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Children's ability to identify search engine advertisements in China and the UK

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ABSTRACT

Previous research about advertising effects on children has been mainly about television-based advertising, and there has been little research into the effects of web advertising to children. Only one previous study has considered the effects of search engine advertising on children. In Chapter 2, Chinese children's media use was examined using a questionnaire, in a group of 404 Chinese children aged 5 to 11 years old. Results showed that Chinese children generally showed a lack of understanding of the paid-for nature of search engine advertising. In Chapters 3 to 5, factors, including children's age and advertising culture, that affected children's ability to recognize search engine advertisements among Chinese rural children, Chinese urban children and UK children were investigated. Experimental materials included 34 invented search engine web pages in either Mandarin or English. Half the invented web pages contained text-based advertisements, and the other half contained picture-based advertisements. Children were asked to look at the search engine pages and point to where an advertisement was. Children's ability to recognize search engine advertisements increased with age, and children could recognize most of the search engine advertisements by the age of 12 years. The later development in children's ability to recognize search engine advertising compared with children's ability to recognize television advertising might due to the embedded format of search engine advertising and children's immature cognitive skills. There was no evidence to suggest picture-based advertisements were easier for Chinese children to recognize than text-based advertisements. Chinese children were better in recognizing picture-based advertisements than UK children, which might due to the pictographic nature of Chinese words. The findings of this thesis suggest that online advertisers should identify their advertisements on search engine pages more clearly, and that governments should do more to regulate online advertisements aimed at children.

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CHAPTER 1

1. LITERATURE REVIEW

Children have been targeted by marketers for decades due to their direct and indirect purchasing power (Baldassarre, Campo, & Falcone, 2016; Connor, 2006). For children themselves, they are able to build brand recognition, branded product preference, and become long term consumers (Calvert, 2008; Connor, 2006; Lapierre et al., 2017). For parents, children's aptitude, via nagging or pestering, is able to influence their parents' purchasing decisions, and indirectly allows children to join in the marketplace activities (Baldassarre, Campo, & Falcone, 2016; Lati, Hamid, Abrar, & Ali, 2017; Lawlor & Prothero, 2011). Social agents, such as parents, peers and the media, can affect children's consumer socialization (Dotson & Hyatt, 2005; Thaichon, 2017). However, the undesirable influences of the mass media have raised concerns from parents, educators and governments (Buijzen & Valkenburg, 2003a; De Jans et al., 2019; Hudders et al, 2017; Lapierre et al., 2017). Today, television has become the ideal venue for some advertisers, especially those who sell food-related products, to target the children's market because television remains the most important medium used by children worldwide (Harris & Kalnova, 2018; Li, Ye, Blades, & Oates, 2016). Factors affecting children's consumer socialization are discussed in Section 1.1.

Researchers suggest that young children are susceptible to advertising's persuasive influence as they have not developed their full cognitive abilities to help them understand that intent (Kunkel et al., 2004; Rozendaal, Buijzen, & Valkenburg, 2010). The strong impact of television advertising to children has raised increasing concerns about many issues, including children's physical health (e.g. child obesity) and personality development (e.g. materialism) (Buijzen & Valkenburg, 2003a; Kelly et al., 2010). Children's advertising literacy refers to children's advertising-related

knowledge and skills, such as their ability to recognize, understand and evaluate advertising (Hudders et al., 2017). Researchers have argued that children could use their advertising literacy to defend advertising effects (Brucks, Armstrong, & Goldberg, 1988; Friestad & Wright, 1994). Studies investigate children's advertising literacy and its effectiveness in helping children against advertising effects are discussed in Section 1.2.

Children's ability to recognize and understand television advertising, especially television food advertising, has been studied for decades (Butter, Popovich, Stackhouse, & Garner, 1981; De Jans et al., 2019; Kunkel, 2001; Lapierre et al., 2017). Research indicates children can differentiate television advertising from its content by the age about 5, the majority of children can identify television advertising by the age about 8, and children can reach adult-like recognition of television advertising by the age about 10 (Butter et al., 1981; Levin, Petros, & Petrella, 1982; Rozendaal, Buijzen, & Valkenburg, 2010). Although children can understand intents of television advertising by the age of about 12, they still have not reached the adult-like understanding of the persuasive intent of advertising (Gunter, Oates, & Blades, 2005; Rozendaal, Buijzen, & Valkenburg, 2010). Studies into children's awareness of television advertising are discussed in Section 1.3, and theories that apply to children's awareness of advertising are discussed in Section 1.4.

Besides traditional advertising, marketers attempt to target children with non-traditional advertising, including advergames and web advertising (De Jans et al., 2019; Moore, 2004; van Reijmersdal et al., 2017). One distinct feature of non-traditional advertising comparing with traditional advertising (e.g. television advertising) is its covert and interactive format (An, Jin, & Park, 2014; De Jans et al., 2019; Li, Pickering, Blades, & Oates, 2014). As more and younger children start to go online today (Brown et al, 2011; Holloway, Green, & Livingstone, 2013; Kostyrka-Allchorne, Cooper, &

Simpson, 2017), the association between child obesity and their exposure to online food advertising has raised concerns (Boyland & Walen, 2015; Mazur et al., 2018; Norman et al., 2018). The effects of Internet advertising on children have been noted by some researchers and some efforts have been made to protect children from the inappropriate online contents, which are discussed in Section 1.5.

The majority of previous research into children's recognition of advertising has focused on children's recognition of television advertising (Blosser & Robert, 1985; Butter et al., 1981; Levin, Petros, & Petrella, 1982). Today's children are enthusiastic for the new media, such as the Internet (Common Sense Media, 2017; CNNIC, 2018; Ofcom, 2017, 2018a), and advertisers expand their market by adopting non-traditional advertising delivered by new media. Some researchers have studied children's recognition of several typical non-traditional advertising, such as advergames (An, Jin, & Park, 2014), web advertising (Ali, Blades, Oates, & Blumberg, 2009; Li et al., 2014), and search engine advertising (Li et al., 2014). Research indicates that non-traditional advertising is often embedded in its editorial content, which might increase the difficulty for children recognizing the non-traditional advertising (An, Jin, & Park, 2014; De Jans et al., 2019; Li et al., 2014). Children's recognition of typical non-traditional advertisements are discussed in Section 1.6.

This thesis will focus on advertising issues in China. Most empirical investigations on children's media exposure, recognition and understanding of advertising are based on Western research. There are not many similar studies in China, a country with a large child population (China Statistic Press, 2018). A series of birth control policies has been promoted since 1979, including the one-child-policy (1979-2015) and the two-children-policy (2016-present) to limit the growth of China's population (Feng, Gu, & Cai, 2016; Zhang, 2017). Such birth control policies have made children to become the 'little emperors', and to hold great purchasing power and decisive influences in household

purchases (McNeal & Yeh, 1997; McNeal & Zhang, 2000; Ying, 2003). Factors affect Chinese children's consumer socialization are discussed in Section 1.7, China's media and advertising developments are discussed in Section 1.8.

1.1 Factors affecting children's consumer socialization

Children are able to learn consumer-related attitudes, knowledge and skills from different social agents, such as their parents, peers and the media (De Jans et al., 2019; Dotson & Hyatt, 2005; Mikeska, Harrison, & Calson, 2017). Characteristics of being a consumer include feeling needs and preference at first, making a choice and purchase to fulfil the needs and preferences, and finally evaluating the product and its alternatives (Valkenburg & Cantor, 2001).

Through a cognitive-developmental process, children gradually learn about consumer behaviour via interacting with social agents, including their families, peers and the mass media (Dotson & Hyatt, 2005; Mikeska, Harrison, & Calson, 2017). There are two learning processes in children's developing consumer socialization (Ward, 1974). One refers to learning and acquiring skills and knowledge related to consumption, and the other refers to learning and obtaining attitudes and social motivations that drive the consumer behaviour, which learning process involves a series of qualitative changes which occur as children master their cognitive abilities and adjust to their environment (Ward, 1974).

1.1.1 Effects of family and peer on children's consumer socialization

Families, especially parents, have the most pervasive influence on children's acquisition of consumer skills, attitude and knowledge in early childhood via communication and co-shopping behaviours (Chan & McNeal 2003a; Kim, Lee, &

Tomiuk, 2009; Kim, Yang, & Lee, 2015; Mikeska, Harrison, & Calson, 2017). Kim, Lee and Tomiuk (2009) examined how the parent-child communication affects children's consumer socialization, specifically their purchase decision-making styles and their influence on family purchase decisions. Kim et al found that only mother-child communication, not father-child communication, affected children's purchase decision making styles and family purchases.

Among family members, the mother has been identified as the main social agent to influence children's materialism and consumer socialization, and mother's parenting style, social status, economic status and education level are all important (Lee & Beatty, 2002; Neeley & Coffey, 2007). A father's impact on children's consumer socialization has been found to be limited as the father is less likely to be involved in the co-shopping behaviours (Neeley & Coffey, 2007). Siblings, who have pronounced influence on children's social, emotional and cognitive development, have been reported to affect children's consumer socialization (Kerrane, Bettany, & Kerrane, 2015; Kerrane, Hogg, & Bettany, 2012; Tinson & Nuttall, 2007). For example, children are able to strengthen their purchase requests to their parents via sibling coalition (Kerrane, Bettany, & Kerrane, 2015; Kerrane, Hogg, & Bettany, 2012), and learn the consumer skills via borrowing and sharing with siblings (Tinson & Nuttall, 2007).

Peers are children of a similar age and a similar cognitive developmental stage, they can increasingly influence the consumer socialization process with age through social interaction, modelling and reinforcement as parental influence decreases (Dotson & Hyatt, 2005; Thomson & Laing, 2003; Ward, 1974). As social media are prevalent among today's children, virtual peers, those peers who children meet online, play a similar role as face to face friends in affecting children's consumer socialization process (Niu, 2013; Wang, Yu, & Wei, 2012).

1.1.2 The effect of media on children's consumer socialization

As mass media are so deeply embedded in children's lives, media have become an influential factor for children, and marketers have adopted multi-types of media to saturate their advertising into children's daily life (De Jans et al., 2019; Lati et al., 2017). Advertising, as a critical part of the media influence in children's consumer socialization, promotes and sells products and services by describing the functions and identity of the products (Carlson & Clarke, 2014; De Jans, et al., 2019). Researchers have suggested that advertising might influence children's consumer socialization differently at different stage of children's development based on age (John, 1999; Valkenburg & Cantor, 2001).

Young children have been regarded as more vulnerable to persuasive messages because they lack necessary cognitive skills to fully understand advertising (Kunkel et al., 2004). After commercial exposures, children can easily have a desire to purchase advertised products, and such desire and purchase requests might lead to materialism and parent-child conflict (Buijzen & Valkenburg, 2003a; Opree, Buijzen, van Reijmersdal, & Valkenburg, 2014; Pine, Wilson, & Nash, 2007). Neural imaging research indicated that there was a lack of activation of children's pre-frontal cortex, the area of brain controlling for impulse inhibition and decision making in response to outside stimuli, compared to adults (van Meer et al., 2015).

Media have long-term effect on children's consumer socialization development (De Jans et al., 2019; Dotson & Hyatt, 2005; Gregory, Okeke, & Ezeh, 2017). Television, as the prevailing medium in the world, has been found to be embedded in children's daily life (CNNIC, 2018; Common Sense Media, 2017; Ofcom, 2017, 2018a). For example, in the UK, the Office of Communications (Ofcom) has conducted an annual survey about children and parents' media use and attitudes since 2006. According to

the latest Ofcom 2018 report, 96% of UK children aged 3 to 4 year olds watch television for about 14 hours a week, 97% of 5 to 7 year olds, 94% of 8 to 11 year olds and 90% of 12 to 15 year olds watch television for about 13 hours a week. In the US, there has been a similar national survey about 0 to 8 years old children's media use (Common Sense Media, 2017). The latest 2017 report shows that children under 2 years old spend about 30 minutes watching television per day, 2 to 8 year old children spend just over an hour watching television per day.

Due to television's dominant position, most of the findings on children's consumer behaviours rely on television advertising research (De Jans et al., 2019; Gregory, Okeke, & Ezeh, 2017). Television advertising can deliver persuasive messages to children and induce them to make purchase requests, establish brand and product preferences (Calvert, 2008; Connor, 2006; Lapierre et al., 2017). The majority of television advertising targeting children is for food and drink products, and most of these are unhealthy ones (Dalton et al., 2017; Kelly et al., 2010; Li et al., 2016). In the US, McDonald's was the leading fast-food brand, accounting for nearly 70% of television children-targeted fast-food commercials (Bernhardt et al., 2013). According to the latest Quick Service Restaurants Top 50 (QSR 50, 2018), McDonald's made 374.81 billion dollars in its 2017 US sales, followed by Starbucks (131.68 billion dollars), Subway (108.00 billion dollars). In the UK, over 1.43 billion pounds had been put into advertising each year by the top 18 fast-food brands, and McDonald's still remains as the top brand, which spent 0.85 billion pounds in its advertising (The Grocer, 2017). Dalton et al (2017) investigated the relationship between the exposure of child-targeted fast-food television advertising and pre-school children's fast-food intake. Dalton et al found that the exposure of children-targeted fast-food television advertising was positively associated with pre-school children's fast-food consumption.

