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Article in *International Journal of Advertising* · January 2008

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Who's messing with my mind?

The implications of dual-process models for the ethics of advertising to children

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The debate surrounding the ethics of advertising to children generally centres on the age at which children have developed sufficient cognitive resources both to understand the persuasive intent of marketing messages and to critically evaluate them. In this paper we argue that this debate requires urgent updating to take into account recent and significant findings from psychology and neuroscience. Substantial evidence now shows that judgements and behaviours, including those relating to consumption, can be strongly influenced by implicitly acquired affective associations, rather than via consciously mediated persuasive information. Contemporary advertising formats typically targeted at children are particularly likely to 'implicitly persuade' in this way. The implications for the ethical and empirical agenda are profound, pointing the way for a re-evaluation of what constitutes responsible children's advertising, a new research agenda and a new approach to media literacy strategies.

Introduction

When is it fair to advertise to children? This debate has focused largely on deciding upon the age at which children acquire an acceptable degree of 'persuasion knowledge' (Moses & Baldwin 2005; Wright *et al.* 2005). That is, the age at which children can recognise advertising, understand its selling and persuasive intent, and use this understanding in evaluating the advertised product or service. Increasingly, however, research shows that older children with a greater degree of persuasion knowledge are no less influenced by advertising than are younger children. This paper argues that these seemingly counterintuitive findings can be accounted for by

substantial evidence from cognitive psychology and neuroscience, that implicitly acquired affective associations ('implicit attitudes') strongly influence judgement and behaviour. While marketers have traditionally been concerned with explicit attitude change, we show that advertising that links products with positive stimuli can effect implicit attitude change, a process we refer to as 'implicit persuasion'.

The paper also examines the substantial changes in children's advertising formats since the debate about the ethics of advertising to children was framed. Contemporary formats deliver subtle affective associations rather than a rational or factual message, and are therefore perfectly placed to bypass children's explicit persuasion knowledge and instead persuade implicitly. We conclude that the implications for the ethical agenda are substantial, and make recommendations for future collaborative research between marketers, psychologists and neuroscientists, and suggestions for public policy.

Cognitive defence

In addressing the fairness of advertising to children, the goal of public policy has generally been to establish the 'magic age' at which children are able to understand advertisers' motives and develop 'coping skills' (Friestad & Wright 2005, p. 183). Indeed, as Moore (2004, p. 162) has noted, this capacity is regarded as a 'developmental milestone' by researchers and policymakers, since, prior to the acquisition of persuasion knowledge, children are assumed to be especially vulnerable to advertising. As an American Psychological Association (APA) report put it:

... it is unfair and deceptive for commercials to bypass the cognitive defenses against persuasion which adults are presumed to have when they understand that a given message consists of advertising content and can identify the source of the message. If it is unfair and deceptive to seek to bypass the defenses that adults are presumed to have when they are aware that advertising is addressed to them, then it must likewise be considered unfair and deceptive to advertise to children in whom these defenses do not yet exist.

(APA 2004, p. 21)

The theoretical underpinnings of this debate stem almost exclusively from the field of developmental cognitive psychology, and specifically from the work of Jean Piaget (1896–1980). Almost half a century ago,

Piaget (1960) proposed an age-stage model of childhood cognitive and social development in which the child's mental and interactive capacities evolve in a linear fashion through a set of biologically predetermined stages: 'sensorimotor', age 0–2; 'pre-operational', age 2–7; 'concrete operational', age 7–11; and 'formal operational', age 11 onwards. More recently, other approaches from cognitive psychology have been used, such as information processing (Roedder 1981) and social perspective taking (Selman 1980); and, over the past several years, Deborah Roedder John's (1999) highly influential review of 25 years of children's consumer socialisation literature has firmly consolidated a developmentalist view of the child's relationship with commercial communications. She proposes a three-stage consumer socialisation process for children: 'perceptual' stage, age 3–7; 'analytical' stage, age 7–11; and 'reflective' stage, age 11–16. The most recent theoretical addition to the debate is Moses and Baldwin's (2005) explications of children's theories of mind and executive functioning, which have provided an even finer-grained understanding of children's cognitive development. Taken together, the changes children undergo in cognitive and social maturation have been assumed to explain many of the changes observed in children's cognitive advertising defences as they grow older.

Yet despite common acknowledgement of these cognitive developmental milestones, the way this gradually acquired competence helps children to understand advertising intent, and to guard against it, remains somewhat contested. It is generally accepted that, towards the middle of the perceptual stage (age 4 or 5), children are capable of distinguishing an advert from a programme by its length and format (e.g. Blatt *et al.* 1972; Levin *et al.* 1982). It is also thought that by somewhere during the analytical stage (7–11) children begin to understand selling intent (Macklin 1987; Oates *et al.* 2003). However, there is less agreement about children's capabilities within the reflective stage (11–16); in particular, whether understanding selling intent ('I know that company A is trying to sell me their product') involves the same developmental skill set as understanding persuasive intent ('I know that company A is trying to make me change my mind'). Indeed, a very recent experiment, for the first time specifically comparing children's cognitive defences against an adult benchmark, reported that while children did indeed begin to show an understanding of selling intent from age 8, at 12 they had still not acquired

an understanding of persuasive intent on a par with adult levels (Rozendaal *et al.* 2008).

When cognitive defence does not defend

Most importantly, the evidence concerning whether understanding either selling or persuasive intent automatically implies ‘online’ scepticism is also contested. Bjurström (1994) found no evidence of scepticism until around the age of 12, while Brucks *et al.* (1988) reported that even having the ability to be sceptical does not necessarily mean that such abilities will be engaged – a finding upheld by Moses and Baldwin (2005), who note that ‘merely having the concepts in some latent form does little if anything to prevent children from being led astray by advertising’ (p. 197). Indeed, an increasing number of researchers note that there are scarce empirical grounds for the assumption that persuasion knowledge enables a child to make a practical independent and informed assessment of the potential effects of advertising on their consumption behaviour (Livingstone & Helsper 2006). For example, although Kunkel and colleagues (APA 2004, p. 16) have argued that ‘[r]esearch corroborates the more effective power of commercials on younger children who do not yet comprehend the persuasive intent of advertising’, they acknowledge that there is little direct support for this hypothesis. Studies that have compared under-12 age groups generally find little or no effect of age or persuasion knowledge on children’s preferences for advertised products (Christenson 1982; Kunkel 1988; Mallinckrodt & Mizerski 2007). Moreover a number of recent studies involving advertising across a range of media show that even those aged 11 and above (the stage at which persuasion knowledge should come ‘online’) do not show the expected increase in resistance to advertising. Livingstone and Helsper’s (2006) review of 50 studies into the influence of TV advertising on food choice examined evidence of effects in three age ranges: 2–6 years, 7–11 years and 12–16 years. They actually found no evidence of lesser influence with age, with the weakest effects observed in the youngest age group. Similarly, Auty and Lewis (2004) found that seeing a branded movie clip (with previous exposure to the film) increased the likelihood of choosing the brand soon after watching the film – and it did so as much in the older group of 11–12 year olds as in the younger 6–7-year-old group. Examining the effects of celebrity endorsement on

8–10 and 11–14-year-old boys, Ross *et al.* (1984) found no evidence for stronger influence in the younger age group in terms of preference for the advertised toy over others. The authors concluded that '[c]ontrary to the speculation of many researchers, understanding about advertising intent and techniques and cynicism about ads had almost no influence on product preference after viewing' (p. 185).

