There is a vital need for an updated evaluation of children’s and adolescents’ changing commercial media environment. In this article, we introduce an investigative framework for young people’s processing of commercial media content (PCMC) that can deal with current and future developments in the media landscape. To develop this framework, we (a) introduce an integrated model of young people’s persuasion processing, adopting a developmental perspective on adult persuasion models; (b) theorize how communication can predict persuasion processing, based on a limited capacity information processing approach; (c) identify specific message characteristics that affect persuasion processing (e.g., prominence, interactivity, integration). Thus, the PCMC model provides a theoretical framework as well as specific guidelines for future research investigating young people’s commercialized media environment.

doi:10.1111/j.1468-2885.2010.01370.x

In the new millennium dramatic changes have taken place in children’s and adolescents’ commercial media environment. Advertisers targeting the youth market have rapidly adopted new media technologies including branded Websites, brand placement in popular computer games, and social media such as Facebook and Twitter (Calvert, 2008; Moore, 2004; Schor, 2005). These new practices are fundamentally different from traditional advertising. Studies investigating nontraditional forms of advertising have observed that those new practices are frequently embedded within program or editorial content, resulting in blurring boundaries between advertising, entertainment, and information (Calvert, 2008; Wright, Friestad, & Boush, 2005).

The level of integration between the persuasive message and its context is arguably one of the defining characteristics of the current commercialized media environment. Three types of integration between a persuasive message and its context can be distinguished: format, thematic, and narrative integration. Format integration refers to the level of integration between the message format and the editorial context...
A Processing Model for Commercial Media Content

M. Buijzen et al.

Examples include advertorials in magazines or Websites that are designed to resemble editorial articles or Website content. Thematic integration refers to the conceptual fit or congruence between the persuasive message and its context (Gunter, Baluch, Duffy, & Furnham, 2000; Moorman, Neijens, & Smit, 2002). This may include, for example, placement of ads around thematically congruent content, such as placement of the Nike brand logo in a football or soccer game, or an advertisement for Bratz action figures in the Bratz magazine.

Finally, narrative integration refers to the semantic or conceptual relevance of the persuasive message within the narrative of the surrounding media context (Russell, 2002; Yang & Roskos-Ewoldsen, 2007). Television programs based on brands provide a typical example. Children’s programs such as Hannah Montana, Bratz, and Dora the Explorer can each be seen as program-length commercials for the corresponding action figures and other brand extensions, including toys, magazines, and music. An advergame is another example of narrative integration. Advergames are advertiser-sponsored online games in which the product or brand logo is an essential game component, for example, by serving as rewards or goals.

There is a vital need for an updated evaluation of the commercialized media environment, as its highly integrated nature may pose new challenges for young people’s processing of advertising. For example, when a commercial message is embedded within an advergame or program-length commercial, children may be less ready to critically process the message (Owen, Lewis, Auty, & Buijzen, 2009). However, the dynamic, integrated, and highly complex nature of the current media environment is problematic to investigate. Given the rapid and ongoing technological changes, research focusing on individual practices (such as advergames or branded Websites) rapidly becomes obsolete due to new and fast-emerging advertising practices and is thus no longer adequate. To deal with current and future developments in the media environment, there is a need for a higher-level theoretical approach.

Unfortunately, existing child and advertising literature is unable to provide sufficient theoretical foundations for such an approach. Academic research has failed to keep pace with recent changes in young people’s media environment. The vast majority of research has focused on traditional television advertising (i.e., discrete advertisements of standard lengths that appear at predictable intervals in program breaks). Until recently, this focus of interest was justifiable, given that most child-directed advertising expenditure focused on television advertising, and television viewing was children’s predominant leisure time activity (Beentjes, Koolstra, Marseille, & Van der Voort, 2001; Rideout, Roberts, & Foehr, 2005). However, this focus is no longer sufficient for the current media environment.

In addition, the research literature on child-directed advertising has focused largely on the development of children’s advertising literacy (i.e., their ability to recognize and understand the nature and intent of advertising) and on the consequences of advertising exposure (e.g., purchase request behavior, materialistic orientations, and increased risk of being overweight; for reviews, see Buijzen &
Only sporadic attention has been devoted to the underlying mechanisms of the persuasion process (cf. Buijzen & Valkenburg, 2003; Moore & Rideout, 2007). Acquiring detailed insight into children’s processing of persuasive messages is vital, as it can help us to understand and predict the outcomes of children’s advertising exposure—including its undesired outcomes—and thus provide a basis for marketing-related policies and intervention strategies (Austin & Johnson, 1997; Buijzen, 2007). In order to adopt a theoretical approach to children’s and adolescents’ processing of advertising, we need to draw upon the rich theoretical and empirical work regarding adult persuasion processes.

In this article we introduce the PCMC model, an investigative framework for young people’s processing of commercial media content (PCMC). Three steps are undertaken to construct this framework. First, we introduce a model of children’s persuasion processing that is grounded in adult persuasion processing theory. To do so, we integrate adult models of persuasion (e.g., Meyers-Levy & Malaviya, 1999; Petty, Cacioppo, Strathmann, & Priester, 2005) with theories of children’s consumer development and socialization (e.g., John, 1999; Moschis, 1987; Valkenburg & Cantor, 2001). Second, we theorize as to how a persuasive message may impact upon the type of processing, by utilizing a limited capacity information processing approach (e.g., Gao & Lang, 2009; Lang, 2000; Lang, Bradley, Park, Shin, & Chung, 2006).

In a third and final step, we use our integrated model to identify several specific characteristics of commercial media content that may affect children’s processing of persuasive messages. In order to deal with the continuously evolving media landscape, our approach goes beyond the characteristics of individual advertising practices and focuses instead on more general, universally applicable characteristics of the message and its context (e.g., prominence, interactivity, and integration), each of which are likely to account for young people’s processing of the messages. The PCMC model thus provides specific guidelines regarding future research investigating children’s and adolescents’ commercialized media environment.