For parents, some might not be concerned about advertising influence on their children. Other parents might realize the negative influence of advertising, and many parents believe that more efforts should be made to reduce advertising's influence on their children. Young, de Bruin and Eagle (2003) compared parents' attitudes towards food advertising to children among Sweden, United Kingdom, and New Zealand. The majority of parents had a negative attitude towards some aspects of food advertising, such as advertising causing unhealthy eating habits, or advertising advocating food with too many additives. Young et al also found the effect of food advertising was only seen as a weak influence when asked parents' opinions about food advertising, and parents tended to hold more negative attitudes towards the food advertising when they were presented with specific concerns about food advertising. Ferguson, Muñoz and Medrano (2012) presented 3-8-year-olds with either television programmes including unhealthy fast food advertising or programmes including healthier fast food advertising. After watching both types of food advertising, children were asked to choose their favourite food. Half the parents were asked to convince their children to choose healthier food while the other half parents were asked to tell their children to choose their favourite food. Ferguson et al found that parents' interference only has a small moderating influence on children's food choice, but advertising was a significant influence on children's food preferences in the short term.

Exposure to inappropriate advertisements has been associated with children's obesity, materialistic attitudes and parent-child conflicts (Buijzen & Valkenburg, 2003a; Opree et al., 2014).

1.1.2.1 Child obesity

Child obesity is one of the most serious global issues of the 21st century, and has gained increasing attention over the past decade (Klesges, Shelton & Klesges, 1993;

Lobstein, Baur, & Uauy, 2004; Strasburger, 2011). Food advertisements have been reported to affect children's nutritional knowledge (Boyland, Kavanagh-Safran, & Halford, 2015), food preferences (Boyland & Halford, 2013), food purchasing and purchase-related behaviours (Matthes & Naderer, 2015). Exposure to unhealthy food advertisements (e.g. high-carbohydrate & high-fat) during television viewing has been associated with children's weight gain and obesity (Hu et al., 2019; Sadeghirad et al., 2016).

Some researchers find that the exposure of unhealthy food advertisements may be associated with children's obesity after comparing food advertising effects on normal children and obese children (Boyland & Halford, 2013; Halford et al., 2004, 2008). Boyland and Halford (2013) report that children's preference for unhealthy foods is enhanced after exposing unhealthy food television advertisements, particularly in overweight and obese children. Although there was no significant difference between the normal and obese children in the accuracy of recognizing the non-food advertisements, the obese children did recognize more of the food advertisements and higher in overall food intake compared with the children with normal weight (Halford et al., 2004). Halford et al also found a substantial increase in high fat and/or sweet energy-dense snack intake in both normal and obese children, and the increase extent was larger in obese children. Hence, obese children are more susceptive to food promotion than normal children (Boyland & Halford, 2013; Halford et al., 2004, 2008).

Researchers have found advergames promoting unhealthy food could influence children's food intake (Dias & Agante, 2011; Folkvord, Anschütz, & Buijzen, 2015). For example, Dias and Agante (2011) assessed children's immediate food choice and nutritional knowledge after children played the advergame, either promoting healthy food (e.g. banana & tomatoes) or less healthy food (e.g. hamburger & pizza). Results showed that children were likely to choose advertised food promoting by advergames,

and they generally had a good knowledge of food nutrition. Dias and Agante suggested that although children know what were 'good' and 'bad' foods, their knowledge could not always be applied when selecting food (Dias & Agante, 2011). Folkvord, Anschütz and Buijzen (2015) measured the eye movements between obese children and normal weight children when they played an invented advergame promoting snacks. Compared with normal weight children, obese children had a higher gaze duration to food cues when playing the advergame promoting snacks (Folkvord, Anschütz, & Buijzen, 2015). They also measured the eye movements between hungrier children and less hungry ones, and found hungrier children also had a higher gaze to food cues. This suggests that obese children and hungry children were more susceptible when exposed to food advertising (Folkvord, Anschütz, & Buijzen, 2015)

The increased rate of child obesity has also been reported in China (Song et al., 2019). The obesity prevalence among Chinese children aged 7 to 18 years old has increased from 1.1% in 1985 to 20.4% in 2014 (Song et al., 2019). Television unhealthy food advertising has been associated with the prevalence of obesity among Chinese children (Chang, Schulz, Schirato, & Hall, 2018; Zhai & Kong, 2008). Unhealthy food advertising is a large proportion of Chinese television advertising (Chang et al., 2018; Li et al., 2016). For example, Li et al (2016) conducted a content analysis in China and reported that 71.9% of advertising on China Central Television (CCTV) children's channel targeted children, and over 86.2% of children-targeted advertising promoting unhealthy food. Zhai and Kong (2008) reported that over 60% of Children (3 to 17 years old) eat snacks every day, and the majority of children purchase and eat snacks without considering its nutrition. Children's physiological needs (e.g. hunger & thirst), the attractive taste of snacks, and being advertised are three major motivations for children to purchase snacks (Zhai & Kong, 2008).

1.1.2.2 Promoting materialism

Previous research indicates that advertising can stimulate children's materialistic values (Buijzen & Valkenburg, 2003a; Opree et al., 2014). Studies have profiled materialistic children as ones focused on consumption, insecure and egocentric (Kasser, 2005; Opree, Buijzen, van Reijmersdal, & Valkenburg, 2011). Compared with non-materialistic children, materialistic children are more likely to experience anxiety, low self-esteem, problematic peer relationship, and low level of physical and psychological well-being (Banerjee & Dittmar, 2008; Dittmar, Bond, Hurst, & Kasser, 2014).

Younger children are susceptive to advertising's persuasive influence due to their underdeveloped cognitive skills (Kunkel et al., 2004). Research indicates younger children are harder to be distracted, harder to be gratified later, but easier to be affected by advertising and make more purchase requests than older children (Buijzen & Valkenburg, 2003a, 2003b). Therefore, skills to recognize and understand advertising are essential for children to against advertising's influence (Kunkel et al., 2004).

1.1.2.3 Parent-child conflict

Advertising has been associated with the parent-child conflict (Buijzen & Valkenburg, 2003a, 2003b, 2005, 2008). Children are likely to make more purchase requests after being exposed to many advertisements, and parent-child conflict always emerges when parents refuse children's requests (Buijzen & Valkenburg, 2003a, 2003b, 2005, 2008; Goldberg & Gorn, 1978). For example, Goldberg and Gorn (1978) showed two groups of children a television programme segment with or without a toy advertisement. Children were told their mothers' preference of a tennis ball and asked to choose their preferred product from an advertised toy and a tennis ball. Children who had been exposed to the advertisement were more likely to ignore their mother's

preference and choose the advertised toy than those children who had not exposed to the advertisement (Goldberg & Gorn, 1978). In response to consumption related parent-child conflict, researchers have suggested parental mediation, such as parent-child consumption-related communication, was an important tool to undesired advertising effects to children (Buijzen & Valkenburg, 2003a, 2003b, 2005, 2008).

1.1.3 Effects of other factors on children's consumer socialization

There are other factors that also play roles in children developing their consumer behaviours, including children's age and culture (John, 1999; Lapierre & Rozendaal, 2018). Theory of consumer socialization (see Section 1.4.2), and the processing of commercial media content model (see Section 1.4.6) addressed the effect of age on children's consumer socialization.

Different countries might have different cultures, which further affect the development of consumer socialization (Hess et al., 1980; Lapierre & Rozendaal, 2018; Rose, Dalakas, & Kropp 2002). However, most previous literature about consumer socialization has been conducted in Western countries, and not many studies focus on the countries' effects in children's consumer socialization. Rose, Dalakas and Kropp (2002) examined parental age expectations, children's consumer socialization and the relationship between these two variables in five countries. Parental age expectation refers to parents' beliefs about their children's development timetable, and what a typical child should have achieved at a specific age (Hess et al., 1980). Rose at al found that American parents held an earlier developmental timetable for their children than Australian, Japanese, Greek and Indian parents. Rose et al reported that parent-child communication was associated with the early stages of their children's developmental timetables, as well as some aspects of consumer socialization, such as parental control of television watching and the frequency of the family shopping together. Lapierre and

Rozendaal (2018) compared the development of consumer socialization between children in the US and Netherlands. Mothers who had at least one child aged 5 to 12 years old were recruited online in both countries, and they were asked questions about their children's media use and consumer related behaviours. Lapierre and Rozendaal found that US children spent more time with media and owned more devices, like video game player and tablet, than their peers from the Netherlands. US children paid more attention to the social aspects of consumptions, had more purchase requests and argued more with their parents about purchasing than their Netherlands peers. These differences might be caused by differences in the advertising cultures (Hill, 2011; Lapierre & Rozendaal, 2018), by parental style (Mikeska, Harrison, & Carlson, 2017), and by the media environment, such as there are stricter regime of children-targeted advertising in the Netherlands than in the US (Hop, 2005; Kunkel & Wilcox, 2012).

In summary, children's consumer socialization development can be influenced by different social agents, such as their parents, peers and the media. Parents generally affect children's consumer socialization through communication about the consumption and co-shopping behaviours with children. Peers' influence to children's consumer socialization through social interaction and modelling, and such influence enhances with the age. Among all the social agents, the media, especially the advertising, has been reported to negatively affect children's development and caused issues, such as child obesity and parent-child conflict. Researchers have argued that children's advertising literacy might help children against advertising's effects, and children's advertising literacy development is discussed in Section 1.2.

1.2 Children's advertising literacy

Children's advertising literacy refers to children's advertising-related knowledge and skills (Hudders et al., 2017; Livingstone & Helsper, 2006; Moses & Baldwin, 2005;

Wright, Friestad, & Boush, 2005). Researchers have expressed concerns about advertising effects on children as children have not fully developed mature advertising literacy and are susceptible to advertising's persuasive influence (Kunkel et al., 2004).

Previous literature defined advertising literacy as conceptual knowledge of advertising (Livingstone & Helsper, 2006; Wright, Friestad, & Boush, 2005). Rozendaal et al (2011) proposed seven knowledge components of advertising literacy. First is the recognition of advertising, which requires ability to distinguish advertising from its content, such as television programmes, and editorial Internet content. Second is the recognition of sources of advertising, which requires understanding of who pay for advertisements. Third is the perception of intended audience, which requires understanding the concepts of 'audience targeting' and 'segmentation'. Fourth is the understanding advertising's selling intent, which requires awareness of 'selling products' is one of advertising's major purposes. Fifth is the understanding of advertising's persuasive intent, which requires awareness of advertising attempt to change consumers' behaviour via changing mental states (e.g. attitudes to the product). Sixth is the understanding advertising's persuasive tactics, which requires awareness of appealing strategies used in advertising that enhance and idealize the product. The last is the understanding of advertising's bias, which requires awareness of differentials between advertising and its advertised actual products (Rozendaal et al., 2011).

Most existing research focuses on children's recognition of advertising and understanding of advertising intents (Kunkel, 2010; Rozendaal, Buijzen, & Valkenburg, 2010). For advertising recognition, children are able to recognize television advertising by the age of 5, and reach adult-like recognition of television advertising by the age about 10 (Butter et al., 1981; Levin, Petros, & Petrella, 1982; Rozendaal, Buijzen, & Valkenburg, 2010). However, previous research investigating children's understanding of advertising intents provides inconsistent results, which might due to the different

conceptual and operational definitions of key terms (e.g. selling intent & persuasive intent). For example, 'to make people buy things' has been categorized to measure the selling intent (Blatt, Spencer, & Ward, 1972) and the persuasive intent (Carter et al., 2011). According to the seven component definitions (Rozendaal et al., 2011), advertising's selling intent changes behaviours and persuasive intent changes mental states. Hence, studies investigated children's understanding of selling intent showed that the majority of children could understand the selling intent by the age about 8 (Roberts, 1983; Wright et al., 2005). Persuasive intent has been assumed as requires more sophisticated understanding than selling intent (Oates, Blades, & Gunter, 2002; Rozendaal, Buijzen, & Valkenburg, 2010). For example, after exposure to commercial message, there were 72% of children aged 11 to 12 years old in Rozendaal et al's (2010) study, 36% of 10-year-olds and 25% of 8-year-olds in Oates et al's (2002) study could articulate advertising's persuasive intent.