These findings clearly challenge the idea that the cognitive defences of children in Piaget's 'formal operation' category or Roedder John's 'reflective' group enable them to better resist advertising messages than younger children without such defences. Yet, despite this, both critics and defenders of advertising to children continue to scope out approaches that address the ethics of advertising to children within the framework of the age-stage evolution of children's cognitive capacities. Critics approach the ethical problem of advertising to those with limited cognitive defences through the removal of advertising to that target audience. The Greek government, for example, has prohibited adverts for children's products on TV between 7am and 10pm, and since 1996 Sweden has banned both TV commercials designed to attract the attention of the under-12s and commercials around children's programmes (Olsen 2008). Meanwhile, those who defend the practice of advertising to children have argued that being the target of advertising comprises an important part of children's consumer socialisation (e.g. Furnham 2002). For these commentators, the solution to protecting children with underdeveloped cognitive capacity lies in media literacy strategies that enhance persuasion knowledge. Oates *et al.* (2001, p. 244), for example, showed that 'advertisements do make an impression on children, but the majority of children in this study did not recognise their persuasive intent'. Rather than banning advertising, their proposal was that 'children need to be better informed about the nature and intent of advertising'.

Both these approaches are problematic. Apart from the difficulties surrounding a definition of what is 'designed to attract the attention of the under-12s', the attempts by Greece and Sweden to regulate have recently been undermined by cable and satellite television stations, which broadcast children's programmes from outside Greece or Sweden and thus do not have to comply with national regulation. It is also interesting to note that regulation tends to be applied only to TV advertising. Most recently, for example, the UK decision by Ofcom (2006) to ban the advertising of

high salt, sugar and fat products around 'programmes of particular appeal to children under 16' applies only to TV. As for strategies to boost persuasion knowledge, while a number of media literacy programmes have recently been developed (e.g. MediaSmart in the UK (<http://www.mediasmart.org.uk>) and Concerned Children's Advertisers in Canada (<http://www.cca-kids.ca>), the inadequacy of efforts to measure their effectiveness has already been noted (Eagle 2007). Moreover, if persuasion knowledge is not associated with increased resistance to advertising, then it is not clear what benefit persuasion knowledge training could be expected to bring in terms of helping children to resist the influence of advertising.

We will turn shortly to new discoveries in psychology and neuroscience that can account for the limitations of a cognitive defence account of children's resistance (or lack of it) to persuasive intent, but, first, trends in advertising formats must be examined.

Contemporary advertising formats

The advertising landscape has changed dramatically since the Piagetian model of children's cognitive development was first applied to the advertising ethics debate. Wright *et al.* (2005) note that the vast majority of developmental studies on children and advertising were carried out during a 15-year period from the early 1970s to the late 1980s (e.g. Blatt *et al.* 1972; Rossiter & Robertson 1974; Roberts 1982; Macklin 1987), an observation supported by Moore (2004), who notes that significantly less research has been carried out since the late 1980s. While advertising during that period consisted mainly of 30-second TV spots, which were mainly factual or propositional in content, the nature, diversity and sheer volume of marketing activity directed at children has changed substantially since this time. Children in the UK now spend an average of five hours in front of a screen every day (ChildWise 2007/8) and the figures are similar in the US (Rideout *et al.* 2005) and other parts of Europe (Cooke 2002). Much of this is still TV time but a rising proportion is spent on internet entertainment, which is almost entirely funded by commercial interests (Fielder *et al.* 2007; Buckleitner 2008), and console games, which are increasingly embedded with sophisticated product placements that pay for high-tech game development (Nelson 2005). Almost 79% of

5–16 year olds have a TV in their room, and a quarter also have their own internet access (ChildWise 2007/8), which means they interact with an array of commercial messaging formats alone, with no adult to guide what they encounter.

Covert and stealth marketing is also on the increase (Kaikati & Kaikati 2004; Sprott 2008). These are practices where the true relationship with the company that produces or sponsors the marketing message is not entirely clear (Martin & Smith 2008). Formats include viral marketing – spreading brand-sponsored films and games by email (Marsden 2006); brand pushers – children hired by companies to recommend products to their friends (Acuff 2005; Martin & Smith 2008); celebrity or character endorsement (Erdogan 1999); product placement in films, TV shows, games and social networking sites (Carter 2007); sponsored ‘advergames’ on children’s websites (Dahl *et al.* 2006); movie tie-ins and brand mentions in pop songs (Kaikati & Kaikati 2004). A recent review of children’s internet sites showed that 73% of online advertising was covert in that it was integrated into the entertaining content (Fielder *et al.* 2007) rather than clearly labelled on a separate part of the screen. These new ambient, and often interactive, formats clearly constitute a move away from information-based advertising, which presents facts about the product. Rather, they involve an evaluative conditioning format in which the product or brand is linked with rewarding stimuli. Indeed, even the nature of traditional children’s TV advertising has changed. A recent content analysis of children’s television food advertising in Australia found fantasy, fun and humour were the most common promotional appeals made to children (Roberts & Pettigrew 2007).

Behind the changes in advert execution lies the contemporary corporate emphasis on building brand equity (Feldwick 2002), which is defined by Keller and Lehmann (2003, p. 28) as ‘everything that exists in the minds of the customer with respect to a brand (e.g. thoughts, feelings, experiences, images, perceptions, beliefs and attitudes’. Plassmann *et al.* (2007, p. 153), in their review of how advertisers can learn from neuroscience, note that the mindset created by this collection of associative brand memories influences purchase decisions and ultimately corporate profitability. As global brands seek competitive advantage, garnering the loyalty of an ever younger consumer set is clearly desirable (Lindstrom & Seybold 2004). It is important, then, to note that in the examples discussed

previously in which older children (with cognitive defences) were no less influenced than younger children, the advertising in question often consisted of exercises designed to create positive brand memories by the use of attractive celebrities, engaging internet advergames and product placements in favourite films: formats that deliver subtle affective associations rather than a rational or factual message.

In summary, the empirical data outlined in the first part of this paper contest the predictions of cognitive defence accounts. Moreover, changes in the intent behind and execution of contemporary children's advertising formats mean that such marketing techniques make use of evaluative conditioning rather than explicitly persuasive information. Together, these two strands of research challenge the relevance of persuasion knowledge and cognitive defence when advertising formats do not persuade explicitly (i.e. there is no propositional information that the child can critically assess and evaluate in light of knowledge of the selling or persuasive intent of the message). In the following section, we turn to substantial and significant findings from both psychology and neuroscience that, by offering a model of the effects of evaluative conditioning on consumers, help explain why cognitive defence no longer defends even older children.