A triple-level model of young people’s processing of persuasive messages

The adult literature encompasses numerous models of persuasion, although most authors agree that persuasion can occur through several processes. The two most widely adopted multiple-process models are the elaboration likelihood model (Petty & Cacioppo, 1996; Petty et al., 2005) and the heuristic systematic model (Chaiken & Trope, 1999; Eagly & Chaiken, 1993). Although these models differ in several respects, they share the fundamental assumption that under some conditions, people process a persuasive message systematically and carefully (referred to as the systematic or central process) and at other times, they rely on simple cues or shortcuts, using low-effort mechanisms to respond to a message (the heuristic or peripheral process). Over the past decade there has been increasing attention toward a third even less elaborate process, characterized by a primacy of automatic and unconscious reactions: the
automatic or experiential process (Chartrand, 2005; Epstein & Pacini, 1999; Heath, 2000, 2001; Meyers-Levy & Malaviya, 1999). We therefore focus on three types of processing, which will be henceforth referred to as systematic, heuristic, and automatic persuasion processes.

Three levels of persuasion processing

The three persuasion processes are characterized by varying levels of cognitive elaboration in response to a message—that is, the recipients’ level of processing of the available information in the immediate persuasion context (Petty & Cacioppo, 1996). Cognitive elaboration, in turn, relates to the recipients’ level of attention to and awareness of the message (Chartrand, 2005; Heath, 2000, 2001) and to their motivation and ability to process the message effortfully (Eagly & Chaiken, 1993; Kardes, 2005; Petty et al., 2005). In addition, each of the three persuasion processes comprises different mechanisms that lead to attitudinal and behavioral changes regarding the advertised product or brand. Thus, although each process may lead to attitudinal and behavioral change, the specific mediating mechanisms via which this may occur differ in accordance with the processing route taken. Those mechanisms may involve, for instance, implicit or explicit recall of the advertised brand. In sum, each persuasion process can be characterized both quantitatively (in terms of message elaboration) and qualitatively (in terms of the mechanisms leading to attitude change).

Systematic persuasion processing is based on relatively extensive, deliberate, and effortful cognitive elaboration (Petty et al., 2005). For systematic processing to occur, the recipient must show high attention to and awareness of the message, and be highly motivated and able to process all available information (Heath, 2000; Petty & Cacioppo, 1996; Petty et al., 2005). Although it is not specified in the existing literature, we distinguish between two levels of systematic processing. At the most elaborate level, critical systematic processing involves an awareness of the persuasive nature of the message, with the recipient actively applying the relevant persuasion knowledge or advertising literacy (Boush, Friestad, & Rose, 1994). At a less elaborate level, noncritical systematic processing involves a high awareness of the message or brand, without awareness of its persuasive intent.

In the systematic process, persuasion mechanisms leading to attitude change involve active learning mechanisms and formulation of cognitive responses, such as pro- and counterargumentation to message claims and deliberation over the message source (Heath, 2009; Petty & Cacioppo, 1996; Petty et al., 2005; Van Raaij, 1986). Systematic processing will be characterized by high levels of explicit recall of the persuasive message and the advertised product or brand. The degree and valence of the attitude change may depend on, for example, the strength of the persuasive arguments or the credibility of the message source (Petty et al., 2005; Van Raaij, 1986).

Heuristic persuasion processing is characterized by a moderate level of cognitive elaboration. Compared with the systematic process, the recipient uses merely moderate to low levels of message attention and awareness, and a low motivation and
ability to process the message. Within the heuristic process, the recipient looks for an easy way to form an overall evaluation of the product or brand and thus relies on relatively simple and low-effort decision strategies. Therefore, consumer defenses such as insight into the persuasive nature and intent of advertising are less likely to affect this type of processing, when compared with systematic processing (Livingstone & Helsper, 2006).

The mechanisms leading to attitude change involve relatively passive learning and information retrieval mechanisms, such as social learning and consumer cultivation (Atkin, 1976; Heath, 2009; Moschis, 1985; Shrum, Burroughs, & Rindfleisch, 2005; Shrum, Wyer, & O’Guinn, 1998). The outcome of the heuristic process may depend on simple heuristic cues, such as number of persuasive arguments, source attractiveness, and product symbolism. It has been argued that current marketing practices, particularly those aimed at children, rely heavily on this type of processing, due to their increased focus on emotion- and entertainment-based strategies rather than information and rational argumentation (Heath, 2009; Livingstone & Helsper, 2006; Nairn & Fine, 2008).

Finally, automatic persuasion processing is characterized by a minimal level of cognitive elaboration (Chartrand, 2005; Heath, 2000; Meyers-Levy & Malaviya, 1999). In the automatic process, advertising exposure may lead to attitude change without explicit attention to or awareness of the persuasive communication (Auty & Lewis, 2004; Grimes & Kitchen, 2007; Heath, 2000; Meyers-Levy & Malaviya, 1999). Likewise, recipient motivation and ability to process are not required (Barth, 1992; Heath, 2000; Moors & De Houwer, 2006). Explicit recall of the persuasive message and the advertised product or brand will be low, yet implicit brand memory can be detected, for example, through implicit recognition tasks (Owen, Lewis, Auty, & Buijzen, 2010; Yang & Roskos-Ewoldsen, 2007). Further, consumer defenses such as persuasion knowledge and skepticism are unlikely to be activated because recipients are often unaware that they are being targeted. Highly embedded and hidden forms of marketing rely on this type of processing, including subtle brand placements in movies, games, and Websites.

In the automatic persuasion process, attitude change occurs through implicit and affect-based learning mechanisms, such as evaluative conditioning, affect transfer, and preconscious emotional associations (Chartrand, 2005; De Houwer, Thomas, & Baeyens, 2001; Dijksterhuis, Smith, Van Baaren, & Wigboldus, 2005). Exposure to a brand logo or name leads to more fluent processing when the brand is encountered again. This facilitated processing fluency leads to a sense of familiarity that may, in turn, be misconstrued as a beneficial quality, resulting in positive affect toward the brand (Jacoby, Kelley, & Dywan, 1989; Janiszewski, 1993). The strength and direction of attitude change within the automatic process may be determined by exposure duration and the valence of the message (Butler, 2004; Calvert, 2008; Michel & Roebers, 2008; Van Reijmersdal, Neijens, & Smit, 2007). For example, the positive affect associated with entertaining advergames becomes transferred to the brand outside conscious awareness.
A Processing Model for Commercial Media Content
M. Buijzen et al.