Two diverging lines have been proposed in research investigating how advertising literacy helps children to defence advertising effects (Rozendaal et al., 2011). One line focuses the direct relation between advertising literacy and children's responds to advertising effects (Rossiter & Robertson, 1974; Rozendaal, Buijzen, & Valkenburg, 2009). There have been inconsistent results of this relation. For example, some research found a negative relation between children' understanding of advertising intents and their desires for the advertised products (Robertson & Rossiter, 1974; Rozendaal, Buijzen, & Valkenburg, 2009), while some others have not provided empirical evidence for the relation (Chernin, 2008; Rozendaal, Buijzen, & Valkenburg, 2009). Moreover, as the age highly correlated with children's development of advertising literacy, some researchers also investigated the relation between children's age and their cognitive defence to advertising effects. However, there was no empirical evidence supported that older children were less susceptible to advertising effects (Chernin, 2008). Another line focuses on the effectiveness of interventions aiming to enrich children's advertising-

related knowledge to reduce children's advertising susceptibility (Bruck, Armstrong, & Goldberg, 1988; Donohue, Henke, & Meyer, 1983). Based on this view, advertising literacy helps children to resist advertising effects, some Western countries make interventions, such as school-based advertising literacy programs, to improve children's ability to against advertising effects (Eagle, 2007; Gunter, Oates, & Blades, 2005). However, this line of research also showed mixed results. Some studies showed the advertising training on advertising intent and persuasive tactics helped to reduce children's desires for the advertised products (Bruck, Armstrong, & Goldberg, 1988), while some reported no significant effects of the intervention in helping children resist advertising effects (Chernin, 2008). Hence, existing empirical evidence could not convincingly support that children's advertising literacy development can reduce advertising influence to children.

Researchers suggest children's motivation and ability to process advertising messages are critical to whether children could use their advertising literacy against advertising effects (Buijzen, van Reijmersdal, & Owen, 2010; Chaiken, Liberman, & Eagly, 1989). To motivate children, children-targeted television advertising adopted emotional evocative cues, such as popular media characters (e.g. SpongeBob) (Lapierre, Vaala, & Linebarger, 2011), frenetic editing techniques, such as using sound effects (Wicks, Warren, Fosu, & Wicks, 2009), and dynamic formal features, such as highly involved natures of some advertising formats (Harris, Brownell, & Bargh, 2009).

Non-traditional advertising, such as advergames and web advertising, characteristic with embedded and interactive formats, which makes children hardly to retrieve their advertising literacy to against non-traditional advertising's effects (De Jans et al., 2019; Hudders et al., 2017; Owen, Lewis, Auty, & Buijzen, 2013). Moreover, several studies showed that children's ability to make aware of non-traditional advertising develops

later than their ability to make aware of traditional television advertising (Ali et al., 2009; An, Jin, & Park, 2014; Li et al., 2014).

In summary, children-targeted advertising strategies and children's immature cognitive ability, keep children from using their advertising literacy to against advertising effects. To provide a general picture of the relation between these two factors, children's awareness of television advertising is discussed in Section 1.3, and children's recognition of non-traditional advertising is discussed in Section 1.5.

1.3 Children's awareness of television advertising

Several developmental theories, such as the consumer socialization theory (John, 1999), and the information processing theory (Roedder, 1981), have provided insight into children's advertising literacy development.

Substantial research about children's abilities to appreciate and evaluate television advertising has been stimulated since the 1970s (Goldberg, Gorn, & Gibson, 1978; Young, 1990). Based on television-based research findings, it has been widely agreed that children's abilities to recognize, understand and cope with commercial messages are developed with increasing age, and such abilities are essential for children becoming mature consumers (Valkenburg & Cantor, 2001). A general conclusion based developmental theories indicates that children are vulnerable to advertising's effects due to their immature cognitive skills and they are able to process advertising information like adults by the age of 12 (John, 1999; Valkenburg & Cantor, 2001).

1.3.1 Ability to recognize television advertisements

One fundamental step of becoming mature consumer is to identify advertisements from its content (Kunkel, 2010; Kunkel et al., 2004). Section 1.3.1 reviews previous literature investigating children's ability to recognize television advertisements.

1.3.1.1 Shift of attention between advertisements and programmes

Attention shifts between programmes and advertisements has been regarded as the first indication that children notice advertisements (Ward, Levinson, & Wackman, 1972; Young, 1990). Older children, aged 7 to 12 years old, have shown 'dislike' reactions, such as attention decline when they saw advertisements after a programme, while the younger children, aged 5 to 7 years old, have shown comparable 'like' reactions, such as stable attention change between programmes and advertisements (Ward et al., 1972; Zuckerman, Ziegler, & Stevenson, 1978).

Young (1990) proposed stimuli-driven and schema-driven models for children's information processing. For processing the advertising information, if the viewer does not know anything about an advertisement, the stimuli-driven process is evoked, and the viewer pays attention to the unknown advertisement. If the viewer has accumulated some knowledge about the advertisements and has created a schema, the schema-driven process will be activated when encountered the advertisement again, and the viewer would able to recognize the advertisement. Young (1990) suggested children, younger than 7 years old, had relatively little advertising-related knowledge compared with older children, and they were more stimuli-driven when encountered and processed advertising information. While children, older than 7 years old, had more advertising-related knowledge as they were exposed to more advertising than younger children, and were more schema-drive when encountering and processing advertising information. However, the shift in attention could only reflect children's superficial perceptual

responses to advertisements, and could not directly represent children's awareness of the difference between advertising and programmes (Gunter, 1981).

1.3.1.2 Verbal methods and non-verbal methods

Researchers started to examine children's awareness of television advertisements using verbal or non-verbal methods in the laboratory environment in 1980s (Butter et al., 1981; Levin, Petros, & Petrella, 1982; Stutts, Vance, & Hudleson, 1981). As an example of a verbal method, researchers showed children with video segments of programmes and advertisements, then asked children to indicate which video was a programme or an advertisement verbally, such as saying 'programme' when saw programme segments (Bijmolt, Claassen, & Brus, 1998; Butter et al., 1981;Levin, Petros, & Petrella, 1982; Rozendaal, Buijzen, & Valkenburg, 2010). As an example of a non-verbal method, researchers asked children to move their hands to a particular place or objects (e.g. pictures) that they thought represented what was the advertisement (Bijmolt, Claassen, & Brus, 1998; Rozendaal, Buijzen, & Valkenburg, 2010; Stephens, Stutts, & Burdick, 1982; Stutts, Vance, & Hudleson, 1981).

Butter et al (1981) used the verbal methods to examine the abilities to distinguish television advertisements and programmes, and they found that four-fifths of children aged 5 years old could identify the presented advertisements. Bijmolt, Classen and Brus (1998) also used the verbal methods and found that about 90% of children aged 5 to 8 years old were able to distinguish advertisements and programmes. In line with previous research, Rozendaal, Buijzen and Valkenburg (2010) measured the abilities to recognize and understand advertising between children, aged 8 to 12 years old, and adults, aged 18 to 30 years old, and found that children aged 9 to 10 years old could recognize advertisements like adults.

Compared with the verbal methods, some researchers have suggested the non-verbal methods are more appropriate to assess children's recognition of advertisements as verbal tasks (e.g. open-question interview) require abstract thinking and verbalization, which might be difficult for younger children who have limited linguistic skills in understanding instructions and making articulate responses (Gunter, 1981; John, 1999; Macklin, 1987). Stephen, Stutts and Burdick (1982) adopted the non-verbal methods and asked children to move their hands to a red square of cardboard when they saw advertisements. Stephen et al suggested that although children aged 3 to 5 years old already had a high accuracy (82%) in distinguish programmes and commercials, children might distinguish programmes and commercials relied on perceptual cues rather than truly understand the difference between programmes and commercials.

Another non-verbal method refers to asking children to choose one particular picture that indicating what the advertisement wants them to do among several presented pictures (Bijmolt, Claassen, & Brus, 1998; Carter et al., 2011; Macklin, 1985, 1987). Research indicates that children could associate the advertisement with a shopping picture at about 4 to 5 years old (Bijmolt, Classen, & Burs, 1998; Carter et al., 2011).

However, some researchers have pointed out limitations to non-verbal methods, including the attractiveness of the presented pictures, inappropriate chance rates, different associations between a target picture and its linked intent of advertising (Ali, 2008). Hence, non-verbal methods may be not as valid as verbal methods to assess children's abilities to differentiate television advertisements and programmes.

1.3.1.3 Factors that affect children's television advertising recognition

Researchers have proposed several factors, such as separators and prompts, which have been found to affect children's accuracy in identifying television advertising.

Separators are shown between advertisements and programmes, and are especially designed for children to differentiate advertisements and programmes (Butter et al., 1981; Stutts, Vance, & Hudleson, 1981). For example, one separator would be shown like 'we will return to the programmes after advertisements' before advertisements shown and after programmes. Researchers have argued that separators could help children distinguish advertisements and programmes, which might have an effect on facilitating children's advertisement recognition speed for children older than 7 years, but not be helpful for younger children (Stutts, Vance, & Hudleson, 1981).

Children are assumed to use prompts, such as visual and audio cues, to differentiate between television advertising and programmes, and those prompts are characteristic features (Butter et al., 1981; Moses & Baldwin, 2005). Moses and Baldwin (2005) suggested that the characteristic features of television advertising are usually simple and perceptual so that children could notice them at the perceptual stage (3 to 7 years old). Such characteristic features are typical, but not necessary for television advertising, e.g. the length of advertising is usually short but also can be long (Cai & Zhao, 2013). Many researchers have shown children with longer programmes than advertisements (Butter et al., 1981; Gaines & Esserman, 1981). Butter et al (1981) showed children six programme segments with the length range from 1 to 2.5 minutes and four advertisements with the length of 30 seconds, and asked the children to tell experimenters when they saw advertisements. Butter et al found that 4 year old children could identify four-fifths of the advertisements, and 5 year old children could identify nearly all the advertisements. Although such a design, with different lengths of advertisement and programme segments, was realisitc, it might have allowed children to identify advertisements only based on the length of the segment. Levin, Petros and Petrella (1982) counteracted the length difference between advertisements and programmes by presenting children with the same length (10 seconds) segments of advertisements and programmes. Levin et al found that children aged 3 to 4 years old

were generally able to identify three-quarters of television advertisements, children aged 5 years old were able to identify over four-fifths of television advertisements.

In summary, children start to develop the ability to distinguish television advertisements and programmes primarily based on perceptual cues by the age about 3, children are able to identify nearly all advertisements by the age about 5, and children are able to reach adult-like recognition of advertising by the age about 10.

1.3.2 Ability to understand intents of television advertisements

Children younger than 8 years old rarely take the others' perspectives, which make them easy to be enticed by advertising (John, 1999; Kunkel et al., 2004; Moses & Baldwin, 2005). Compared with younger children, older children are able to differentiate advertisements and programmes by their defining features (Moses & Maldwin, 2005). The defining features necessary for television advertising, such as the informative, selling and persuasive intents of advertising, require advanced knowledge structure, such as the abstract thinking, that children generally acquire in the analytical stage (7 to 11 years old) (John, 1999; Moses & Baldwin, 2005).

Children aged 4 to 5 years old are unable to differentiate advertisements and programmes, and hardly to appreciate the intermission intent of advertising as they might believe advertisements referring to 'taking a break for both audience and actors' (Carter et al., 2011; Kunkel et al., 2004). Children at their 7 to 8 years old might regard advertising as a reliable source to learn whether the products are available at stores, which refers to the informative intent of advertising (John, 1999; Kunkel et al., 2004; Moses & Baldwin, 2005). Children aged 7 to 8 years old generally develop skills to take others' perspectives and appreciate the purposes of advertising is to sell the

promoted products via presentation features and qualities of the promoted products, which refers to the selling intent of advertising (John, 1999; Kunkel et al., 2004).

Children's more sophisticated understanding of advertising is to appreciate the persuasive intent of advertising, which refers to advertisers attempt to entice consumers via appealing techniques, such as overstating benefits of the promoted products (Robert, 1983; Wright, Friestad, & Boush, 2005). Moses and Baldwin (2005) suggest that the selling intent affects children's consumer behaviour directly that induce them to buy the product, while persuasive intent indirectly affect children's consumer behaviour via changing their mental state, such as increasing consumer's desires and beliefs for the product.