Illumination from psychology and neuroscience: dual process models

Dual process models contrast implicit processes (also known as automatic, reflexive, impulsive or System 1 processes) with explicit mental processes (controlled, reflective, deliberative or System 2). Implicit processes are thought to be activated automatically and effortlessly, without intention or awareness, and may be difficult to control. By contrast, explicit processes are characterised as effortful (i.e. they require cognitive control resources), intended and consciously accessible, relative to implicit processes. Dual process models have been used to describe the different contributions of implicit and explicit processes to a wide range of behaviours, including recognition memory (e.g. Jacoby 1991; Wixted 2007), persuasion (Chen & Chaiken 1999; Petty & Wegener 1999), attitudes (e.g. Devine 1989; Greenwald & Banaji 1995; Wilson *et al.* 2000; Gawronski & Bodenhausen 2006), social behaviour (e.g. Strack & Deutsch 2004), and judgement and decision making (e.g. Slovic 1996).

Previous researchers have usefully applied more than one of the many dual process models mentioned above to the consumer domain. For example, the dual process model of persuasion has long been used to illuminate the effectiveness of persuasive advertising messages on explicit attitude change (see Johar *et al.* 2006), while other researchers have begun to explore the consumer implications of dual process models of recognition memory (e.g. Shapiro & Krishnan 2001; Goode 2007) and decision making (e.g. Shiv & Fedorikhin 2002). Here, however, we focus on theory and research from dual process models of *attitudes*, which we believe promise to offer the best account of the effects of contemporary advertising practices on children.

Dual process attitude models

Dual process attitude models distinguish 'explicit attitudes' (self-reported, deliberated evaluations) from 'implicit attitudes', which are based on 'automatic affective reactions resulting from the particular associations that are activated automatically when one encounters a relevant stimulus' (Gawronski & Bodenhausen 2006, p. 693). These associations are thought to develop through the preconscious and automatic strengthening of associations between concepts over the course of a number of experiences, in a way that 'reflects correlations between aspects of the environment and cognitive, affective, or motor reactions' (Strack & Deutsch 2004, p. 223). Evaluative conditioning thus provides the 'prototypical' means of implicit attitude formation and change (see Gawronski & Bodenhausen 2006, p. 697).

Implicit attitudes are most often measured using psychological tests that limit the individual's opportunity to exert control over her responses or behaviour. For example, the most popular measure of implicit attitudes is the Implicit Association Test, or IAT (Greenwald *et al.* 1998; see Nosek *et al.* 2005 for a methodological and conceptual review of the use of the IAT). In this test, participants must pair together categories of words or pictures: for example, white faces with pleasant words and black faces with unpleasant words. Participants in this classic study of unintended bias against stigmatised groups often found that pairing easier than the opposite pairing (black faces with pleasant words, and white faces with unpleasant words). The small but significant difference in reaction time that this commonly creates is taken as a measure of fast, automatic and possibly

unidentified associations between black people and negativity, relative to white people (e.g. Nosek *et al.* 2002).

As Sherman *et al.* (2008) have pointed out, common to all dual process models is the role of resource-dependent ‘cognitive control’ processes in overcoming the effects of automatically activated implicit processes (such as controlling inadvertent prejudice). Thus, cognitive control is required to overcome an automatically based response tendency that conflicts with consciously held beliefs or goals, as well as to ‘overcome inappropriate automatic influences’ (p. 320) and instead ensure that an accurate judgement is made. In the dual process attitude literature, both behavioural and brain data point to a distinction between automatically activated attitudes and the effortful self-regulatory processes necessary to overcome them. Behaviourally, it has been shown that when the individual lacks either the ability or motivation to deploy cognitive control in order to overcome an ‘unwanted’ response or judge correctly, implicit attitudes become better predictors of behaviour or judgement. For example, implicit social attitudes have a greater influence on behaviour when choices or judgements are made spontaneously (e.g. Dovidio *et al.* 1997; Rydell & McConnell 2006), under time pressure (e.g. Payne 2001) or when cognitive control reserves are either temporarily (e.g. Govorun & Payne 2006) or chronically low (e.g. Payne 2005).

Neuroscientific data are also consistent with this interaction between implicit and explicit attitudes. Studies using social stimuli (for example, faces of members of stigmatised groups) suggest that at least partially distinct brain networks are involved in the activation, versus the detection and regulation of automatically activated attitudes (see Stanley *et al.* 2008). Thus the amygdala is implicated in the automatic activation of implicit social attitudes, while the anterior cingulate and dorsolateral prefrontal cortex are implicated in the detection of conflict between biased implicit and more egalitarian explicit attitudes, and the regulation of influence of implicit attitudes on behaviour (e.g. Phelps *et al.* 2000; Richeson *et al.* 2003; Cunningham *et al.* 2004; Amodio *et al.* 2008; for a summary, see Stanley *et al.* 2008). Similarly, cognitive neuroscientific accounts of moral judgement posit that automatic, affectively charged moral attitudes, underpinned by brain networks involved in socio-emotional processing, are effortfully overcome by self-regulatory processes subserved by the dorsolateral prefrontal cortex (e.g. Greene & Haidt 2002; Greene *et al.* 2004; Haidt 2007).

Implicit persuasion

Researchers have begun to explore the contribution of implicit consumer attitudes to consumer behaviour. This research suggests that implicit consumer attitudes have validity, enhance the predictability of behaviour over and above that provided by explicit attitudes, and are distinct from explicit attitudes (e.g. Maison *et al.* 2001; Brunel *et al.* 2004; Maison *et al.* 2004; Friese *et al.* 2006). More recently, research has shown how advertising messages can influence implicit attitudes towards products. Importantly, this can occur in the absence of any change in explicit attitudes, thus making it unlikely that implicit attitude change is merely a consequence of a changed explicit attitude. Czyzewska and Ginsburg (2007) found that anti-marijuana public service announcements made implicit attitudes more negative to the drug, but not explicit attitudes. Dal Cin *et al.* (2007) showed young men a film clip in which the male protagonist (Bruce Willis) either does, or does not, smoke. Seeing the protagonist smoke did not affect explicit ratings of the positive/negative image of people smoking cigarettes. But for those who identified with the protagonist, seeing him smoke in the film resulted in stronger implicit associations between smoking and the self (and, for smokers, increased intention to smoke). Gibson (2008), by pairing Coke and Pepsi logos with positive or negative images and words, brought about implicit attitude change in participants who initially had no strong preference for either brand. Their explicit attitudes towards the two drinks, however, remained unaffected. Forehand and Perkins (2005) found that identifying the celebrity in advertisement voiceovers protected viewers against explicit, but not implicit, brand attitude change. Thus, in each of these studies, implicit attitude change occurred independently of explicit attitude change.