Systematic, heuristic, and automatic persuasion processing may each lead to attitude formation or change, which may in turn affect consumer behavior. However, the strength and endurance of the attitude formation may differ according to the processing route taken. Recent literature on attitude formation suggests that different levels of processing may result in different types of attitudes, which in turn affect different types of consumer decisions. Specifically, lower levels of processing are more likely to result in implicit attitude formation, which plays a more important role in spontaneous and impulsive consumer behavior. Systematically formed attitudes are likely to be more explicit and predict more conscious and deliberate consumer decisions (Petty, Fazio, & Briñol, 2009).

The triple-level model from a developmental perspective
The triple-process model of persuasion may be a valuable tool in predicting young people’s processing of persuasive messages. However, as children and adolescents are in the midst of cognitive, social, and personality development, adult persuasion models cannot be applied directly (John, 1999; Te’eni-Harari, Lampert, & Lehman-Wilzig, 2007; Valkenburg & Cantor, 2001). Importantly, children’s relatively immature advertising and consumer skills (e.g., advertising literacy, marketplace experience, brand memory, and consumption autonomy) are likely to affect their processing of persuasive messages. For example, when children are not yet able to recognize the commercial nature and persuasive intent of a persuasive message, they will be less likely to process this message systematically and carefully. In addition, rational systematic processing requires domain-specific knowledge that children often still lack (Valkenburg, 2004).

The most important changes in advertising and consumer skills take place between infancy and early adolescence. Based on theories of consumer development (John, 1999; Valkenburg & Cantor, 2001) and more general frameworks of children’s cognitive (Piaget, 1929), social (Selman, 1980), and personality development (Shaffer & Kipp, 2007), four phases in the development of children’s persuasion processing can be distinguished: early childhood (younger than 5 years old), middle childhood (6–9 years), late childhood (10–12 years), and adolescence (13 years and older). Within each phase, children accumulate consumer- and advertising-related skills and experience. It is generally assumed that by the age of 16, these skills have reached adult-like levels (John, 1999; Valkenburg, 2004).

In early childhood, children view advertising primarily as entertainment and are generally unaware of its persuasive intent (Barling & Fullagar, 1983; Valkenburg, 2004). They have a limited ability to take a perspective other than their own, which inhibits their understanding of advertisers’ intentions (John, 1999; Moses & Baldwin, 2005). In addition, these young children lack the necessary information-processing abilities (i.e., explicit memory storage and retrieval) and market-related experience to process a persuasive message elaborately (John, 1999; Roedder, 1981; Siegler, 1998). This renders systematic processing—and even heuristic processing—less likely. Children in early childhood are therefore more likely to be influenced via the
automatic process. Positive feelings evoked during exposure to attractive animated characters, bright colors, and lively music transfer to the advertised products and can help shape young children’s brand attitudes without their knowledge (MacKenzie, Lutz, & Belch, 1986; Moore & Rideout, 2007).

As children enter middle childhood, important changes take place in consumer development. Children become increasingly capable of perspective taking and contingent thought and develop a basic understanding of advertising’s selling intent. In addition, they become able to evaluate products and brands on more than one dimension (Valkenburg, 2004; Valkenburg & Cantor, 2001). These increased abilities may result in more elaborate processing of persuasive communication. However, more elaborate processing does not necessarily involve critical systematic processing in terms of counterargumentation and source derogation (Brucks, Armstrong, & Goldberg, 1988; Buijzen, 2007; John, 1999). Further, as their information-processing skills are not yet fully developed, children in middle childhood are unlikely to spontaneously apply their persuasion knowledge as a defense during exposure to persuasive messages (Buijzen, 2007; John, 1999; Lapierre, Rozendaal, Buijzen, & Van Reijmersdal, 2010). Finally, children in this phase have been shown to be easily swayed by simple heuristic cues, such as favorite television characters, premiums, and physical aspects of product packaging (Atkin, 1980; Calvert, 2008; Shimp, Dyer, & Divita, 1976).

During late childhood, children’s cognitive and social abilities continue to evolve. Children become capable of abstract thought and reasoning and are able to see things within a broader perspective (Valkenburg, 2004). They acquire the abilities and experience to process persuasive communication on a more elaborate level. They are able to evaluate advertising systematically and critically and to come to consumer decisions by carefully evaluating different aspects of advertised products and brands (Valkenburg & Cantor, 2000). In addition, on account of a growing financial independence and autonomy in making those consumer decisions, they are also more motivated to process messages elaborately. However, while they possess the abilities and motivations required for systematic processing, children in this age group still require prompts or cues to activate critical systematic processing (John, 1999). Further, as peer influence becomes more important, in late childhood children become increasingly sensitive to heuristic cues, such as peer popularity and status appeal (Achenreiner & John, 2003; Livingstone & Helsper, 2006).

Finally, in adolescence, children’s cognitive processing capacities reach adult-like levels and they become capable of processing persuasive messages at the most elaborate level (John, 1999; Pechmann, Levine, Loughlin, & Leslie, 2005). Additionally, due to the development of hypothetical-deductive reasoning skills they become more critical and skeptical toward the surrounding world, including the commercial environment, and become capable of critical systematic processing (Boush et al., 1994; Shaffer & Kipp, 2007; Steinberg, 2004). However, despite these more mature cognitive skills, they are still in the midst of identity development, which may have important implications for the processing of commercial messages. In the early stages of identity
development, self-presentation and conformity to the peer group or subculture are extremely important. In combination with a high degree of self-consciousness and social anxiety, this may result in a greater susceptibility to consumer symbolism, such as brand-related social status, image, and physical attractiveness (Pechmann et al., 2005).

In sum, it can be argued that young consumers are particularly sensitive to less elaborate processing mechanisms. Developmental changes characterizing childhood are likely to inhibit the motivation and ability to process persuasive messages systematically and critically. Additionally, these developmental changes are likely to affect how children respond to specific message characteristics. It is therefore important to take children’s developmental level into consideration when predicting how message characteristics affect the persuasion process.