1.3.2.1 Ability to understand the informative intent

Researchers have adopted different methods to measure children's understanding of the informative intent of advertising, such as open-question interviews (Chan, 2000; Oates, Blades, & Gunter, 2002) and group discussions (Carter et al., 2011; Oates, Blades, Gunter, & Don, 2003). For open question individual interviews, researchers would ask children questions such as 'what do commercials try to get you to do' or 'what do you think is an advertisement?' after children exposed to television advertisements (Blosser & Roberts, 1985; Gaines & Esserman, 1981). Although the individual interview could clearly show performance and differences of children from each group, some researchers have argued that this method could lead to hesitant responses from children, especially those younger ones, and might not completely reflect children's understanding of advertising (Andronikidis & Lambranidou, 2010; Mallalieu, Palan, & Laczniak, 2005).

Some researchers have investigated children's understanding of advertising via asking children questions and letting them to discuss in small groups, which might provide more information about children's thought processes than individual interviews (Andronikidis & Lambrianidou, 2010; Carter et al., 2011; Oates, et al., 2003). Examples of group discuss questions might ask 'what are television advertisements for' and 'who do you think making the advertisement', and such questions could help researchers generate how children think and feel about advertisements (Mallalieu, Palan, & Laczniak, 2005; Oates et al., 2003). The group discussion provides an exploration of children's thought and feelings about advertisements in a broader perspective than an individual interview, and can support statistical evaluation that reflects differences between the age groups.

Researchers have concluded that children's ability to understand the informative intent of advertising is age dependent. Chan (2000) interviewed Hong Kong children and asked them open questions, such as what advertisements are, what television advertisements for and their like or dislike reasons for advertisements. Chan found 14% of 6 to 7 years old children, 53% of 7 to 8 years old children and 67% of 9 to 10 years old children showed some understanding that 'advertising is to advertise products' and 'advertising is to inform people about objects to buy' (Chan, 2000). Oates, Blades and Gunter (2002) reported that 36% of 6 year-old UK children and 44% of 8 year-old UK children were able to show comprehension of the informative function of advertising. However, researchers found that children's description of advertising as information increased with age until about 8 years old and decreased afterwards (Carter et al., 2011; Rossiter & Robertson, 1974; Ward, 1972). For example, Ward (1972) interviewed children and reported that above 30% of children aged 5 to 10 years old, but only 15 % of children aged 11 to 12 years old described the information function of advertising. Carter et al (2011) asked children to group discussed several open-questions about their thought and feelings about advertising, and found that there were 24% of children aged

4 to 5 years old, 51% of children aged 5 to 7 years old and 26% of children aged 8 to 9 years old had described the information function of advertising. There are no consistent results for when children understand the informative intent of advertising, but the generally accepted conclusion is that the proportion of children who are able to express the informative function of advertising increases from 6 to 8 years old (Blosser & Roberts, 1985; Chan, 2000; Oates, Blades, & Gunter, 2002; Ward, 1972).

1.3.2.2 Ability to understand selling and persuasive intents

Children's abilities to appreciate selling intent are required for recognizing the persuasive intent (Carter et al., 2011; Rozendaal, Buijzen, & Valkenburg, 2010; Wright, Friestad, & Boush, 2005). Carter et al (2011) investigated children's understanding of selling and persuasive intent of advertising. Carter et al found that children aged 7 to 8 years old could describe the selling intent, and the proportion increased to 90% in the 11 to 12 years old, while even the oldest age group (11 to 12 years old) only showed 40% of awareness of the persuasive intent of advertising. Rozendaal, Buijzen and Valkenburg (2010) investigated children's understanding of advertising and compared with a group of adults. After showing each advertisement fragment, participants were asked whether the advertisement wanted them buy the product (selling intent) and whether the advertisement wanted them like the product (persuasive intent). In line with previous research, Rozendaal et al found that that children showed an increasing understanding of the selling intent of advertising at about 8 years old, and the growing understanding of the persuasive intent of advertising at about 10 years old. However, Rozendaal et al also found that children were still unable to reach adult-like understanding of advertising's selling and persuasive intent even at 12 years of age, which might due to the immature cognitive abilities (Friestad & Wright, 1994; Moses & Baldwin, 2005). Hence, most children are able to understand the selling intent by the age about 8, and their ability to understand the persuasive intent was developed later at

about 12 years old. However, even at 12 years of age, children are still unable to reach adult-like understanding of selling and persuasive intents of advertising due to their underdeveloped cognitive skills.

In summary, children's awareness of advertising, including recognition and understanding of advertising, greatly develops between the age of 8 to 12. Children can reach adult-like recognition of advertising by 10 or 11 years, but even 12 year old children have not always reached an adult-like understanding of advertising.

1.4 Theories applied to the development of advertising literacy

The majority of research investigating children's advertising literacy development lacks a well-developed theoretical framework (Gunter et al., 2005). Researchers initially applied developmental theories, such as the cognitive development theory (Piaget, 1929) and the theory of consumer socialization (John, 1999), which considered the age as the only influence factor. Besides age, Roedder (1981) has considered children's information processing ability, and Valkenburg and Cantor (2001) have applied consumer socialization theory to describe children's development of advertising literacy. More recent proposed theories, such as the processing of commercial media content (PCMC) model (Buijzen et al., 2010) have integrated previous theories that apply to children's advertising literacy development and considered children's limited capacity of information processing abilities (Lang, 2000) to make a more comprehensive framework for children's processing of commercial messages. Several typical theoretical frameworks that have been applied to children's advertising literacy development are discussed in Section 1.4.

1.4.1 Piaget's cognitive development theory

Piaget's cognitive development theory, as one of the dominant paradigms to explain cognitive development, includes four stages: the sensorimotor stage (up to 2 years old), pre-operational stage (2 to 7 years old), concrete operational stage (7 to 11 years old), and formal operational stage (12 years to adulthood) (Calvert, 2008; Lawlor & Prothero, 2002; Piaget, 1929), see Figure 1.1.

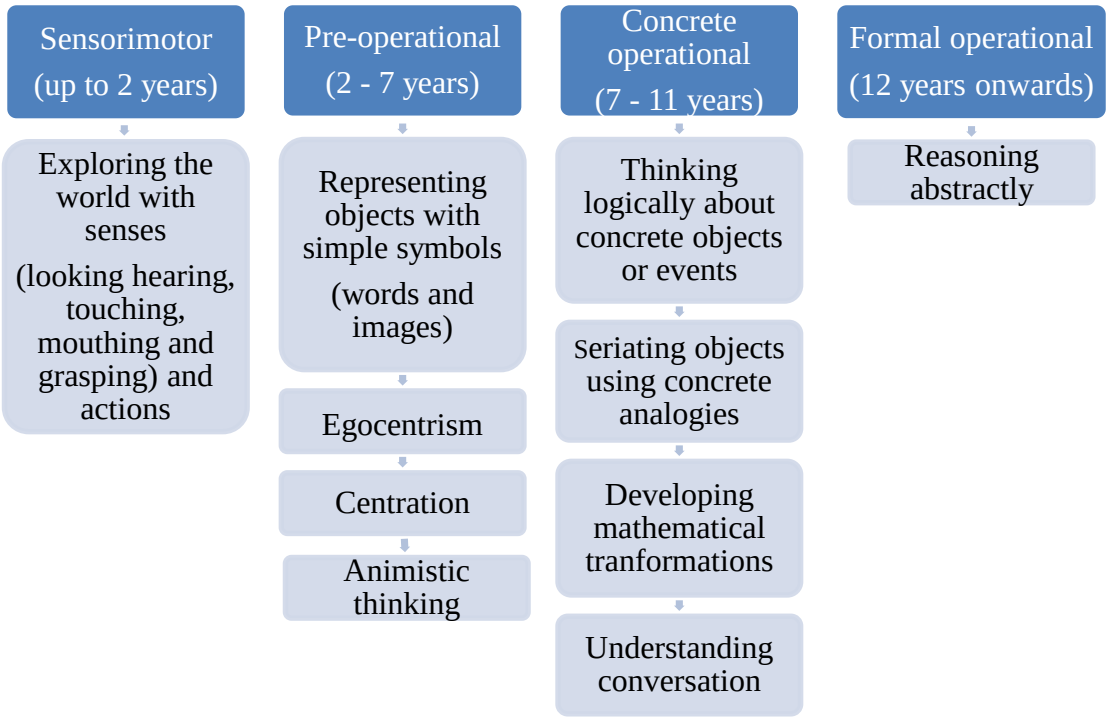

Figure 1.1 Piaget's theory of cognitive development

Source: Piaget, J. (1929). *The child's conception of the world*. London, Routldge & Kegan Paul.

In this theory, children's cognitive development is represented in four stages. At the pre-operational stage, children are egocentric, which means children fail to distinguish the perspectives of others from their own (Piaget & Inhelder, 1956). Research indicated that children had little understanding of others' perspectives, and showed little

understanding of the selling purpose of advertising (Faber, Perloff, & Hawkins, 1982). Hence, taking other people's perspectives into account is critical for children to understand the nature of advertising (Kunkel, 2001). Centration, refers to only focusing on one aspect of the task or product, such as the perceptual features of stimuli, such as its looks (Piaget, 1929; Rossiter & Roberson, 1974). Pre-operational stage children are more likely to consider television and what it delivered as a 'monolithic entity', which further make children at this stage unable to distinguish television advertising and programmes (Kunkel, 1988). Children's animistic thinking makes them believe the imaginary events and unable to distinguish the fantasy and reality.

Concrete operational stage children can think logically and go beyond the advertising information to its intents (Lawlor & Prothero, 2002). At the formal operational stage, children are able to reason abstractly and think both concretely and hypothetically. According to Piaget's theory, children have developed essential cognitive abilities to process advertising information like adults at the formal operational stage.

Piaget's cognitive development theory provides a typical agenda to understand children's cognitive development, which profoundly inspired new research and theories (Beilin, 1992; John, 1999). However, Piaget's theory cannot be directly applied to children's advertising literacy development as it explains age-related development in terms of children's performances in problem-solving tasks, while children's advertising literacy development, including recognizing and understanding advertising, does not necessarily involve the same logical reasoning process as children use in Piaget's problem-solving tasks (Gunter et al., 2005).

1.4.2 Theory of consumer socialization

John (1999) applied Piaget's theory to children's development of consumer socialization. John discerned three phrases in his theory, which was in terms of age groups, and included the perceptual stage (3 to 7 years old), the analytical stage (7 to 11 years old) and the reflective stage (11 to 16 years old). Children have shown different performance during these three stages (John, 1999; Roedder, 1981).

Children in the perceptual stage (3-7 years old) can recognize advertising only based on the perceptual features, and they often hold a positive attitude to advertising. Research suggested that children at this stage were assumed more vulnerable to advertising's effects despite the medium (Kunkel et al., 2004). During this stage, they are able to develop knowledge of advertisements, but only based on a single dimension or attribute of the advertising, such as the length of an advertisement on television or the position of an advertisement on a web page (John, 1999). Roedder (1981) suggested that although external signs (e.g. an 'ad' label) could help children tell the difference between advertising and other content, those signs would have no effect on improving their ability to understand advertising intent.

The analytical age (7-11 years old) refers to a period for children to shift from perceptual thinking to abstract thinking (Cai & Zhao, 2013). Children in the analytical age are able to notice more than one dimension of the advertising and integrate other people's perspectives (Gunter, Oates, & Blades, 2005; Roedder 1981). Although children at this stage still do not have full advertising knowledge, they start to realize the advertising intents, become cautious in their decision making process, and develop negative attitudes to advertising (John, 1999; Moore, 2004). Roedder (1981) also pointed out that the external cues are very useful not only for identifying an advertisement, but helping children to retrieve information from the advertising and promote their understanding of advertising intention.

Children in the reflective stage (11-16 years) usually have a mature understanding of advertising and are able to process advertising messages (Cai & Zhao, 2013; John, 1999). John (1999) argued that children in this stage have acquired abilities to be aware of others' perspectives and have developed mature decision making processes. Cai and Zhao (2013) also suggested that children at this stage are less vulnerable to the advertising influence. Hence, research on advertising effects for children focuses on the perceptual and analytical stages of consumer socialization.

However, as the theory of consumer socialization is based on Piaget's theory, John's theory also considers the age as the only influential factor and ignores other factors, such as media, social and family influences, which have been reported to affect children's consumer socialization (Dotson & Hyatt, 2005; Mikeska, Harrison, & Calson, 2017).

1.4.3 Information processing theory

Besides the age, Roedder (1981) suggested children's information processing abilities could work as another key element to affect children's receptivity to advertising. The information processing theory was characterized into three stages (see Figure 1.2), and depicted how children move from being unable to retrieve previously stored information to become strategic processors of information.