In other cases, implicit attitude change in response to advertising may affect explicit consumer attitudes, too. Volunteers exposed to subliminal presentations of happy faces before being offered a fruit-flavoured drink rated it as tastier, drank more of it and were willing to pay more for it, compared with volunteers exposed to angry faces (Berridge & Winkielman 2003). Although this study involved subliminal stimuli – which are illegal for use in advertising – as Bargh (2002) has noted, what is important is not that stimuli are consciously imperceptible but that the consumer does not realise that they are being influenced, or think themselves immune to that influence.

In line with this view, Forehand and Perkins (2005) found that celebrity voiceovers had the desired effect on explicit, as well as implicit, brand attitudes so long as viewers did not recognise the celebrity's voice and were thus, presumably, not motivated to correct for the celebrity's influence.

Importantly, even in the absence of effects on explicit attitude change, implicit persuasion can influence consumer behaviour. In line with evidence from the social psychological literature, research in the consumer domain finds that implicit attitudes drive behaviour in 'low control' situations: for example, spontaneous choices – choosing sweet treats versus fruit (Perugini 2005); time-pressured choices – choosing branded versus generic products (Friese *et al.* 2006); choices made under cognitive load – choosing between two soft drinks (Gibson 2008); or consumer behaviour in a state of 'ego' depletion – amount of candy eaten (Hofmann *et al.* 2007).

In summary, recent advances in psychology and neuroscience have shown the operation of dual processes whereby implicit processes that are automatic and unintended can be controlled only with difficulty by conscious, effortful cognitive activity. As noted earlier, evaluative conditioning is a powerful means of implicit attitude change (Gawronski & Bodenhausen 2006). In line with this, the pairing of products with positive stimuli can effect implicit attitude change, in the absence of explicit attitude change. Implicit consumer attitudes, in turn, can direct consumer choices even when they conflict with the individual's explicit consumer attitude in low-control situations (Friese *et al.* 2006). Indeed, recent work by Gibson (2008) charts this process in a single study where evaluative conditioning of a soft drink brand altered implicit attitudes, which in turn partially mediated soft drink choice under cognitive load. We propose, then, that contemporary marketing techniques that link products with positive stimuli can elicit a preference for or choice of that product by non-conscious, non-rational means, and may even undermine consciously held attitudes.

Implicit defence

The phenomenon of 'implicit persuasion' – together with the modern formats of advertising to children – provides a compelling explanation for why cognitive defence (as traditionally understood) does not protect older children with more developed cognitive capacities any better than it does younger children in an earlier stage of cognitive development. An

age-stage approach no longer provides the right ethical benchmark for assessing the fairness of advertising to children.

Instead, the ethically appropriate question for contemporary advertising formats is, at what age can children resist implicit persuasion? For a defence of this nature to be truly in place, the young person must be able not only to understand implicit persuasion but also to be able to control its effects on their consumer preferences and behaviour – in other words, ‘correct’ or overcome implicit consumer attitudes in choice situations. Thus by ‘resist’ we mean that the child’s self-reported explicit attitudes are not substantially mediated by their manipulated implicit attitudes and that, when they diverge, they are able to make consumer choices in line with their explicit attitudes, rather than their manipulated implicit attitudes, in reasonably naturalistic choice situations. We doubt that there will be any ‘magic age’ at which children will attain these abilities, as this will depend on the advertising format under discussion. (For example, the implicit persuasion of product placement might be easier to resist than that of celebrity endorsement.)

However, it is nonetheless useful to turn to recent psychological and neuroscientific evidence, this time to inform the question as to when and how young people might develop this capacity.

Behavioural data exploring people’s capacity to overcome implicit social attitudes suggest that this ability is partly dependent on cognitive control capacities as well as motivational factors (e.g. Payne 2005; Govorun & Payne 2006). The ability to control behaviour in a goal-directed fashion is the hallmark of mature psychological functioning. Recent research now points to an ability that continues to improve throughout adolescence and into early adulthood (e.g. Adelman *et al.* 2002; Luna *et al.* 2004), while neuroimaging data suggest that substantial growth, change and fine-tuning of the neural circuitry underpinning cognitive control occurs between adolescence and adulthood (e.g. Giedd *et al.* 1999; Spear 2000; Sowell *et al.* 2001, 2002; Adelman *et al.* 2002; for overviews see Yurgelun-Todd 2007; Casey *et al.* 2008; Steinberg 2008). Significantly, a number of researchers have argued that a sub-adult level of cognitive control cannot on its own account for the sub-optimal behaviours associated with adolescence. Steinberg and others have suggested that the onset of puberty is associated with an enhanced responsiveness to rewarding stimuli, including socio-emotional stimuli, in the absence of any correspondingly rapid enhancement of cognitive control capacities (e.g. Steinberg 2007, 2008;

Casey *et al.* 2008). It has been suggested that it is not until early adulthood that the prefrontal brain regions involved in the modulation of emotional responses, and their interconnections, reach full maturity and achieve integration with other brain regions (see Steinberg 2004; Casey *et al.* 2005).

To the extent that adolescents are relatively sensitised to the rewarding stimuli used in evaluative conditioning formats, this may heavily compound disadvantages in cognitive control abilities. While adolescents' susceptibility to implicit persuasion relative to adults remains a hypothesis to be empirically tested against behavioural data, the substantial evidence that the brain undergoes considerable functional and structural changes between adolescence and adulthood suggests the strong possibility that teenagers will not yet possess an adult-like resistance to advertising and may possibly be even more susceptible than younger children (cf. Livingston & Helsper 2006). This possibility gains plausibility from other features of adolescence, such as heightened self-consciousness (Larson & Richards 1994) and the need to 'fit in' with peers (Steinberg & Silverberg 1986).

Conclusion

We began this paper by asking when it is fair to advertise to children. We agree that the presence of persuasion knowledge or cognitive defence, as traditionally understood, offers a reasonable test of fairness for informative advertising formats. However, applications of new findings from neuroscience and psychology show that advertising techniques that use evaluative conditioning formats manipulate consumer behaviour via implicit attitude change. We have argued that, for these formats, the appropriate test of fairness is the ability to resist implicit persuasion. Without this, the child is like the target of subliminal advertising: preferences are mediated by non-conscious, non-rational means that are impossible to resist. Moreover, we have outlined data to suggest that not only will pre-adolescent children fail to possess sufficient cognitive control capacities to resist implicit persuasion, but that even adolescents may have difficulty, relative to adults.

Recommendations for future research

New insights from psychology and neuroscience open up a rich new stream of advertising research. Our first recommendation is the initiation

of a research programme with children, adolescents and adults to empirically validate whether children's, adolescents' and, indeed, adults' cognitive control capacities are sufficient to enable them to resist implicit persuasion. While adult performance provides a natural benchmark, it should be noted that if adults were, like children, almost entirely incapable of resisting the implicit persuasion of evaluative conditioning advertising formats, we would not take this as evidence that such advertising is ethically unproblematic (for philosophical discussions of non-rationally mediated persuasion see, for example, Crisp 1987; Scoccia 1996; Nolan & West 2004). Indeed, the marketing literature has recently begun to consider the ethics of 'stealth marketing' to adults (e.g. Sprott 2008).