**Predicting young people’s processing of persuasive messages**

The next step in developing our PCMC model is to theorize as to how persuasive messages can render one of the processing routes more likely. It is important to note that it is not our intention to adopt a hypodermic needle approach, assuming that the message independently predicts the persuasion process. The processing route taken may also depend on the recipient (e.g., phase of development) and the processing situation (e.g., time limitations, distractions). However, because we aim to provide a framework to investigate the commercialized media environment, we attempt to predict how commercial content may increase the likelihood of a particular processing route being taken. In view of the increasing integration between persuasive and editorial content, we focus on the role of the persuasive message itself (i.e., media content designed and intended by an advertiser to increase brand awareness, preference, or purchase intent, such as a television commercial, print advertisement, or brand placement; Moore, 2006) as well as the immediate context (i.e., the environment of the advertisement provided by the vehicle carrying it, such as a television program, magazine issue, or video game; Moorman, 2003).

Based on more general information processing theories, most persuasion models assume that the particular processing route recipients adopt depends on the amount of cognitive resources that they are willing and able to devote to message processing. This mechanism is most commonly referred to as resource allocation (Lang, 2000; Meyers-Levy & Malaviya, 1999). Most theories also agree that resources are limited and recipients must be parsimonious in allocating them (Lang, 2000; Petty et al., 2005). Allocation occurs through an unconscious selection process, termed preattentive processing (Heath, 2001; Lang, 2000). People constantly scan their surroundings, unconsciously and automatically, in order to determine whether something deserves more focused attention. The only mental action is to determine the relevance of what is perceived and to select information to be encoded further. Selection mechanisms steering the choice of information to be encoded include the orienting response (Lang, 2000) and the primary affective reaction (Van Raaij, 1986). Within these
mechanisms, the message is evaluated and an automatic or controlled decision is made to allocate cognitive resources to message processing.

Despite the consensus on the importance of resource allocation, the literature is not entirely clear regarding how resource allocation relates to the level of processing. Meyers-Levy and Malaviya (1999) have argued that high resource allocation leads to systematic processing, moderate resource allocation to heuristic processing, and low resource allocation to automatic processing. However, in our view, allocation and elaboration are not necessarily linked. It is conceivable that resources are allocated, for example, in response to an attention-grabbing stimulus, but that the information is not processed further because attention is not maintained. Thus, message processing can be considered as a two-step process, in which recipients consciously or unconsciously decide (a) where to allocate their resources (i.e., resource allocation), and (b) when to use those resources further in message processing (i.e., cognitive elaboration). To predict how a persuasive message can affect the level of processing, it is necessary to understand how the message impacts upon this two-step process.

The resources allocated and resources required ratio

The limited capacity model of mediated message processing (LCMP), introduced by Lang and colleagues, may help explain the link between the message, resource allocation, and cognitive elaboration (Gao & Lang, 2009; Lang, 2000; Lang et al., 2006). The LCMP assumes that a recipient’s level of processing elaboration depends not only on resources allocated (RA) but also on the resources required (RR) by the message, for example, as a result of its complexity (Fisch, 2000; Gao & Lang, 2009; Lang, 2000). Recipients allocate a certain amount of resources to the message, but use only the resources that are required to process it. Allocated resources that are used determine message elaboration or, in terms of the LCMP, the encoding performance. Resources allocated but not used remain available for secondary tasks (Lang et al., 2006).

The limited capacity approach enables us to make predictions as to how a message may affect persuasion processing and applies not only to the persuasive message itself but also to its direct context. On the one hand, the persuasive message can be considered as the primary task. A persuasive message can affect the amount of RA, yet the RR by that message determine the level of cognitive elaboration (i.e., level of processing). In other words, the RR by the message determine elaboration, provided that sufficient resources are allocated. On the other hand, the context could also be considered as the primary task. In the commercial media environment, the recipient’s primary goal is generally to watch a program, use a Website, or play a video game (Fisch, 2000), and processing the persuasive message is merely a secondary task (Nebenzahl & Jaffe, 1998). The resources left available when watching a program or playing a game may be used to allocate to the advertisement or brand placement. In turn, the RR by the persuasive message are likely to then determine the level of elaboration of the persuasive message.
Even though limited resource capacity has been acknowledged in the persuasion literature, the limited capacity model of mediated message processing has not been systematically applied to multilevel processing models. We can connect the LCMP to our triple-level process model by having a closer look at the possible ratios between RA and RR by the persuasive message and its context (RA/RR ratio). To do so, we have mapped out four possible RA/RR ratios, each resulting in a different level of processing in the triple-process model. Table 1 presents these processing situations following exposure to a persuasive message, and Table 2 depicts them in terms of the context of the persuasive message. Thus, the framework can be applied to integrated commercial media content.

Four RA/RR ratios applied to the persuasive message

In the first processing situation in Table 1, when resources allocated to persuasive message (RAPM) and resources required by the persuasive message (RRPM) are both relatively low, message elaboration will also be low, resulting in automatic processing or no processing at all. Examples of this processing situation can be found in the brand placement literature. A subtle and simple brand placement, for example, a brand logo in the background of a program scene, will not evoke RA (because it does not draw attention) nor RR (because it simply shows a logo), and might therefore lead to less elaborate processing. Several studies have demonstrated that subtle brand placements do not affect explicit recall of the brand, yet do affect implicit measures, such as implicit brand recognition, attitude, and choice (Auty & Lewis, 2004; Law & Braun, 2000; McCarty, 2004; Van Reijmersdal et al., 2007; Yang, Roskos-Ewoldsen, Dinu, & Arpan, 2006). These results indicate an automatic process, in which viewers were influenced by the brand placement without being aware.