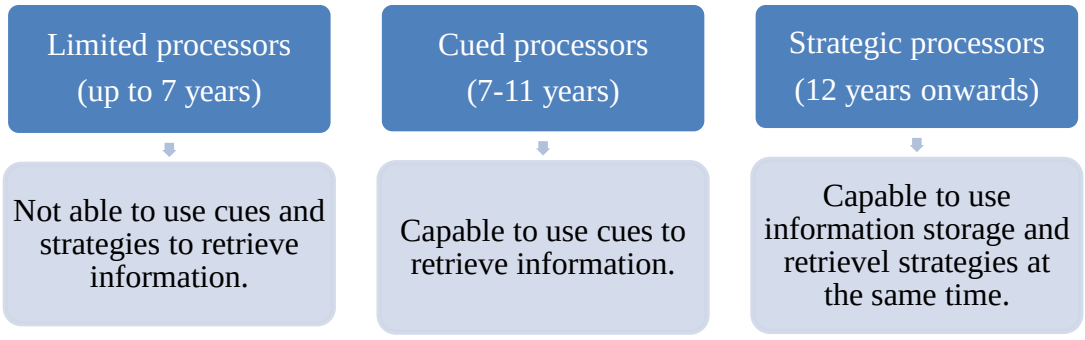

Figure 1.2 Roedder's Information processing model

Source: Roedder, D. L. (1981). Age differences in children's responses to television advertising: An information-processing approach. *Journal of Consumer Research*, *8*(2), 144-153.

Taking the central-incidental learning paradigm into account, Roedder (1981) suggested that children became increasingly capable of focusing on advertising's central message and ignoring the less relevant information. Strategic processors (older than 12 years old), are able to spontaneously distinguish the central and incidental message, and selectively process the central message. Compared with younger children, older children have stored more advertising-related information via more past advertising-related experience. Hence, older children's evaluation of the product can be more effective once they retrieve related information. For cued processors (7 to 11 years old), their immature cognitive abilities make them unable to distinguish the central and incidental messages, store product-related information and retrieve stored product-related information by themselves without instructions or cues. Hence, Roedder (1981) suggested that distinctive perceptual cues for central message, such as spatially separate from incidental message, would effectively trigger cued processors' storing and retrieving process. For limited processors (up to 7 years old), cues could not help them to distinguish the central and incidental message, and they could not select the central message, from a great amount of incidental information, to store and retrieve the product information.

In accordance with Roedder's (1981) information processing theory, Brucks, Armstrong and Goldberg (1988) found that instructions were helpful to children aged 9 to 10 years old to effectively evaluate advertising, and children were able to spontaneously evaluate advertising by the age of 13. Hence, cues or stimuli to trigger children's store and retrieve information ability are important for young children to

understand advertising intents (Bijmolt, Claassen, & Brus, 1998; Wright, Friestad, & Boush, 2005).

However, the information processing theory also paid less attention to other factors that may affect children's understanding of advertising. For example, the question format and question difficulty affect children's accuracy of response (Bijmolt, Claassen, & Brus, 1998; Blatt, Spencer, & Ward, 1972; Waterman, Blades, & Spencer, 2001). Bijmolt, Claassen and Brus (1998) presented children with pictures and asked them to choose the one that expressed advertising's intent. They found that most children aged 5 to 8 years old only showed some understanding of the advertising in the verbal task, but not in the pictorial task, which might be due to their underdeveloped abilities to store and retrieve information. They suggested that non-verbal measures might require a higher level of understanding than verbal measures. Research indicates that children younger than 8 years are unsure about advertising concepts and sometimes poor at distinguishing the advertising and programmes (Blatt, Spencer, & Ward, 1972).

1.4.4 Theory of consumer development

Valkenburg and Cantor (2001) presented a descriptive model of consumer development, which depicted different characteristics of consumer behaviour developed in terms of age (see Figure 1.3).

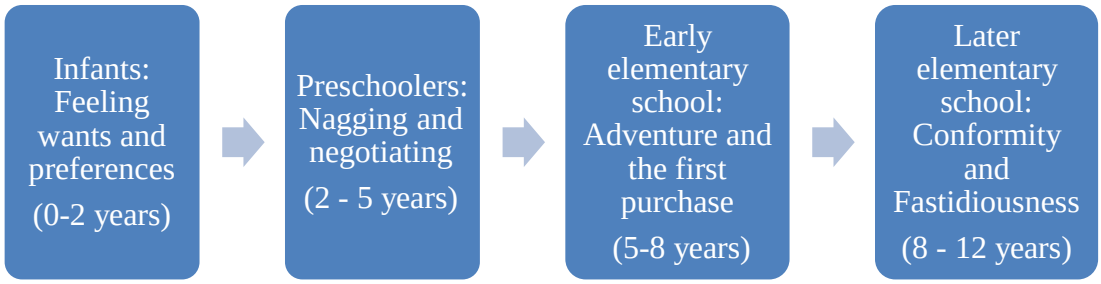

Figure 1.3 The development model of being a consumer

Source: Valkenburg, P. M., & Cantor, J. (2001). The development of a child into a consumer. *Journal of Applied Developmental Psychology*, *22*(1), 61-72.

At the infant stage (0-2 years old), children show interest in anything with bright colours and fantasy figures, such as television commercials, programmes and product packages (McNeal, 1992; Valkenburg & Cantor, 2001). Children are able to make connections between television advertised products and the products in the store, and express their wants to their parents by the age of 2 year-old (McNeal, 1992; Valkenburg, 1999).

At the pre-schooler stage (2-5 years old), children show several features in the process of being a mature consumer. First, children are unable to distinguish the difference between fantasy and reality (Goldstein & Bloom, 2015; Jaglom & Gardner, 1981). For example, children aged 2 to 3 years old were observed to clean up the egg after they saw it broke on the television (Jaglom & Gardner, 1981). Children aged 3 to 4 years could not tell what the actor experienced in programmes did not happen to the actor in reality (Goldstein & Bloom, 2015). As the television appears 'real' for children, its effect to children might be greater than it appears unreal (Krcmar & Cingel, 2019; Radesky, Schumacher, & Zuckerman, 2015). Second, their immature cognitive capacity extends their time to interpret and process the information from television images

(Valkenburg & Cantor, 2001). Third, unlike mature consumers, children at this stage are more likely to focus on the striking feature and ignore the less striking ones of an object, such as details and quality (Acuff & Reiher, 1997). For example, one study showed that most 5-year-old girls preferred to play with a cheap doll with a big sequined heart instead of two expensive dolls with senior functions (Acuff & Reiher, 1997). Fourth, preschool children could persist to tempting products, even adults taught them distractive strategies, such as covering eyes (Metcalfe & Mischel, 1999; Valkenburg, 1999). Valkenburg (1999) conducted a survey among parents about their co-shopping experience with their young children, and found that the year of 5 is a dividing point. Before the year of 5, the percentage of parents who experienced the child nagging about products in the store was rapidly increased with their child's age, while the percentage of parent-child conflicts decreased after the year of 5 (Valkenburg, 1999). One possible reason is the development of negotiation strategies of children (Arcaro-McPhee, Doppler, & Harkins, 2002; Haselhoff, Faupel, & Holzmüller, 2014).

At the early elementary school stage (5–8 years old), there are many major changes in children's development. Firstly, children are able to gradually realize the difference between fantasy and reality, but still not fully understand what looks real on television might not be real in the reality (Howard, 1998; Valkenburg & Cantor, 2001; Wright, Huston, Reitz, & Piemyat, 1994). For example, children still could not realize the character's families in television programmes are not the actor's families in reality (Howard, 1998). Secondly, children at this stage have a larger span of attention than younger age children (Ruff & Lawson, 1990). Thirdly, children in this age range prefer higher complexity of their fantasy play, such as games with adventurous themes and fast-paced entertainment (Valkenburg & Hellendoorn, 1992). Fourthly, unlike younger children who make purchases with parental accompaniment (McNeal, 1992), children between the age of 5 to 7 years old are more likely to make independent purchases (Valkenburg, 1999).

At the later elementary school stage (8–12 years old), children become more like mature consumers, paying attention to details and quality of products (Valkenburg & Cantor, 2001), and preferring fantasies with realistic themes (e.g. attached to real-life heroes) (Acuff & Reiher, 1997). Children at this stage also develop abilities to perceive others' emotion using visible cues, such as facial expressions (Vicari et al., 2000). At this stage, children develop essential skills to be critical about the commercial message and peer interactions also work as filters to resist the other agents' effects (e.g. advertising) of consumer socialization (Buijzen & Valkenburg, 2000).

Valkenburg and Cantor (2001) summarized that children's consumer socialization might vary in development due to their internal features, such as tastes and entertainment preferences, and external environmental forces, including peer pressure and commercial media.

1.4.5 Limited capacity model of mediated message processing

Lang and colleagues introduce the limited capacity model of mediated message processing (LCMP), which demonstrates relations among message, resource allocation and cognitive elaboration (see Figure 1.4) (Lang, 2000). The LCMP indicates that people are information processors and their ability to process the information is limited (Kahneman, 1973). People's cognitive resources exist within a fixed size, which relates to limitations in working memory processes (Bjorklund & Harnishfeger, 1990; Schneider & Shiffrin, 1977).

According to the LCMP, the information processing includes three stages, encoding, storage and retrieval. In the first stage, encoding after the recipient is exposed to the message, the message information will be gathered via sensory receptors, such as eyes

and ears (Eysenck, 2001), and shortly enter the sensory stores, such as visual and auditory store (Coltheart, 1980), and to be selected via both automatic and controlled selection processes. For example, if you decide to find the red shirt people in a movie, the red colour would always be prior selected during the watching, which refers to the controlled selection processes reflecting the viewer's goals. Automatic selection processes can be activated by stimuli, which relate to the viewer's goals, or stimulus characteristics. For example, selection criteria of novelty vary from culture to culture and individual to individual. The second stage, storage, refers to a continuing process from poorly stored to thoroughly stored. The poorly stored and thoroughly stored refer to a few to many associations and links between newly encoded information and previously encoded information. The last stage, retrieval, refers to the process of searching associative stored information for a specific information, relating to the exposed message, and reactivating the associative memory (Lang, 2000).

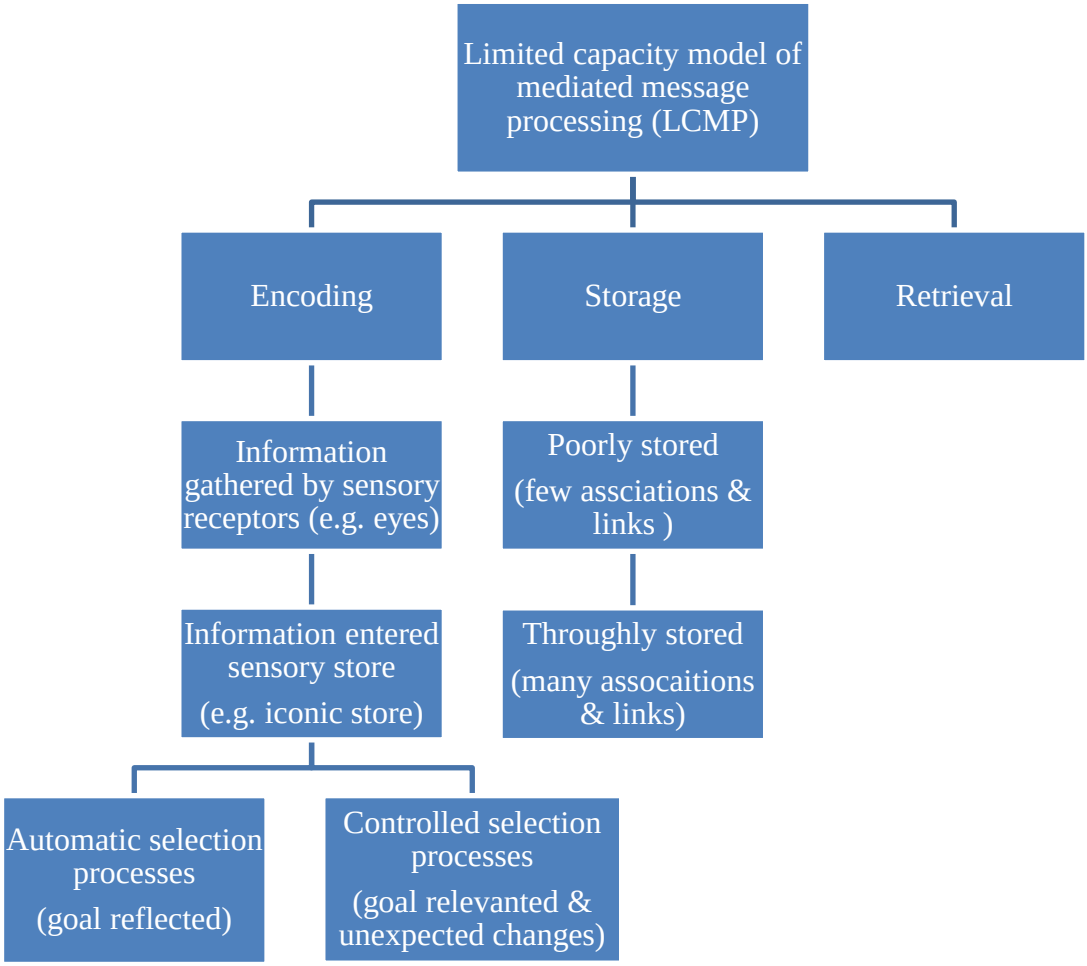

Figure 1.4 Lang's limited capacity model of mediated message processing

Source: Lang, A. (2000). The limited capacity model of mediated message processing. *Journal of Communication*, *50*(1), 46-70.