Second, research is needed to ascertain to what extent children and adolescents recognise the presence of brands in their lives as marketing techniques with selling intent, an issue on which there are currently scant data (Buckingham 2005). The 15 year olds in Fielder *et al.*'s (2007) qualitative study of internet advertising were not able to recognise the persuasive intent of advergames; findings of this nature now require quantitative verification. This is likely to be a large-scale undertaking given the many and various forms of marketing that use evaluative conditioning formats.

Third, a programme of research should be undertaken to evaluate the effectiveness of media literacy programmes in helping young people be cognisant of both explicit and implicit persuasion. This should, again, be comparative research with a wide age range of subjects, from children to adults. In particular, we think it essential that such research explore the effectiveness of media literacy programmes in attenuating the effects of advertising on both implicit attitude change and implicitly driven consumer choice.

Recommendations for public policy

While there is clearly still much research to be conducted through the cooperative efforts of marketers and researchers working in the sciences of mind, the findings presented above already have implications for public policy.

Our first recommendation is that these findings be placed firmly in the public domain to form an alternative point of reference for policy debate at a time when the ethics of advertising to children is a highly topical issue across the world. Evidence of harm to children from engagement with a consumer culture has recently been produced from a range of sources and countries

(Williams 2006; Innocenti 2007). Studies from the US (Schor 2004), the Netherlands (Buijzen & Valkenburg 2003) and the UK (Nairn *et al.* 2007) have shown links between advertising, materialism, pester power and, ultimately, with children's self-esteem, life satisfaction and relationship with parents. Meanwhile the UK government has just launched a year-long inquiry into the effect of the commercial world on children's well-being (DCSF 2008).

The evidence we have produced in this paper may serve to expand the terms of reference of such inquiries and debate. The recent Ofcom ruling on the banning of advertising of high salt, sugar and fat foods in programmes of particular appeal to the under-16s was surrounded by heated public debate revolving around the 'right age' at which cognitive defence is secure. Research evidence cited by both sides was drawn from publications such as the review published by Sonia Livingstone (2005) in this journal. She provides convincing grounds to suggest that advertising has but a 'modest direct effect' on children's eating habits. However, her thorough review of research literature does not extend to many of the findings presented here, and specifically work on implicit effects. Inclusion of this domain would shift the debate dramatically and it might well be found that the indirect implicit effects were very far from 'modest'.

Our second recommendation is for policy makers to consider not just the capacities of the targets of advertising messages but also the formats of the messages themselves. Martin and Smith (2008) have argued that stealth marketing techniques that can be shown to be deceptive, exploitative and intrusive should be subject to public scrutiny. While existing codes of ethical marketing practice (e.g. the American Marketing Association's Statement of Ethics (AMA 2008) or the American Psychological Association report (APA 2004) quoted at the beginning of this paper) make it clear that it is only fair to advertise to targets who are aware of persuasive intent, practice now includes a wide range of 'under the radar' messages appearing in non-commercial contexts such as movies, computer games, blogs and even social groups. Given that even adults may have difficulty recognising marketing messages when they are embedded in traditionally non-commercial contexts, the format as well as the targets should be considered when deciding on fairness. Even in the absence of empirical work, certain marketing practices, when viewed as forms of implicit persuasion, become instantly recognisable as being

ethically problematic (for example, endorsement by characters that appeal to very young children).

Our third recommendation relates to media literacy campaigns such as MediaSmart in the UK (<http://www.mediasmart.org.uk>) and Concerned Children's Advertisers (CCA) in Canada (<http://www.cca-kids.ca>). It is suggested that these do more than provide information about how messages are created and presented, and instead specifically educate children (and their parents) about advertising formats that can persuade without them even noticing. In contrast to MediaSmart and CCA, which are run by the advertising industry, a UK site run by the Food Commission, 'Chew on This' (www.chewonthis.org.uk), provides some of this perspective. The media literacy section entitled, 'Who's messing with my mind?' includes sections on celebrity endorsement, impulse purchase, movie tie-ins and product placement. We suggest that media literacy programmes should also educate about the non-conscious routes by which advertising can affect consumer preferences and behaviour.

Our final recommendation is that the advertising industry itself reconsiders how it can best approach responsible and ethical children's advertising. As Heath and Nairn (2005) pointed out recently, when Vance Packard's *Hidden Persuaders* came out in the late 1950s, one response of the advertising industry was to claim 'There are no hidden persuaders. Advertising works openly, in the bare pitiless sunlight' (Reeves 1961, p. 70). It is clear that, despite the best intentions of advertisers, much of advertising to children does not work like this at all, but instead operates darkly, beyond the light of consciousness. This poses a significant challenge that will become more demanding. Research from neuroscience and psychology will no doubt continue to indicate ways to implicitly persuade more effectively. This in turn will pose new ethical dilemmas for youth marketers who seek to develop marketing strategies in response to such research. We hope that the arguments and evidence brought together in this paper from consumer research, psychology and neuroscience will help to provide an expanded framework for future debates about the ethics of marketing to children.

References

- Acuff, D. (2005) Taking the guesswork out of responsible marketing. *Young Consumers*, 6(4), pp. 68–71.