Second, when RA are high while RR by the persuasive message are low, this is likely to result in heuristic or noncritical systematic processing. Because only few resources

<table>
<thead>
<tr>
<th>RRPM</th>
<th>RAPM low</th>
<th>RAPM high</th>
</tr>
</thead>
<tbody>
<tr>
<td>RRPM low</td>
<td>1. No or low elaboration; no automatic processing of persuasive message</td>
<td>2. Moderate elaboration; heuristic or noncritical systematic processing of persuasive message</td>
</tr>
<tr>
<td>RRPM high</td>
<td>4. (Imminent) cognitive overload; automatic or heuristic processing of persuasive message</td>
<td>3. High elaboration; critical systematic processing of persuasive message</td>
</tr>
</tbody>
</table>

RAPM, resources allocated to persuasive message; RRPM, resources required by persuasive message.
are required to process the message, not all RA will be used for message elaboration. This situation would occur with a more prominent brand placement, for example, when the product is being used by a movie character. In that case, the placement would lead to higher resource allocation—because a product that is being used by a character is more visually salient and draws more attention—yet still require only few resources. Yang and Roskos-Ewoldsen (2007) compared different levels of placement prominence and found that when the product was used by a program character, it increased viewers’ explicit brand recall and attitudes compared with more subtly placed brands—indicating relatively elaborate, yet noncritical processing.

The third processing situation, in which both RA and RR are relatively high, may result in a higher level of systematic processing of the persuasive message. Again drawing from the brand placement literature, a very prominently placed brand, for example, playing a role in the program’s story line or being an active game component, may evoke both RA and RR. Several studies demonstrated that such prominent placements lead to better awareness and recall of the brand, but not necessarily to more positive brand attitudes (Cowley & Barron, 2008; Matthes, Schemer, & Wirth, 2007; Russell, 2002; Yang & Roskos-Ewoldsen, 2007). These results indicate critical systematic processing of prominent brand placements. In some cases, prominence may even activate cognitive defenses against persuasion, which would explain the negative attitude change observed in some studies (cf. Van Reijmersdal, 2009).

Fourth, when RA are low while RR are high, this is likely to lead to cognitive overload (Gao & Lang, 2009; Lang, 2000). Gao and Lang demonstrated that in case of cognitive overload, for instance, due to high information density, recipients stop allocating resources to the message. In the case of advertising exposure, such overload will most likely lead to no processing or automatic processing of the persuasive message. This concurs with findings on children’s television viewing

<table>
<thead>
<tr>
<th>RRC</th>
<th>RAC low</th>
<th>RAC high</th>
</tr>
</thead>
<tbody>
<tr>
<td>RRC low</td>
<td>1. No or low elaboration of context; low resources available for RAPM, leading to situation 1 or 4 in Table 1</td>
<td>2. Moderate elaboration of context; high available resources for RAPM, leading to situation 2 or 3 in Table 1</td>
</tr>
<tr>
<td>RRC high</td>
<td>3. High elaboration of context; low available resources for RAPM, leading to situation 1 or 4 in Table 1</td>
<td>4. (Imminent) cognitive overload; low available resources for RAPM, leading to situation 1 or 4 in Table 1</td>
</tr>
</tbody>
</table>

RAC, resources allocated to context; RRC, resources required by context; RAPM, resources allocated to persuasive message.
behavior, which indicates that children’s attention drops when a message becomes too complex (Anderson, Pugzles-Lorch, Field, & Sanders, 1981; Michel & Roebers, 2008; Valkenburg & Vroone, 2004). In addition, it is conceivable that in the case of imminent cognitive overload, for example, when a message becomes too complex or offers too much information, recipients attempt to cope with this negative RA/RR ratio by relying on heuristic cues.

**Four RA/RR ratios applied to the message context**

The RA/RR ratio framework may apply not only to characteristics of the persuasive message itself but also to its direct context. As noted above, the LCMP assumes that resources allocated but not used are available for secondary tasks (available resources = RA − RR; Gao & Lang, 2009; Lang et al., 2006). This implies that the amount of resources left available when watching a program or playing a game may be used to allocate to the advertisement or brand placement (i.e., RAPM [Table 1] = RAC − RRC [Table 2]). In turn, the ratio between the RA and RR by the persuasive message will then determine the level of elaboration of the persuasive message and the particular processing route taken. Thus, PCMC can be considered as a cascade process, in which the spillover of RA to the context can be used for processing of the persuasive message.

Table 2 shows the four RA/RR ratios with respect to the context of the persuasive message, each resulting in a certain amount of resources available for processing of the persuasive message. Therefore, each cell in Table 2 links to one or more cells in Table 1. In the first situation in Table 2, where resources allocated to context (RAC) and required by the context (RRC) are both relatively low, the amount of resources available to allocate to the persuasive message is also low, most likely resulting in relatively low-level processing of the persuasive message (situation 1 or 4 in Table 1, depending on the RR by the persuasive message). Low-involvement media, such as television entertainment, have been shown to evoke these lower levels of persuasion processing (Heath, 2000, 2009).

Second, when RA to the context are high while RR are low, this will result in a high amount of resources available for the persuasive message. Depending on the RR by the persuasive message, this is likely to result in heuristic or systematic processing (situation 2 or 3 in Table 1). In research investigating brand placement in video games, gamers who experienced difficulty in playing the game demonstrated lower brand recall compared with more experienced users, which can be explained by a lower amount of available resources to process the brand placement (Green & Bavelier, 2003; Schneider & Cornwell, 2005).

Third, when RA and RR are both relatively high, no resources will be available for the persuasive message, resulting in no or automatic processing (situation 1 or 4 in Table 1). This situation is illustrated by another gaming study, in which brand placement in a highly immersive first-person shooting game hardly affected recall and purchase intent of the advertised brand (Chaney, Lin, & Chaney, 2004). In this example, all resources were allocated to and required by the immersive game, leaving
no resources available for processing of the persuasive message, and resulting in no elaboration at all. In other words, the high-RAC/high-RRC situation resulted in the first processing situation in Table 1, involving no elaboration of the persuasive message.

Fourth, cognitive overload resulting from the context (i.e., RA low, RR high) will result in a low amount of available resources, resulting in lower-level processing of the persuasive message (situation 1 or 4, Table 1). Gao and Lang (2009) found that in case of cognitive overload, the exact amount of RA to the secondary task depended on the amount of RA originally to the primary task. In addition, studies on children’s television viewing behavior have found that when TV programming became too complex, children’s attention was completely drawn away from the television set, which implies that the advertisement or brand placement would be processed at a very low level, if processed at all (Anderson & Burns, 1991; Valkenburg & Vroone, 2004).