According to the LCMP, there are two determinate factors affecting how thoroughly the information is processed. The resources allocated (RA) refers to people's mental resources, and resources required (RR) depends on the message, such as its complexity (Lang, 2000). The LCMP suggested that the unbalance between RA and RR could cause the incomplete process of the message. As LCMP has been adopted by Buijzen, van Reijmersdal and Owen's PCMC model, and the unbalanced relationship between RA and RR are discussed in Section 1.4.6 (see Table 1.1).

1.4.6 Processing of commercial media content model

Before the PCMC model established (Buijzen, et al., 2010), researchers took two approaches to describe how children process commercial information. First, some researchers applied the adult persuasion model to children's persuasion processing, such as the theory of consumer development (Valkenburg & Cantor, 2001). Second, some researchers adopted developmental theories, such as theory of consumer socialization (John, 1999), which only took the age as the only influential factor. The PCMC model discerned three persuasion processes of cognitive elaboration for children to process advertising information (see Figure 1.5). Cognitive elaboration refers to the level of recipients' attention, awareness and abilities to process the advertising information (Chartrand, 2005; Petty, Cacioppo, Strathmann, & Priester, 2005).

The conditions to trigger the systematic processing require a high level of cognitive elaboration (Buijzen, et al., 2010; Heath, 2000; Petty et al., 2005). Buijzen et al (2010) distinguishes two levels of systematic processing, including the critical systematic processing, requiring the most elaborate level, and the non-critical systematic processing, requiring a less elaborate level (see Figure 1.5). Recipients who have an awareness of the persuasive intent are able to apply their advertising-related knowledge actively in the critical systematic process. Recipients have an awareness of the message or brand only actively the non-critical systematic process (Boush, Friestad, & Rose, 1994; Buijzen, et al., 2010). The systematic processing requires advanced retrieval abilities to the stored information related to the advertised product or brand (Petty et al., 2005).

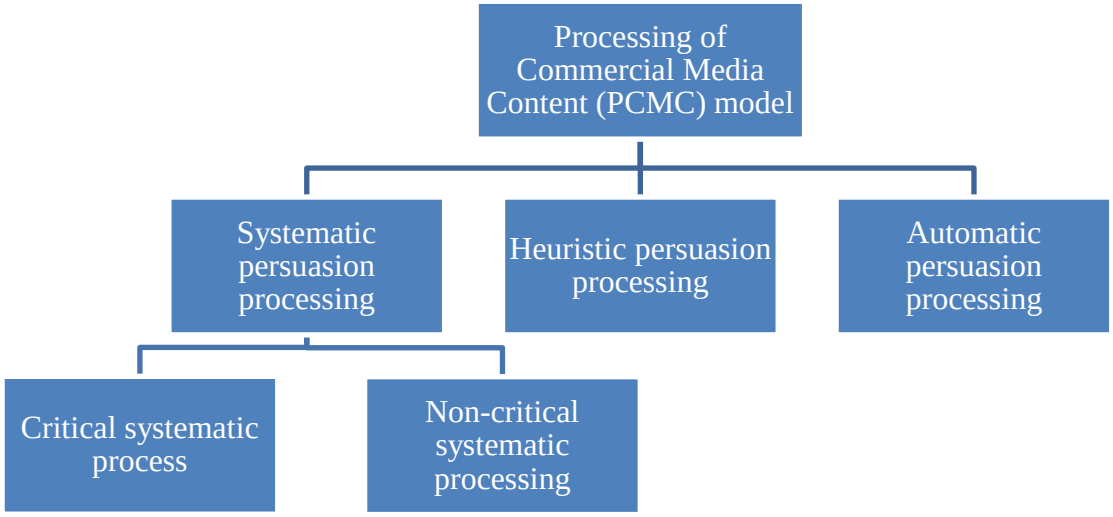

Figure 1.5 Buijzen et al's processing of commercial media content model

Source: Buijzen, M., van Reijmersdal, E. A., & Owen, L. H. (2010). Introducing the PCMC model: An investigative framework for young people's processing of commercialized media content. *Communication Theory*, *20*(4), 427-450.

Compared with the systematic processing, the heuristic persuasion processing requires a moderate to low level of cognitive elaboration (Livingstone & Helsper, 2006). In this process, recipients take a relatively simple way to evaluate the product or brand, such as high price implies better quality (Gigerenzer, 2008). Current marketing adopts emotion and entertainment based strategies to target children as children are more likely to evaluate the product or brand via heuristic persuasion processing (Heath, 2009; Nairn & Fine, 2008).

The automatic persuasion processing requires a minimal level of cognitive elaboration (Chartrand, 2005; Grimes & Kitchen, 2007). In this case, the recipients might change their attitudes and have no awareness of being influenced by advertising message. The automatic persuasion processing can be evoked by implicit brand or product memory as the advertising message has been highly embedded in its content,

such as movies, games and websites (Buijzen, et al., 2010; Ali et al., 2009; An, Jin, & Park, 2014; Li et al., 2014).

The PCMC model can be explained from a developmental perspective and involves four phases, early childhood (up to 5 years old), middle childhood (6 to 9 years old), later childhood (10 to 12 years old) and adolescence (13 years onwards) (Buijzen et al., 2010; Rozendaal, Buijzen, & Valkenburg, 2011).

In early childhood (up to 5 years old), children's immature cognitive skills made them unable to take a perspective other than their own, and are unaware of advertisers' intentions (John, 1999; Moses & Baldwin, 2005). Young children's underdeveloped cognitive skills, such as explicit memory storage and retrieval, prevented them to process the advertising message elaborately based on their stored advertising-related information (John, 1999; Roedder, 1981). Children in this phase are mainly affected by the automatic processing due to their immature cognitive development. Research indicated that children were able to make connections between television advertised products and the products in the store, and expressed their wants to parents by the age of 2 year-old (McNeal, 1992; Valkenburg, 1999). Children at this phrase were able to generate positive attitudes to the advertised product or brand if exposure to positive stimuli, like attractive animated characters (Moore & Rideout, 2007). As discussed in Section 1.3.2, empirical evidence indicated that children could recognize advertising based on perceptual features by the age of 5 (Butter et al., 1981; Stephens, Stutts, & Burdick, 1982).

During the middle childhood (6 to 9 years old), children gradually develop skills to taking other's perspective into account, and are increasingly able to understand advertising's selling intent (Wilson & Weiss, 1992). Related empirical evidence showed that most children were able to understand the selling intent of advertising by the age

of 8 (Wilson & Weiss, 1992). In this phase, children's information-processing skills are still underdeveloped, which limit children's ability to retrieve previous advertising-related knowledge to mitigate against its persuasive effects (Roedder, 1981). Children in middle childhood are mainly affected by the heuristic processing evoked by heuristic cues (e.g. preferred television characters) (Buijzen, et al., 2010; Calvert, 2008).

In the later childhood (10 to 12 years old), children are able to thinking logically and abstractly, and see objects or tasks from a broader multi-dimensional perspective (Buijzen, et al., 2010). Children in this phase are able to systematically evaluate the advertised products and brands from different aspects (Valkenburg & Cantor, 2000). During this period, children are able to consider other people's perspective simultaneously with their own. Empirical evidence showed that children were able to appreciate the persuasive intent of advertising until the age of 10 (Andronikidis & Lambranidou, 2010; Kundel, 2010; Rozendaal et al., 2011). With the development of cognitive skills as they grow up, children in the later childhood are capable of systematic processing (Buijzen, et al., 2010), and increasingly susceptible to heuristic cues due to the increasing peer influence through self-presentation and conformity to peer groups (Achenreiner & John, 2003; Livingstone & Helsper, 2006).

During adolescence (13 years onwards), children are supposed to process the persuasive information like adults at the most elaborate level (John, 1999; Pechmann, Levine, Loughlin, & Leslie, 2005). The development of their reasoning skills make children in this period able to see the world more skeptically, and are capable to critically process the persuasive information systematically (Steinberg, 2004).

Buijzen et al (2010) addressed the importance of balancing of resources allocated (RA) and resources required (RR), which came from Lang's (2000) LCMP model. As mentioned in Section 1.4.5, in the progress of message processing, the recipient assigns

an amount of resources to understand the message refers to as the RA, and the amount of resources actually using to understand the message, refers to as the RR. If there are less RA than RR, the recipient could not process the message fully. If there are more RA than RR, the recipient could have more sources to process other message information (Buijzen, et al., 2010). Buijzen et al suggested applying the limited-capacity approach to the PCMC model could be used to demonstrate the processing of persuasive messages. Buijzen et al proposed the persuasive message processing includes two levels of tasks. Processing the context of the persuasive message (e.g. playing the advergame) is the primary task, and the processing of the actual persuasive message (e.g. brand placements) is the secondary task. Hence, the amount of RR for processing persuasive message, the secondary task, depends on what is left after the recipient processes the persuasive message context (RA/RR), the primary task. Hence, there are four situations after weighting the resources allocated for the context (RAC) and resource required for the context (RRC), see Table 1.1.

Table 1.1 Four processing situations determined by the ratio between the resources allocated for the context and resource required for the context.

	Resources allocated for the context (RAC)	
Resource required for the context (RRC)	RAC low	RAC high
RRC low	1. Low elaboration of the primary task & Few resources for elaborating the secondary task	3. Moderate elaboration of the primary task & resources left to the secondary task
RRC high	2. A cognitive overload of the primary task & more resources needed for the primary task	4. High elaboration of the primary task & limited resources left to process the secondary task

Source: Buijzen, M., van Reijmersdal, E. A., & Owen, L. H. (2010). Introducing the PCMC model: An investigative framework for young people's processing of commercialized media content. *Communication Theory*, *20*(4), 427-450.

The PCMC model has been regarded as a comprehensive model applying to children's processing of commercialized media content. It suggests that different level of cognitive elaboration determines how recipients process the persuasive message systematically, heuristically or automatically (Buijzen, et al., 2010 Chartrand, 2005; Heath, 2000). The PCMC model has been applied to different types of advertising, including the traditional advertising (e.g. television advertising) and the non-traditional advertising (e.g. web advertising) (Buijzen, et al., 2010; Hudders et al., 2017; van Reijmersdal et al., 2017).

In summary, developmental theories have provided frameworks to study how children process commercial information, but some of them have limits and cannot be applied to children's awareness of non-traditional advertising (e.g. advergames & web advertising), including recognition and understanding of non-traditional advertising.

1.5 Children and Internet advertising

Children spend an increasing amount of time using the Internet mainly for studying and entertainment (Common Sense Media, 2017; Iwata, Arase, Hara, & Nishio, 2010; Ofcom 2017, 2018a). The market of children, especially those aged younger than 12 years old, are the desirable consumer group for advertisers, which also need special care as they are vulnerable to persuasive messages (Kunkel et al., 2004).

1.5.1 Patterns of children's Internet use

Due to the updated revolution in technology, today's youth have unprecedented access to both traditional (e.g. television) and new (e.g. Internet) media from a very young age (Brown, et al., 2011; Holloway, Green, & Livingstone, 2013; Kostyrka-Allchorne, Cooper, & Simpson, 2017). According to Ofcom (2018a), UK children's

online activities generally include watching television programmes via the 'over the top' services, referring to audio-visual content delivered via the Internet (e.g. Netflix), using YouTube and having a social media profile. Some of these channels (e.g. YouTube) have advertising contents.

Findings from surveys about children's media use show that children are enthusiastic about the Internet (Common Sense Media, 2017; Ofcom, 2018a). In the UK, according to the UK Ofcom (2018a) report, 52% of children aged 3 to 4 spent about 9 hours online in a week, 67% of children aged 5 to 7 years old spent nearly 10 hours online in a week, 93% of children aged 8 to 11 years old spent nearly 14 hours online in a week, and 99% of children aged 12 to 15 years old spent nearly 21 hours online in a week. In the US, the latest Media Use by Kids age 0 to 8 (Common Sense Mdia, 2017), showed that children up to 8 years old generally spent just over 2 hours using screen media in a typical day. Specifically, children younger than 2 years old spent 0.7 hours, children aged 2 to 4 years old spent about 2.7 hours and children aged 5 to 8 spent about 2.9 hours on screen media in a typical day.