- Adelman, N.E., Menon, V., Blasey, C.M., White, C.D., Warsofsky, I.S., Glover, G.H. & Reiss, A.L. (2002) A developmental fMRI study of the Stroop color-word task. *Neuroimage*, **16**(1), pp. 61–75.
- American Marketing Association (AMA) (2008)
<http://marketingpower.com/content435.php> (accessed 26 May 2008).
- American Psychological Association (APA) (2004) Report of the APA Task Force on Advertising and Children. Section: Psychological issues in the increasing commercialization of childhood. Authors: Kunkel, D., Wilcox, B.L., Cantor, J., Palmer, E., Linn, S. & Dowrick, P. http://www.apa.org/releases/children_ads.pdf (accessed 10 July 2008).
- Amodio, D.M., Devine, P.G. & Harmon-Jones, E. (2008) Individual differences in the regulation of intergroup bias: the role of conflict monitoring and neural signals for control. *Journal of Personality and Social Psychology*, **94**(1), pp. 60–74.
- Auty, S. & Lewis, C. (2004) Exploring children's choice: the reminder effect of product placement. *Psychology & Marketing*, **21**(9), pp. 697–713.
- Bargh, J. (2002) Losing consciousness: automatic influences on consumer judgment, behavior, and motivation. *Journal of Consumer Research*, **29**(2), pp. 280–285.
- Berridge, K.C. & Winkielman, P. (2003) What is an unconscious emotion: the case for unconscious 'liking'. *Cognition and Emotion*, **17**, pp. 181–211.
- Bjurstrom, E. (1994) Children and television advertising: a critical study of international research concerning the effects of TV commercials on children. *Konsumentverket*, report 95(8).
- Blatt, J., Spencer, L. & Ward, S. (1972) A cognitive developmental study of children's reactions to television advertising, in Rubinstein, E.A., Comstock, G.A. & Murray, J.P. (eds) *Television and Social Behavior, Vol. 4, Television in Day-to-Day Life: Patterns of Use*. Washington, DC: US Department of Health, Education, and Welfare, pp. 452–467.
- Brucks, M., Armstrong, G.M. & Goldberg, M.E. (1988) Children's uses of cognitive defenses against television advertising: a cognitive response approach. *Journal of Consumer Research*, **14** (March), pp. 471–482.
- Brunel, F.F., Tietje, B.C. & Greenwald, A.G. (2004) Is the Implicit Association Test a valid and valuable measure of implicit consumer social cognition? *Journal of Consumer Psychology*, **14**(4), pp. 385–404.
- Buckingham, D. (2005) The media literacy of children and young people: a review of the research literature on behalf of Ofcom, at <http://www.ofcom.org.uk> (accessed 10 October 2006).
- Buckleitner, W. (2008) Like taking candy from a baby: how young children interact with online environments. *Consumer Reports WebWatch*.
<http://www.consumerwebwatch.org/dynamic/families-reports-kidsonline.cfm> (accessed 10 July 2008).
- Buijzen, M. & Valkenburg, M.P. (2003) The unintended effects of television advertising, a parent-child survey. *Communication Research*, **30**(5), pp. 483–503.
- Carter, M. (2007) Online drama proves a lucrative hit. *Guardian*, 12 November.
- Casey, B.J., Getz, S. & Galvan, A. (2008) The adolescent brain. *Developmental Review*, **28**(1), pp. 62–77.

- Casey, B.J., Tottenham, N., Liston, C. & Durston, S. (2005) Imaging the developing brain: what have we learned about cognitive development? *Trends in Cognitive Sciences*, **9**(3), pp. 104–110.
- Chen, S. & Chaiken, S. (1999) The heuristic-systematic model in its broader context, in Chaiken, S. & Trope, Y. (eds) *Dual-Process Theories in Social Psychology*. New York: Guilford Press, pp. 73–96.
- ChildWise (2007/8) *The Monitor Report: Children's Media Use and Purchasing (2007–8)* SMRC. Norwich: ChildWise.
- Christenson, P.G. (1982) Children's perceptions of TV commercials and products: the effects of PSAs. *Communication Research*, **9**(4), pp. 491–524.
- Cooke, R. (2002) Kids and media. *International Journal of Advertising and Marketing to Children*, **3**(4), pp. 29–36.
- Crisp, R. (1987) Persuasive advertising, autonomy, and the creation of desire. *Journal of Business Ethics*, **6**(5), pp. 413–418.
- Cunningham, W.A., Johnson, M.K., Raye, C.L., Gatenby, J.C., Gore, J.C. & Banaji, M.R. (2004) Separable neural components in the processing of black and white faces. *Psychological Science*, **15**(12), pp. 806–813.
- Czyzewska, M. & Ginsburg, H.J. (2007) Explicit and implicit effects of anti-marijuana and anti-tobacco television advertisements. *Addictive Behaviors*, **32**(1), pp. 114–127.
- Dahl, S., Eagle, L. & Baez, C. (2006) Analysing advergames: active diversions or actually deception. Discussion Paper Series, Middlesex University Business School.
- Dal Cin, S., Gibson, B., Zanna, M.P., Shumate, R. & Fong, G.T. (2007) Smoking in movies, implicit associations of smoking with the self, and intentions to smoke. *Psychological Science*, **18**(7), pp. 559–563.
- DCSF (2008) http://www.dfes.gov.uk/pns/DisplayPN.cgi?pn_id=2008_0070 (accessed 26 May 2008).
- Devine, P.G. (1989) Stereotypes and prejudice: their automatic and controlled components. *Journal of Personality and Social Psychology*, **56**(1), pp. 5–18.
- Dovidio, J.F., Kawakami, K., Johnson, C., Johnson, B. & Howard, A. (1997) On the nature of prejudice: automatic and controlled processes. *Journal of Experimental Social Psychology*, **33**(5), pp. 510–540.
- Eagle, L. (2007) Commercial media literacy: what does it do, to whom – and does it matter? *Journal of Advertising*, **36**(2), pp. 101–110.
- Erdogan, Z. (1999) Celebrity endorsement: a literature review. *Journal of Marketing Management*, **15**(4), pp. 291–314.
- Feldwick, P. (2002) *What is Brand Equity Anyway?* Henley-on-Thames: WARC.
- Fielder, A., Gardner, W., Nairn, A. & Pitt, J. (2007) *Fair Game? Assessing Commercial Activity on Children's Favourite Websites and Online Environments*. London: National Consumer Council.
- Forehand, M.R. & Perkins, A. (2005) Implicit assimilation and explicit contrast: a set/reset model of response to celebrity voice-overs. *Journal of Consumer Research*, **32** (December), pp. 435–441.
- Friese, M., Wänke, M. & Plessner, H. (2006) Implicit consumer preferences and their influence on product choice. *Psychology & Marketing*, **23**(9), pp. 727–740.