Identifying specific message factors determining processing of persuasive messages

We have now integrated theoretical models of adult persuasion, consumer development, and limited capacity processing to predict the level of processing of the persuasive message and its context. Based on this model for PCMC, we can make predictions as to how specific message factors may affect young people’s persuasion processing. A persuasive message and its context can contain certain elements that affect the RA and/or the RR, thus rendering one of the processing routes more likely (Chaney et al., 2004; Eagly & Chaiken, 1993; Kardes, 2005; Petty et al., 2005). For example, Lang and colleagues have established the role of complexity in determining the ratio between RA and RR. From the marketing and communication literatures several additional factors can be identified. We conclude this article with an overview of specific message factors that may affect the RA/RR ratio and thus predict the level of persuasion processing. We also discuss how these factors interact with development.

Affecting RA: Personal relevance and perceptual prominence

Resource allocation can be determined by the personal relevance and perceptual prominence of a message. Relevance refers to the personal importance of the message for the recipient, pertaining to the characters and the advertised brand (Gorn & Florsheim, 1985; Petty & Priester, 1994; Wartella, 1980). For example, age-appropriate characters and product categories will increase children’s attention to and involvement with the message. Perceptual prominence concerns the salience of sensory information in the message, mainly in the form of attention-grabbing visual and auditory format features, characterized by change, novelty, movement, or intensity (Anderson & Burns, 1991; Anderson & Pugzles-Lorch, 1983; Anderson, Pugzles-Lorch, Field, Collins, & Nathan, 1986; Lang, Geiger, Strickwerda, & Sumner, 1993; Reeves et al., 1985). Perceptually salient message characteristics have been shown to attract attention and are therefore likely to increase resource allocation (Barr, 2008; Huston et al., 1981; Lang, 2000).
Relevant and prominent message elements function as signal stimuli, which trigger the orienting response, and consequently lead to resource allocation (Lang, 2000; Valkenburg & Vroone, 2004). High relevance and prominence of the persuasive message will therefore increase the chance of situation 2 or 3 occurring, which involve heuristic or systematic processing (Table 1). High relevance and prominence of the context will result in an amount of available resources that is either relatively high (when RR by the context are low; situation 2 in Table 2) or relatively low (when RR by the context are high; situation 3 in Table 2). The specific level of processing will depend on the RR by the persuasive message. Relevance and prominence are therefore likely to interact with factors that affect RR (e.g., complexity, interactivity) in predicting the level of processing.

**Affecting RR: Complexity and interactivity**
The RR to process a message may be determined by its complexity and interactivity (Calvert, Strong, & Gallagher, 2005; Fisch, 2000; Glass, 2007; Lang, 2000; Liu & Shrum, 2009; Nelson, 2002; Nelson, Yaros, & Keum, 2006). Complexity concerns the type, amount, speed, and intricacy of information presented. The higher the message complexity, the more cognitive resources are required to process it (Fisch, 2000; Gao & Lang, 2009; Lang, 2000). The same is true for interactivity, which refers to the degree of active interaction or engagement required in the persuasive communication. The more interactive a message, the more cognitive resources are required to process it, especially for inexperienced users (Liu & Shrum, 2009).

High message complexity and interactivity are therefore likely to lead to situations 3 or 4 in Table 1, involving systematic processing or cognitive overload. When a message is too complex—for example, when it contains foreign language, nonchronological scene order, or too many cuts and changes—this may lead to cognitive overload (situation 4 in Table 1), and the recipient’s attention will decrease (Anderson et al., 1981; Gao & Lang, 2009; Liu & Shrum, 2009; Michel & Roebers, 2008; Valkenburg & Vroone, 2004). The point at which overload occurs will depend on the amount of RA initially and may therefore depend on the presence of message factors determining resource allocation. Likewise, when applied to the context, the amount of available resources for processing of the persuasive message will depend on the amount of RA to the context initially (Table 2).

**Affecting both RA and RR: Content style**
Content style of the persuasive message refers to the strategies or appeals used to deliver the message, including information based, entertainment based, and emotive styles. These content styles are likely to affect both RA and RR (Gao & Lang, 2009). Information-based content may lead to higher amounts of RA and RR, resulting in more systematic processing (situation 3 in Table 1). Entertainment-based content leads to high resource allocation, but does not require many processing resources, and is therefore likely to result in heuristic processing (situation 2 in Table 1). Persuasion research among adults confirms that information-based advertising leads to more
elaborate processing, while entertainment-based advertising leads to moderate or low processing of the persuasive message (Heath, 2000; McCarty, 2004; Meyers-Levy & Malaviya, 1999; Obermiller, Spangenberg, & MacLachlan, 2005).

In addition, a highly emotive or arousing content style (e.g., involving sex, violence, or accidents) has been shown to increase both RA and RR and will lead to more elaborate processing (Gao & Lang, 2009). When applied to the persuasive message, this means that emotive content increases the likelihood of situation 3 occurring, involving systematic processing (Table 1). However, when applied to the context, highly emotive programming will leave few resources available for processing of the persuasive message. Several studies confirm that an arousing program context, such as the Super Bowl broadcast, leads to lower-level processing of the persuasive messages embedded (Matthes et al., 2007; Pavelchak, Antil, & Munch, 1988).

**Integration of the persuasive message and its context**

Finally, the type and level of integration between the persuasive message and its context (i.e., format, thematic, and narrative integration) is likely to have important consequences for the persuasion process. In a model predicting children’s processing of educational television content, Fisch (2000) argued that when the integration between the narrative context and the educational content is high, processing of the two types of content becomes complementary rather than competitive. That is, the RA to the narrative are more likely to be used for processing of the educational content. In terms of our model, when a persuasive message and its context are highly integrated, the RA/RR ratio of the context may directly apply to the level of processing of the persuasive message.

In other words, the RA/RR ratio of the persuasive message is likely to relate directly to the prominence, relevance, complexity, interactivity, and content style of the context. For instance, an advertorial in a magazine, which is designed to look like editorial magazine content (i.e., high format integration), will lead to the same level of elaboration as its context (Van Reijmersdal, Neijens, & Smit, 2005). Likewise, in-game brand placement that served as an essential part of an interactive game, for example, by serving as rewards or goals (i.e., high narrative integration), has been shown to increase explicit memory of the brand (Schneider & Cornwell, 2005; Yang & Wang, 2008). In these cases, the interactivity of the game directly resulted in systematic processing of the brand placement.