1.5.2 Effects of Internet on children

Young children's immature cognitive development limit their ability to resist advertising's influence (Buijzen, et al., 2010; John, 1999; Roedder, 1981; Valkenburg & Cantor, 2000). Compared with television advertising, the format of online advertising is more embedded, which might increase the difficulty for children to recognize and understand the online advertising (Ali et al., 2009; De Jans et al., 2019; Li et al., 2014). In terms of the popularity and ubiquity of online advertising, coupled with the rapid growth of child online users, researchers have noted concerns about children's online safety and health (Kelly, Vandervijvere, Freeman, & Jenkin, 2015; Norman et al., 2018). For example, in line with television advertising effects, researchers have reported an

association between the online food advertising and children's obesity (Boyland & Whalen, 2015; Dias & Agante, 2011; Mazur et al., 2018; Norman et al., 2018).

Research indicates that exposure to online unhealthy food advertising directly causes a significant increase in children's intake of the unhealthy food (Boyland et al., 2016; Norman et al., 2018). Advergames have become one effective channel for food advertising (Dias & Agante, 2011; Norman et al., 2019). A combined stronger influence of both online advertising and television advertising that promoted the unhealthy food was reported by Norman et al (2018). Norman et al (2019) also found children with heavier weight status were more vulnerable to the unhealthy food influence than children with normal weight status, which is in line with previous television-based research findings (Folkvord, Anschütz, & Buijzen, 2015; Halford et al., 2008). Bruce et al (2013) reported that children with obesity showed a lower activation in the pre-frontal cortex, which indicated they have less control over eating impulses, and led to their vulnerability to the tempting food persuasive messages.

Research focusing on advergames effects showed that children are more likely to choose the food they have played with on advergames (Dias & Agante, 2011; Folkvord, Anschütz, Buijzen, & Valkenburg, 2012). To reverse the negative effects of advergames, Dias and Agante (2011) asked children to either play an advergame promoting healthy food, (e.g. fruits) or unhealthy food (e.g. snacks), and their results verified the promoting effects of advergames and showed the promoting effects could be applied to boost children's healthy eating. Hence, Dias and Agante suggested that educators and parents could use the digital games to promote children's healthy eating habits, and the regulations are still needed to restrict unhealthy content appearing in advergames targeted at children.

1.5.3 Internet advertising-related laws and regulations

Given children's vulnerability to advertising effects, the call for advertising regulations has been raised since the 1970s. In the US, established by the National Advertising Review Council in 1974, the Children's Advertising Review Unit (CARU), as a self-regulatory program evaluates advertising that targets children under 12 years old. In response to changes in child targeted marketing, CARU added and revised the guidelines for children's advertising to address the concerns about online targeted advertising (CARU, 2014). According to their latest version released in 2014, part one included guidelines focused on inappropriate marketing practices, such as deception and blurring of advertising content. Part two focused on children's online safety issues, such as data collection, which is consistent with the Children's Online Privacy Protection Act (COPPA) (Federal Trade Commission, 2013), which did not allow children's websites to collect personal information from children under 13 years of age. Websites should make this practice explicit, and require parents' permission to collect such information. Although Cai and Zhao (2013) found that only half of children's websites complied with the COPPA guidelines, more positively there are an increasing number of websites that label their advertisements and the efforts of several related regulations can be seen. For example, several big companies in the US were fined nearly one million dollars in total for illegally tracking children via children's websites (Brandom, 2016).

Besides the regulations, some websites make efforts to help children to identify advertisements via labelling and pop up windows in response to the increasing concern about children's well-being online (Cai & Zhao, 2010). According to the information processing theory (Roedder, 1981), children aged 7 to 11 years old, at the cued processors stage, are able to retrieve stored advertising-related knowledge as they encounter related cues (Bruck et al., 1988). Therefore, labelling becomes a beneficial

tool for those children to access previous advertising-related knowledge and resist its effects. As another more explicit tool, pop up windows or pages also work to alert children to the upcoming advertising (Cai & Zhao, 2010). Such tools help children to recognize online advertisements and decrease the likelihood of clicking on advertisements (Cai & Zhao, 2013).

Moreover, advertisers might hold similar perceptions of traditional and non-traditional advertising. Daems, Pelsmacker and Moons (2019) interviewed Belgian professional advertisers' view of the appropriateness of non-traditional advertising targeted at children. Daems et al found that advertisers would disclosure advertising aimed at 9- to 10-year-olds, and that they considered the age when it was acceptable to target children without warning was from 12 years onwards. Daems et al's results indicated advertisers considered children's awareness of advertising based on previous developmental theories, such as theory of consumer socialization (John, 1999), and on empirical evidence derived from television advertising.

In summary, the Internet not only provides children a platform for study and entertainment, but also offers advertisers a new channel to target children and affect them via non-traditional advertising. Although some regulations and websites try to help children resist the effects of non-traditional advertising, more empirical evidence of these non-traditional advertising effects on children are still needed. It is important to know when children could recognize non-traditional advertising as the prior step for further understanding and coping with non-traditional advertising. Children's recognition of three typical non-traditional advertising is discussed in Section 1.6.

1.6 Ability to recognize non-traditional advertising

Non-traditional advertising, such as advergames and web advertising, brings dramatic changes in children's digital lives and commercial environment (Ali et al., 2009; An & Stern, 2011; Evans, Wojdynski, & Grubbs, 2019; Owen et al., 2013). Compared with traditional advertising, such as television advertising, non-traditional advertising is more likely embedded in the editorial content, resulting blurred boundaries between advertising, entertainment and information (Bruce, Murthi, & Rao, 2017; Chen, Yeh, & Chang, 2018; De Jans et al., 2019).

As children are a vulnerable group for advertising messages, the new embedded format of advertising can increase the difficulty for children to recognize and understand the advertising messages (Ali et al., 2009; De Jans et al., 2019; Li et al., 2014). As a fundamental step in children's awareness of advertising, children's recognition of the non-traditional advertising has raised increasing concerns by parents, educators and governments (De Jans et al., 2019; Ofcom, 2017, 2018a).

1.6.1 Ability to recognize advergames

As commercial messages are embedded within interactive advergames, it may be hard for children to identify them (An, Jin, & Park, 2014; An & Stern, 2011; Moore & Rideout, 2007; Norman et al., 2019). An and Stern (2011) adopted advertising break as the cue to see whether it helped children, aged 8 to 11 years old, to recognize the advergames, and found the advertising break could not help children to recognize the advergames as advertising. An, Jin and Park (2014) asked children, aged 8 to 9 years old, to play an ice-cream game with advertising brands. When children were asked whether they thought the ice-cream game was a type of advertising, only a quarter of children said 'yes' (An, Jin, & Park, 2014).

Research has shown that playing advergames leads to a more positive attitude to the embedded commercial messages in the advergames and does so more effectively than traditional television advertising (Norman et al., 2019; Vanwesenbeeck, Walrave, & Ponnet, 2017). Vanwesenbeek, Walrave and Ponnet (2017) reported that children's game attitude was positively affected their attitude to the advertised brands, and children with positive game attitude were more likely to report higher purchase intentions. Norman et al (2019) examined the effects of television advertising and advergames on Australian children's recognition. They found an increase in brand recognition when children experienced both television advertising and advergames rather than just television advertising, and children who played advergames developed a more positive attitude to the brand (Norman et al., 2019). Hence, researchers have suggested that policy makers should consider additional regulations for protecting children from new marketing methods (Norman et al, 2019; Vanwesenbeeck et al., 2017).

1.6.2 Ability to recognize web advertising

As another typical type of non-traditional advertising, web advertising blurs boundaries between advertising, information and entertainment (Ali et al., 2009; Li et al., 2014). Web advertising is mainly delivered in picture-based, text-based and the picture-text-mix to embed into its web content (Gidlöf, Holmberg, & Sandberg, 2012; Hsieh & Chen, 2011). As elementary school age children still have not fully developed abilities to read and understand pure text-based messages, pictures, as an assistant tool, have been found to be more influential for children than for adults (Filippatou & Pumfrey, 1996; O'Neil, 2011).

1.6.2.1 Effects of presentation mode to children's recognition of web advertising

Presentation mode, including pictures or text, is assumed to affect the information processing, which affect pictures or text recognition in turn (Chau, Au, & Tam, 2000). Chau, Au and Tam (2000) indicated that using the picture as the presentation mode facilitates a quicker and more accurate comprehension process than using the text-based presentation mode. Research indicates that picture-based message is more attractive and supports word recognition and comprehension than text-based message for people with poorer literary skills, like children (Goodrick, 2011; Houts, Doak, Doak, & Loscalzo, 2006; Pieters & Wedel, 2004). However, children have difficulty in recognizing web advertising even when presented in pictures (Ali et al., 2009; Li et al., 2014). Processing both pictures and text information might overload children's capacity to process information (Buijzen, et al., 2010; Lang, 2000), and the similar formats of web advertising and its content confuse children and increase the difficulty for children to identify the web advertising (Ali et al., 2009; Li et al., 2014).

1.6.2.2 Effects of non-television advertising format to children's recognition of web advertising

According to the television-based advertising recognition research, younger children could use perceptual cues (e.g. separators) to distinguish the television advertising from programmes (Butter et al., 1981; Stutts, Vance, & Hudleson, 1981). However, web advertising lacks reliable characteristic cues like television advertising (e.g. shorter length of advertising than programmes) and weakens children's ability to recognize the web advertising. Research indicates children could rely on its characteristic features, such as the position and animated effects, to identify web advertising (Fielder, Gardner, Nairn, & Pitt, 2007). But these features also vary considerably and confuse children

(Cai & Zhao, 2013; Fielder et al., 2007). For example, children might recognize the non-commercial content as advertising because they thought the content was presented in a typical advertising position (Fielder et al., 2007). Children might also recognize the advertising as the non-commercial content because they thought the advertising was presented in a typical non-commercial content position (Torres & Weber, 2011).

1.6.2.3 Empirical research about children's recognition of web advertisements

In a novel study focused on when children developed abilities to recognize web advertising, Ali et al (2009) asked UK children, aged 6, 8 and 10 years old, to point out advertisements on the invented web pages (see Figure 1.6). Ali et al (2009) found that the 6-year-olds could identify less than a third of the advertisements, the 8-year-olds could identify about half, and the 10-year-olds could identify three-quarters of the web advertisements. To investigate whether there was a cultural difference affecting children's abilities to identify web advertising, Ali et al (2009) repeated the same study in Indonesia and recruited children aged 6, 8, 10 and 12 years old. The results were in line with the UK results, and the 10-year-olds and 12-year-olds were not differ significantly and they could identify about three-quarters of the advertisements.

Ali et al expected price information could work as cues helping children to recognize web advertisements, but it only worked among older children, aged 10 to 12 years. For younger children, aged 6 to 8 years old, they might lack essential literacy skills to recognize the price information (Ali et al., 2009).