- Friestad, M. & Wright, P. (2005) The next generation: research for twenty-first century public policy on children and advertising. *Journal of Public Policy and Marketing*, **24**(2), pp. 183–185.
- Furnham, A. (2002) Children and advertising: politics and research in consumer socialization, in Hansen, F., Rasmussen, J., Martensen, A. & Tufte, B. (eds) *Children: Consumption, Advertising and Media*. Fredericksberg, Denmark: Samfundslitteratur Press, pp. 125–148.
- Gawronski, B. & Bodenhausen, G.V. (2006) Associative and propositional processes in evaluation: an integrative review of implicit and explicit attitude change. *Psychological Bulletin*, **132**(5), pp. 692–731.
- Gibson, B. (2008) Can evaluative conditioning change attitudes toward mature brands? New evidence from the Implicit Association Test. *Journal of Consumer Research*, **35** (June), pp. 178–188.
- Giedd, J., Blumenthal, J., Jeffries, N., Castellanos, F., Liu, H., Zijdenbos, A., Paus, T., Evans, A. & Rapoport, J. (1999) Brain development during childhood and adolescence: a longitudinal MRI study. *Nature Neuroscience*, **2**, pp. 861–863.
- Goode, A. (2007) The implicit and explicit role of ad memory in ad persuasion: rethinking the hidden persuaders. *International Journal of Market Research*, **49**(1), pp. 95–116.
- Govorun, O. & Payne, B.K. (2006) Ego-depletion and prejudice: separating automatic and controlled components. *Social Cognition*, **24**(2), pp. 111–136.
- Greene, J. & Haidt, J. (2002) How (and where) does moral judgment work? *Trends in Cognitive Sciences*, **6**(12), pp. 517–523.
- Greene, J.D., Nystrom, L.E., Engell, A.D., Darley, J.M. & Cohen, J.D. (2004) The neural bases of cognitive conflict and control in moral judgment. *Neuron*, **44**(2), pp. 389–400.
- Greenwald, A. & Banaji, M. (1995) Implicit social cognition: attitudes, self-esteem, and stereotypes. *Psychological Review*, **102**(1), pp. 4–27.
- Greenwald, A.G., McGhee, D.E. & Schwartz, J.L.K. (1998) Measuring individual differences in implicit cognition: the implicit association test. *Journal of Personality and Social Psychology*, **74**(6), pp. 1464–1480.
- Haidt, J. (2007) The new synthesis in moral psychology. *Science*, **316** (May), pp. 998–1002.
- Heath, R.G. & Nairn, A. (2005) Measuring affective advertising: implications of low attention processing on recall. *Journal of Advertising Research*, **45**(2), pp. 269–281.
- Hofmann, W., Rauch, W. & Gawronski, B. (2007) And deplete us not into temptation: automatic attitudes, dietary restraint, and self-regulatory resources as determinants of eating behavior. *Journal of Experimental Social Psychology*, **43**(3), pp. 497–504.
- Innocenti Research Centre (2007) *An Overview of Child Well-Being in Rich Countries*. UNICEF, Report card 7.
- Jacoby, L. (1991) A process dissociation framework: separating automatic from intentional uses of memory. *Journal of Memory and Language*, **30**(5), pp. 513–541.
- Johar, G.V., Maheswaran, D. & Peracchio, L.A. (2006) MAPping the frontiers: theoretical advances in consumer research on memory, affect, and persuasion. *Journal of Consumer Research*, **33** (June), pp. 139–149.
- John, D.R. (1999) Consumer socialization of children: a retrospective look at twenty-five years of research. *Journal of Consumer Research*, **26** (December), pp. 183–213.

- Kaikati, A. & Kaikati, J. (2004) Stealth marketing: how to reach consumers surreptitiously. *California Management Review*, **46**(4), Summer, pp. 6–22.
- Keller, K.L. & Lehmann, D. (2003) How do brands create value? *Marketing Management*, July/August, pp. 15–19.
- Kunkel, D. (1988) Children and host-selling television commercials. *Communication Research*, **15**(1), pp. 71–92.
- Larson, R. & Richards, M. (1994) *Divergent Realities: The Emotional Lives of Mothers, Fathers and Adolescents*. New York: Basic Books.
- Levin, S., Thomas, V.P. & Petrella, F.W. (1982) Preschoolers' awareness of television advertising. *Child Development*, **53** (August), pp. 933–937.
- Lindstrom, M. & Seybold, P. (2004) *BRANDchild*. London: Kogan Page.
- Livingstone, S. (2005) The effects of food advertising to children: assessing the research base. *International Journal of Advertising*, **24**(3), pp. 273–296.
- Livingstone, S. & Helsper, E.J. (2006) Does advertising literacy mediate the effects of advertising on children? A critical examination of two linked research literatures in relation to obesity and food choice. *Journal of Communication*, **56**(3), pp. 560–584.
- Luna, B., Garver, K.E., Urban, T.A., Lazar, N.A. & Sweeney, J.A. (2004) Maturation of cognitive processes from late childhood to adulthood. *Child Development*, **75**(5), pp. 1357–1372.
- Macklin, M.C. (1987) Preschoolers' understanding of the informational function of television advertising. *Journal of Consumer Research*, **14** (September), pp. 229–239.
- Maison, D., Greenwald, A.G. & Bruin, R.H. (2001) The Implicit Association Test as a measure of implicit consumer attitudes. *Polish Psychological Bulletin*, **32**(1), pp. 1–9.
- Maison, D., Greenwald, A.G. & Bruin, R.H. (2004) Predictive validity of the Implicit Association Test in studies of brands, consumer attitudes, and behavior. *Journal of Consumer Psychology*, **14**(4), pp. 405–415.
- Mallinckrodt, V. & Mizerski, R. (2007) The effects of playing an advergame on young children's perceptions, preferences, and requests. *Journal of Advertising*, **36**(2), pp. 87–100.
- Marsden, P. (2006) Introduction and summary, in Kirby, J. & Marsden, P. (eds) *Connected Marketing: The Viral Buzz and Word of Mouth Revolution*. Oxford: Elsevier, pp. xv–xxxv.
- Martin, K.D. & Smith, N.C. (2008) Commercializing social interaction: the ethics of stealth marketing. *Journal of Public Policy and Marketing*, **27**(1), pp. 45–56.
- Moore, E. (2004) Children and the changing world of advertising. *Journal of Business Ethics*, **52**(2), pp. 161–167.
- Moses, L.J. & Baldwin, D.A. (2005) What can the study of cognitive development reveal about children's ability to appreciate and cope with advertising? *Journal of Public Policy and Marketing*, **24**(2), pp. 186–201.
- Nairn, A., Ormrod, J. & Bottomley, P. (2007) *Watching, Wanting and Wellbeing: Exploring the Links. A Study of 9–13 Year Olds*. London: National Consumer Council.
- Nelson, M.R. (2005) Exploring consumer response to advergaming, in Haugtvedt, C.P. (ed.) *Online Consumer Psychology: Understanding and Influencing Consumer Behaviour in the Virtual World*. Mahwah, NJ: Lawrence Erlbaum Associates Inc., Ch. 7, pp. 167–194.