Crucially, integration also links to conscious awareness of the message and its persuasive intent (Friestad & Wright, 1994). When the persuasive message is highly integrated in the editorial context, its persuasive nature will be recognized less easily, which in turn is unlikely to lead to critical systematic processing. However, this is only true for format and thematic integration. For narrative integration an opposite pattern will occur, because a brand that plays an important part in the storyline is more prominent and is therefore more likely to activate awareness of the persuasive intent of the placement (Van Reijmersdal, 2009). A high integration of the advertised brand in the story plot has therefore been shown to lead to better recall, and also
to more negative attitudes toward the brand, which indicates critical systematic processing (Yang & Roskos-Ewoldsen, 2007).

RA and RR from a developmental perspective
It is also important to discuss how cognitive, social, and personality development may affect recipient responses to specific message characteristics. First, developmental factors may affect RA. Due to a decreasing focus on perceptually prominent elements, children’s attention shifts from perceptually salient production features such as lively pacing, auditory change, and animation in early childhood to information and narrative content in later years (Anderson & Levin, 1976; Valkenburg & Vroome, 2004). In addition, the perceived personal relevance of a message will vary greatly by developmental level, mostly with respect to the particular product categories advertised. Children in early and middle childhood are interested mainly in toys and games, and in late childhood they are more involved with functional products such as school stationary and due to the growing importance of peer acceptance adolescents are most interested in products with a social function, such as CDs and cell phones (Buijzen & Valkenburg, 2000).

Second, development is also likely to interact with the RR by a message. Due to increasing cognitive abilities to understand and process media messages, the level of RR to process a message is likely to decrease as children get older. For example, camera changes, cuts, and nonchronological scene order may be too complex for young children, but not for older children who have more advanced cognitive abilities and media experience to understand such features (Valkenburg, 2004). Likewise, due to developing cognitive abilities and accumulating experience with interactive media, the RR by interactivity might also diminish in the course of childhood. Consequently, cognitive overload as a result of message complexity or interactivity is more likely to occur among younger than among older children.

Finally, the role of integration between the persuasive message and its context may also vary by age. Numerous studies investigating children’s recognition of traditional television commercials have shown that young children experience difficulty distinguishing advertising from programs (e.g., Ali et al., 2009; Bijmolt, Claassen, & Brus, 1998; Butter, Popovich, Stackhouse, & Garner, 1981; Rozendaal, Buijzen, & Valkenburg, 2010a). From around age 5, children can distinguish advertising based on perceptual features, and from the age of 8 they recognize advertising based on its selling intent. A recent study that compared traditional versus nontraditional types of advertising found that children had most difficulty recognizing the more integrated and embedded types of advertising, such as brand placement in movies and games (Owen et al., 2009). Therefore, we expect that the integration factors might play a more important role among younger than older children.

Conclusions and implications
Over the past decade, advertisers have rapidly adopted new media technologies to target children and adolescents. The growing amount of media tools at the disposal
of marketers, in combination with the financial attractiveness of the youth market, give reason to expect that this trend will continue to rise in the next decade. Given the fundamental differences of these new advertising practices compared with traditional advertising formats, there is a vital need to study the content, processes, and consequences of the new commercialized media environment for children and adolescents. Therefore, in this article we introduced the PCMC model, an investigative framework for future research on processing of commercialized media. Specifically, we (a) introduced a triple-level model of young people’s persuasion processing, (b) developed a RA/RR ratio framework to theorize as to how media content can affect young people’s processing of persuasive messages, and (c) identified specific message characteristics that may affect RA and RR and, thus, the level of persuasion processing.

By bringing together theories on adult persuasion, consumer development, and information processing, we provided a sophisticated overarching theory of young people’s processing of persuasive messages. Thus far, the persuasion processing literature has predominantly focused on adults, and the mechanisms underlying advertising effects among children have received far less research attention. Importantly, by applying a developmental perspective to a triple-level persuasion processing model, we have demonstrated that children may be particularly sensitive to less elaborate processing mechanisms, such as heuristic and automatic processing. Furthermore, they are expected to be especially receptive to emotional appeals and can be influenced without even being aware of a message and its persuasive intent. This lower-level processing may be enhanced by message characteristics such as format integration, an entertainment-based content style, or a highly emotive medium context.

To understand and predict the impact of the new media environment, including its undesired consequences, it is crucial that future research takes into account how children in different age groups process persuasive messages. Detailed insights into various levels of processing can provide a basis for marketing-related policies and intervention strategies. To reveal the persuasion process, experimental research should test children’s cognitive elaboration in response to persuasive messages, which can be assessed through thought-listing and think-aloud measurement techniques (Lodge, Tripp, & Harte, 2000; Rozendaal, Buijzen, & Valkenburg, 2010b; Van Someren, Barnard, & Sandberg, 1994). In addition, the various processes can be revealed by comparing implicit versus explicit measures of persuasion process variables. For example, in adult research explicit memory measures have been used to indicate more elaborate processing, while implicit memory and attitudes tap less elaborate processing mechanisms (Dijksterhuis et al., 2005; Heath, 2000; Yang & Roskos-Ewoldsen, 2007).

Further, we facilitated the link between theory and empirical advancement by proposing specific characteristics of the persuasive message and its context that may lead to certain levels of persuasion processing (i.e., personal relevance, perceptual prominence, complexity, interactivity, content style, integration). These factors can be applied in several ways. First, they can be used in content analysis of children’s commercial media landscape, enabling predictions how commercial content in
various media will be processed. Second, the factors can be tested in audience response studies investigating the role of message variations in young people’s processing. Specifically, future research could investigate the relative impact of and interactions between the factors, thus showing how they interact with recipient characteristics. Finally, experimental designs can use the factors as criteria for designing stimulus materials. Although we focused on persuasive communication, our framework can also be relevant for research focusing on other aspects of the media environment, including information, entertainment, and entertainment education materials.

