37***	.19	.40	7.34
Step 2	.33	.08				
Product involvement (ref= low)			.86***	.18	.25	4.80
Prior brand attitude (ref= neutral)			1.46***	.18	.42	8.20
Game attitude			.24***	.06	.22	4.15
Persuasion knowledge			.32**	.10	.17	3.20
Step 3	.33	.00				
Product involvement (ref= low)			.09	.24	.03	.36
Prior brand attitude (ref= neutral)			.65**	.25	.18	2.60
Game attitude			.18*	.08	.16	2.83
Persuasion knowledge			.26	.10	.14	2.66
Game attitude * prior brand attitude			.09	.11	.06	.79
Persuasion knowledge * game attitude			-.02	.06	-.02	-.37
Prior brand attitude * product involvement			1.56	.35	.40	4.48

*Note. Statistical significance: * p<.05; ** p<0.01; *** p<0.001*