- Nolan, D. & West, C. (2004) Liberalism and mental mediation. *Journal of Value Inquiry*, **38**(2), pp. 186–202.
- Nosek, B.A., Greenwald, A.G. & Banaji, M.R. (2005) The implicit association test at age 7: a methodological and conceptual review, in Bargh, J.A. (ed.) *Automatic Processes in Social Thinking and Behavior*. New York: Psychology Press, pp. 265–292.
- Nosek, B.A., Banaji, M.R. & Greenwald, A.G. (2002) Harvesting implicit group attitudes and beliefs from a demonstration web site. *Group Dynamics*, **6**(1), pp. 101–115.
- Oates, C., Blades, M. & Gunter, B. (2001) Children and television advertising: when do they understand persuasive intent? *Journal of Consumer Behaviour*, **1**(3), pp. 238–245.
- Oates, C., Blades, M., Gunter, B. & Don, J. (2003) Children's understanding of television advertising: a qualitative approach. *Journal of Marketing Communications*, **9**(2), pp. 59–77.
- Ofcom (2006) http://www.ofcom.org.uk/consult/condocs/foodads_new/summary (accessed January 2007).
- Olsen, L. (2008) Children and dangerous advertising. *Proceedings of Child and Teen Consumption Conference*, Trondheim, 24–25 April.
- Payne, B.K. (2001) Prejudice and perception: the role of automatic and controlled processes in misperceiving a weapon. *Journal of Personality and Social Psychology*, **81**(2), pp. 181–192.
- Payne, B. (2005) Conceptualizing control in social cognition: how executive functioning modulates the expression of automatic stereotyping. *Journal of Personality and Social Psychology*, **89**(4), pp. 488–503.
- Perugini, M. (2005) Predictive models of implicit and explicit attitudes. *British Journal of Social Psychology*, **44**(1), pp. 29–45.
- Petty, R. & Wegener, D. (1999) The elaboration likelihood model: current status and controversies, in Chaiken, S. & Trope, Y. (eds) *Dual Process Theories in Social Psychology*. New York: Guilford Press, pp. 41–72.
- Phelps, E.A., O'Connor, K.J., Cunningham, W.A., Funayama, E.S., Gatenby, J.C., Gore, J.C. & Banaji, R. (2000) Performance on indirect measures of race evaluation predicts amygdala activation. *Journal of Cognitive Neuroscience*, **12**(5), pp. 729–738.
- Piaget, J. (1960) General problems of the psychological development of the child, in Tanner, J.M. & Elders, B. (eds) *Discussions on Child Development: Proceedings of the World Health Organisation Study Group on Psychological Development of the Child IV*. New York: International Universities Press.
- Plassmann, H., Ambler, T., Braeutigam, S. & Kenning, P. (2007) What can advertisers learn from neuroscience? *International Journal of Advertising*, **26**(2), pp. 151–175.
- Reeves, R. (1961) *Reality in Advertising*. New York: Knopf.
- Richeson, J.A., Baird, A.A., Gordon, H.L., Heatherton, T.F., Wyland, C.L., Trawalter, S. & Shelton, J.N. (2003) An fMRI examination of the impact of interracial contact on executive function. *Nature Neuroscience*, **6**(12), pp. 1323–1328.
- Rideout, V., Roberts, D. & Foehr, U. (2005) *Generation M: Media in the Lives of 8 to 18 Year Olds*. Kaiser Family Foundation.
- Roberts, D.F. (1982) Children and commercials: issues, evidence and interventions. *Prevention in Human Services*, **2**(1–2), pp. 19–35.

- Roberts, M. & Pettigrew, S. (2007) A thematic content analysis of children's food advertising. *International Journal of Advertising*, **26**(3), pp. 357–367.
- Roedder, D.L. (1981) Age differences in children's responses to television advertising: an information-processing approach. *Journal of Consumer Research*, **8**(2), pp. 144–153.
- Ross, R.P., Campbell, T., Wright, J.C., Huston, A.C., Rice, M.L. & Turk, P. (1984) When celebrities talk, children listen: an experimental analysis of children's responses to TV ads with celebrity endorsement. *Journal of Applied Developmental Psychology*, **5**(3), pp. 185–202.
- Rossiter, J.R. & Robertson, T.S. (1974) Children's TV commercials: testing the defenses. *Journal of Communication*, **24** (Autumn), pp. 137–144.
- Rozendaal, E., Buijzen, M. & Valkenburg, P. (2008) Comparing children's and adult's cognitive defenses to television advertising. *Proceedings of Child and Teen Consumption Conference*, Trondheim, 24–25 April.
- Rydell, R.J. & McConnell, A.R. (2006) Understanding implicit and explicit attitude change: a systems of reasoning analysis. *Journal of Personality and Social Psychology*, **91**(6), pp. 995–1008.
- Schor, J. (2004) *Born to Buy*. New York: Scribener.
- Scoccia, D. (1996) Can liberals support a ban on violent pornography? *Ethics*, **106** (July), pp. 776–799.
- Selman, R.L. (1980) *The Growth of Interpersonal Understanding*. New York: Academic Press.
- Shapiro, S. & Krishnan, H.S. (2001) Memory based measures for assessing advertising effects: a comparison of explicit and implicit memory effects. *Journal of Advertising*, **30**(3), pp. 1–13.
- Sherman, J., Gawronski, B., Gonsalkorale, K., Hugenberg, K., Allen, T.J. & Groom, C.J. (2008) The self-regulation of automatic associations and behavioral impulses. *Psychological Review*, **115**(2), pp. 314–335.
- Shiv, B. & Fedorikhin, A. (2002) Spontaneous versus controlled influences of stimulus-based affect on choice behaviour. *Organizational Behavior and Human Decision Processes*, **87**(2), pp. 342–370.
- Sloman, S.A. (1996) The empirical case for two systems of reasoning. *Psychological Bulletin*, **119**(1), pp. 3–22.
- Sowell, E.R., Delis, D. Stiles, J. & Jernigan, T.L. (2001) Improved memory functioning and frontal lobe maturation between childhood and adolescence: a structural MRI study. *Journal of the International Neuropsychological Society*, **7**(3), pp. 312–322.
- Sowell, E.R., Trauner, D.A., Gamst, A. & Jernigan, T.L. (2002) Development of cortical and subcortical brain structures in childhood and adolescence: a structural MRI study. *Developmental Medicine and Child Neurology*, **44**(1), pp. 4–16.
- Spear, P. (2000) The adolescent brain and age-related behavioural manifestations. *Neuroscience and Biobehavioral Reviews*, **24**(4), pp. 417–463.
- Sprott, D.E. (2008) The policy, consumer, and ethical dimensions of covert marketing: an introduction to the special section. *Journal of Public Policy and Marketing*, **27**(1), Spring, pp. 4–6.
- Stanley, D., Phelps, E. & Banaji, M. (2008) The neural basis of implicit attitudes. *Current Directions in Psychological Science*, **17**(2), pp. 164–170.

- Steinberg, L. (2004) Risk taking in adolescence: what changes, and why? *Annals of New York Academy of Sciences*, **1021** (June), pp. 51–58.
- Steinberg, L. (2007) Risk taking in adolescence: new perspectives from brain and behavioral science. *Current Directions in Psychological Science*, **16**(2), pp. 55–59.
- Steinberg, L. (2008) A social neuroscience perspective on adolescent risk-taking. *Developmental Review*, **28**(1), pp. 78–106.
- Steinberg, L. & Silverberg, S. (1986) The vicissitudes of autonomy in early adolescence. *Child Development*, **57**(4), pp. 841–851.
- Strack, F. & Deutsch, R. (2004) Reflective and impulsive determinants of social behavior. *Personality and Social Psychology Review*, **8**(3), pp. 220–247.
- Williams, Z. (2006) *The Commercialisation of Children*. London: Compass.
- Wilson, T.D., Lindsey, S. & Schooler, T.Y. (2000) A model of dual attitudes. *Psychological Review*, **107**(1), pp. 101–126.
- Wixted, J. (2007) Dual-process theory and signal-detection theory of recognition memory. *Psychological Review*, **114**(1), pp. 152–176.
- Wright, P., Friestad, M. & Boush, D. (2005) The development of marketplace persuasion knowledge in children, adolescents and young adults. *Journal of Public Policy and Marketing*, **24**(2), pp. 222–233.
- Yurgelun-Todd, D. (2007) Emotional and cognitive changes during adolescence. *Current Opinion in Neurobiology*, **2**, pp. 251–257.

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