Over the past years, a number of researchers have started to explore the relatively new research domain of the commercialized media environment (e.g., Alvy & Calvert, 2008; Auty & Lewis, 2004; Mallinckrodt & Mizerski, 2007; Moore & Rideout, 2007; Owen et al., 2009, 2010). In view of the growing public concern about the commercialization of the media environment in most welfare states, this important pioneering work is likely to be followed by a dramatic increase of research attention. In these early stages of an emerging new research field, there is not only a great need but also a great opportunity for theory development. It should be noted that although our framework is grounded in well-established theories and supported by empirical data, it has not been tested systematically. Future research is needed to validate and further refine the model. The PCMC model can serve as a starting point and investigative framework.

Acknowledgments

The Netherlands Association for Scientific Research (NWO) provided funding for the model development. The authors would like to thank Esther Rozendaal, Patti M. Valkenburg, and three anonymous reviewers for their valuable comments and suggestions.

References


A Processing Model for Commercial Media Content


A Processing Model for Commercial Media Content  M. Buijzen et al.


PCMC 模型：年轻人处理商业媒介信息的研究框架

【摘要：】

对儿童和青少年不断变化的商业媒体环境的评价迫切需要得到改变。本文介绍了年轻人处理商业媒体内容（PCMC）的研究框架，使其具有处理当前和未来的媒体研究的潜力。为发展该框架，我们 (1) 通过从发展的视角采用成年人对说服信息的处理模式，提出一个年轻人对说服信息处理的一体化模式；(2) 利用有限能力信息处理理论指导传播在预测说服信息处理的理论化问题；(3) 确定影响说服信息处理的信息特点（如显著性，互动性，整合性）。因此，PCMC 模型不仅提供了理论框架，并为将来商业化的青少年媒介环境的研究提供了具体准则。
Une présentation du modèle TCMC : un cadre d'étude pour le traitement des contenus médiatiques commerciaux chez les jeunes

Il faut remettre à jour l'évaluation de l'environnement médiatique commercial changeant des enfants et des adolescents. Dans cet article, nous présentons un cadre d'étude pour le traitement des contenus médiatiques commerciaux chez les jeunes (TCMC). Ce cadre peut gérer les développements actuels et futurs dans le paysage médiatique. Pour développer ce cadre, (1) nous présentons un modèle intégré du traitement de la persuasion chez les jeunes, en adoptant une perspective développementale des modèles de persuasion des adultes; (2) nous théorisons sur les manières dont la communication peut prédire le traitement de la persuasion, à partir d'une approche du traitement de l'information à capacité limitée; (3) nous identifions des caractéristiques spécifiques des messages qui influencent le traitement de la persuasion (p. ex., la saillance, l'interactivité et l'intégration). Ainsi, le modèle TCMC offre un cadre théorique ainsi que des directives spécifiques pour la recherche future sur l'environnement médiatique commercialisé des jeunes.
Das PCMC-Modell: Ein investigatives Bezugssystem für die Verarbeitung von werblichen Medieninhalten durch Jugendliche

Es gibt einen Bedarf für eine aktualisierte Bewertung der sich veränderten werblichen Medienumgebung von Kindern und Jugendlichen. In diesem Aufsatz diskutieren wir ein investigatives Bezugssystem für die Verarbeitung von werblichen Medieninhalten durch Jugendliche (PCMC-Modell), welches sich aktuellen und zukünftigen Entwicklungen der Medienlandschaft anpasst. Um dieses Bezugssystem zu entwickeln, stellen wir (1) ein integratives Modell der Verarbeitung von Persuasion durch Jugendliche vor, welches eine Entwicklungsperspektive in die Auseinandersetzung mit Persuasionsmodellen für Erwachsene einbringt; (2) theoretisieren basierend auf einem Ansatz der Informationsverarbeitung mit begrenzten Kapazitäten (limited capacity approach), wie Kommunikation persuasive Prozesse vorhersagen kann und (3) identifizieren spezifische Botschaftseigenschaften, die die Verarbeitung von Persuasion beeinflussen (z.B. Prominenz, Interaktivität, Integration). Damit bietet das PCMC-Modell einen theoretischen Rahmen sowie spezifischen Anweisungen für zukünftige Forschungsarbeiten, die die kommerziellen Medienumgebungen Jugendlicher untersuchen.
상업미디어콘텐츠를 위한 과정모델

요약

어린이들과 어른들의 변화하는 상업미디어 환경에 대한 평가를 새로이 할 필요성이 높아지고 있다. 본 논문은 미디어 환경내에서 현재와 미래발전을 설명할 수 있도록, 젊은이들의 상업미디어콘텐츠를 위한 조사적인 프레임을 도입하였다. 이 프레임을 발전시키기 위해, 우리는 (1) 성인설득모델에 대한 발전적 개념을 채용, 젊은이들의 설득과정의 통합모델을 도입하였으며, (2) 어떻게 커뮤니케이션이 설득과정을 예측하는가에 대한 이론화를 단행하였고, (3) 설득과정에 영향을 미치는 특정한 메시지 특성들을 발견하였다. 따라서 PCMC 모델은 젊은이들의 상업화된 미디어 환경을 연구하는 미래연구를 위해 특정한 지침을 제공함은 물론, 이론적 프레임 또한 제공하였다.
Un Modelo de Procesamiento para el Contenido Comercial de los Medios

Resumen

Hay una necesidad vital de actualizar la evaluación del cambiante ambiente comercial de los medios para niños y adolescentes. En este ensayo, introducimos un marco investigativo para el procesamiento del contenido comercial de los medios por parte de las personas jóvenes (PCMC) que permita abordar los desarrollos corrientes y futuros del paisaje de los medios. Para desarrollar este marco, (1) introducimos un modelo integrado del procesamiento persuasivo de las personas jóvenes, adoptando una perspectiva de desarrollo de los modelos persuasivos adultos; (2) teorizamos cómo la comunicación puede predecir el procesamiento persuasivo, basado en un enfoque de la capacidad limitada de procesamiento de la información; (3) identificamos las características específicas de los mensajes que afectan el procesamiento persuasivo (a saber, prominencia, interactividad, integración). Así, el modelo PCMC provee de un marco teórico así como también de guías para la investigación futura sobre el ambiente de comercialización de los medios para la gente joven.