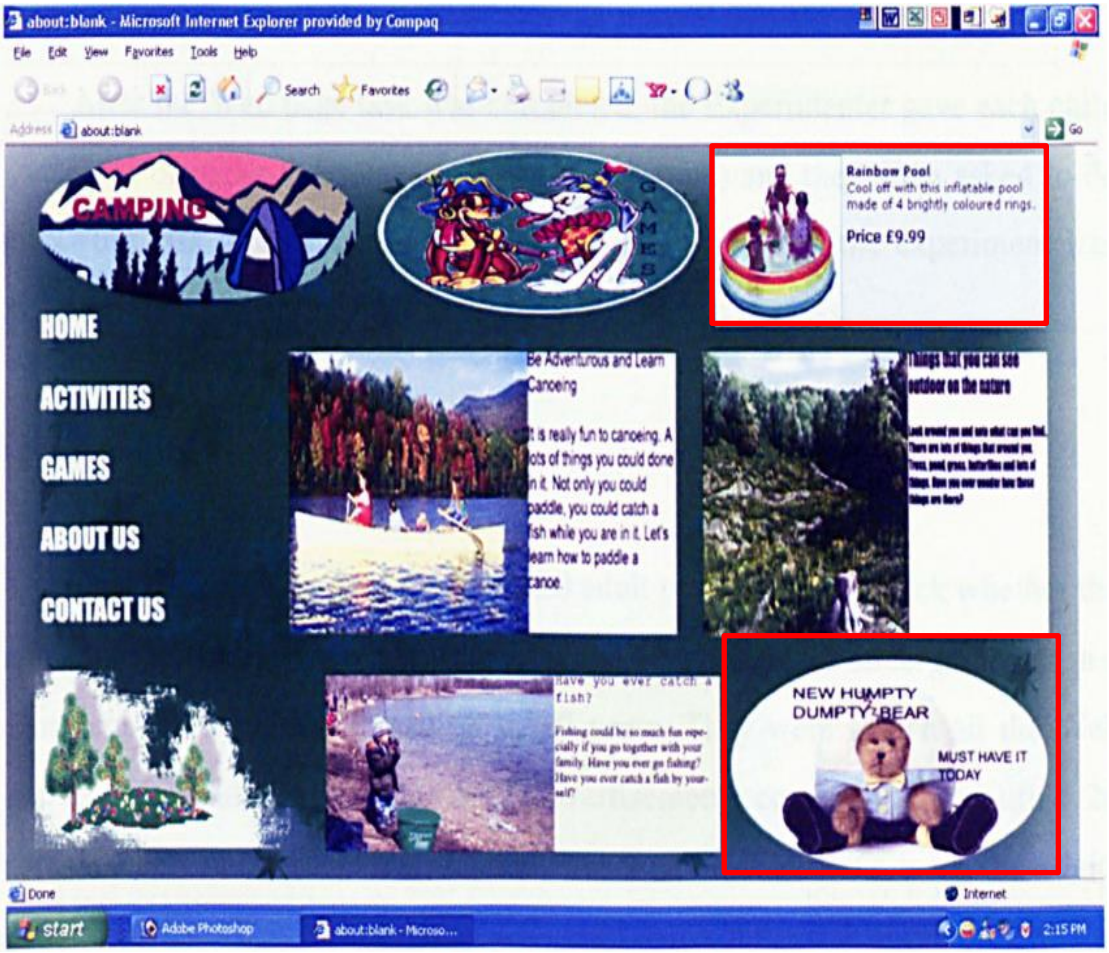

Figure 1.6 Example web page from Ali et al (2009) with two advertisements are highlighted in red squares (squares were not shown on the actual materials).

Source: Ali, M., Blades, M., Oates, C., & Blumberg, F. (2009). Young children's ability to recognize advertisements in web page designs. *British Journal of Developmental Psychology*, 27(1), 71-83.

Li et al (2014) followed up Ali et al's (2009) study, and tested 7 to 11 year old Chinese children's ability to recognize web page advertising (see Figure 1.7). They found that the 7-year-olds could identify about a half, and the 9-year-olds and 11-year-olds could identify most of the web advertisements. Li et al (2014) concluded that although Chinese children could identify most of the advertisements by the age of about 9, they still had difficulty distinguishing web advertisements from the content because 11 years old children sometimes pointed out non-advertisements as advertisements.

Figure 1.7 Example web page from Li et al (2014) with one advertisement is highlighted in a red square (the square was not shown on the actual materials).

Source: Li, S., Pickering, M., Ali, M., Blades, M., & Oates, C. (2014). Young children's ability to identify advertisements on television, web pages and search engine web pages. In: Blades M., Oates C., Blumberg F., Gunter B. (Eds). *Advertising to Children,* 199-217. London: Palgrave Macmillan.

1.6.3 Ability to recognize search engine advertisements

According to the Internet Advertising Bureau (2019) search engine advertising refers to advertisers paying online search companies to list their advertising links at domain positions when users search for a word or phrase that relates to their products. Previous research on search engine advertising has focused on its functional mechanisms and associations between its metrics, such as the pricing model for search engine advertising

(Ghose & Yang, 2009; Zenetti et al., 2014). There are four pricing models widely used in search engine advertising. The first model is the paid listing, which refers to what advertisers pay when the user clicks the text links. Those links usually appear at the top or side of the search engine web page if specific keywords or phrase was searched, and the position of advertising link is positively related to advertisers' payments. The second model is contextual search, which refers to advertisers only pay when their links are clicked. Those links usually appear in articles, based on the content's context, rather than on users' searched keywords or phrase. The third model is the paid inclusion, which refers to advertisers make payments for listing, as being indexed on search engine websites, instead of clicks. The fourth model is the site optimization, which refers to site owners paying for optimizing their sites by being better indexed on search engine result web pages.

Search engine advertising is profitable, and has been considered as one of the most effective online marketing tools (Ghose, Ipeirotis, & Li, 2014; Green, 2003). A typical search engine output page links the keyword with predefined links and subjects, and to related advertisements, similar to the unpaid search results (Zenetti, Bijmolt, Leeflang, & Klapper, 2014). Search engine advertising is more evolved than online banner and pop-up advertising and has served both consumer and sponsoring companies better (Rutz, & Trusov, 2011). It is not only able to satisfy a user's demand for relevant search results, but also provides high efficiency for advertisers to attract a potential customer's interest. In other words, search engine advertising transforms the complex and mass advertising to a much better targeted audience (Ghose & Yang, 2008).

Compared to adults, children show a completely different pattern of searching information online due to the different interesting topics and different level of computer skills and language capabilities (Kammerer & Bohnacker, 2012; Torres, Weber, & Hiemstra, 2014). However, the current search engine design is more suitable for adult

instead of children (Torres, Weber, & Hiemstra, 2014). As mentioned in Sections 1.1.2 and 1.5.2, children are assumed vulnerable to the advertising effects (Kunkel et al., 2004), researchers suggest that search engines should filter the inappropriate content (e.g. violent/pornographic information), and announce the need-to-be-notice content (e.g. web advertising) for children users (Bilal, 2002; Torres, Weber, & Hiemstra, 2014).

Children's abilities to recognize advertising is an essential step for children to understand the advertising intents (Kunkel et al., 2004). The majority of previous research has investigated children's recognition of television advertising, and few studies have focused on children's recognition of web advertising and advergames, There is only one published research investigated children's recognition of search engine advertising (Li et al., 2014). In line with Ali et al (2009), Li et al asked 8, 10 and 12 years old UK children to point out the advertisements from invented search engine web pages (see Figure 1.8).

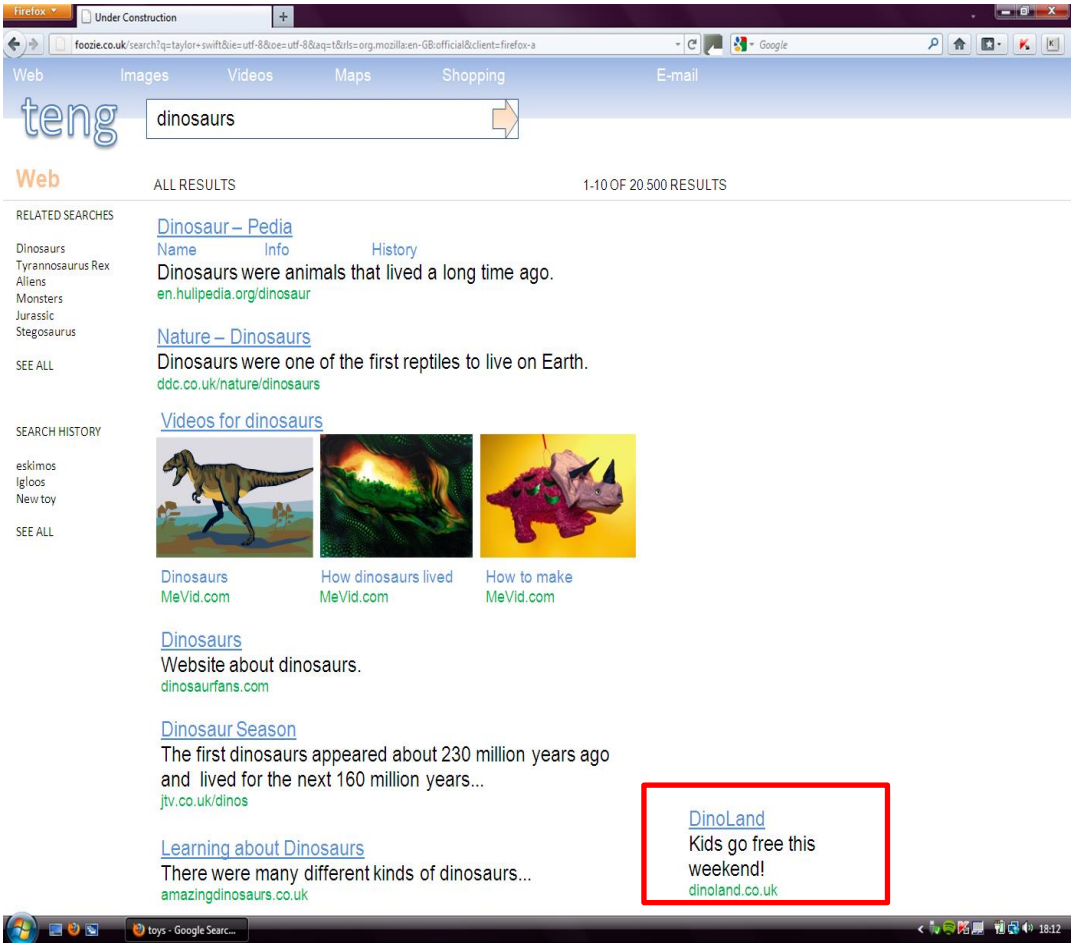

Figure 1.8 An example of a search engine results page from Li et al (2014) with one advertisement is highlighted in a red square (the square was not shown on the actual materials).

Source: Li, S., Pickering, M., Ali, M., Blades, M., & Oates, C. (2014). Young children's ability to identify advertisements on television, web pages and search engine web pages. In: Blades. M., Oates. C., Blumberg. F., Gunter. B. (Eds). *Advertising to Children,* 199-217. London: Palgrave Macmillan.

Li et al (2014) found that the 8-year-olds recognized about one-sixth, the 10-year-olds recognized about half, and the 12-year-olds recognized two-thirds of the search engine advertising. In addition, the 8 and 10-year-olds incorrectly pointed out many non-advertising content as advertising, and 12-year-olds also incorrectly pointed out a quarter of the non-advertising content as advertising. In line with web advertising recognition research, such findings indicated that children's ability to recognize the

search engine advertisements improved with age, but even at 12 years of age the children still experienced difficulty to recognize all the advertisements (Li et al., 2014).

In summary, children, even at the analytical stage (7 to 11 years old) still had difficulty in distinguishing non-traditional advertising and its content due to their limited cognitive skills and the embedded features of non-traditional advertising (Ali et al., 2009; De Jans et al., 2019; Li et al., 2014). Compared with previous television-based research findings, children could only identify web advertisements at a later age than they could identify television advertisements (Butter et al., 1981; Levin et al., 1982). The development of children's ability to web advertisements was more universal rather than specific to one culture as there were similar findings from different countries, the UK, Indonesia, and China (Ali et al., 2009; Li et al., 2014). However, there is no previous research focus on Chinese children's recognition of search engine advertising, and the current thesis aims to fill this research gap.

1.7 Factors affect Chinese children's consumer socialization

Chinese children have been regarded as 'little emperors' in their family due to China's birth control policies (Feng, Gu, & Cai, 2016), which empower their indirect and direct purchasing power (McNeal & Yeh, 1997). As mentioned in Section 1.1.1, parents play critical social agent role in affecting children's consumer socialization (Chan & McNeal, 2003a). In China, parents' attitudes to children's consumption have shown diverging trends (Ying, 2003; Zhao, 2006), which might further affect Chinese children's consumer socialization. Other factors, such as the media and textbooks, have been found to influence Chinese children's consumer socialization (Chan, 2006; Chan & McNeal, 2006b).

1.7.1 Birth control policies

China has 0.23 billion children (0 to 14 years old), accounting for 16.8% of its population, and 11.7% of the world child population (National Bureau of Statistics of China, 2018; The World Bank, 2018). To reduce the rate of population increase, the government introduced a series of birth control policies, the one-child policy (1979-2016), and the two-child policy (2016-present) (Feng, Gu, & Cai, 2016; Zhang, 2017).

China's birth control policies have empowered Chinese children's direct and indirect purchasing power (McNeal & Yeh, 1997; McNeal & Zhang, 2000; Ying, 2003). Chinese children had their income from families began at age 4, they generally saved nearly half of their income and spent the rest on purchasing snacks, toys and school-related items (McNeal & Yeh, 1997). McNeal and Zhang (2000) reported that Chinese children (4-12 years old) who lived in major cities (e.g. Beijing) had income about 11.3 billion dollars and spent over 6 billion dollars in 1999. McNeal and Zhang found that Chinese children could influence about two-thirds of their household spending and American children could only influence less than half of the spending. Compared with American parents, Chinese parents were more likely to listen to their children's opinion during shopping (McNeal & Zhang, 2000). Ying (2003) suggested that Chinese children's consumption level was high, and could equal to one-third of their family income, and their consumption categories mainly included children's food and dietary supplements, toys, electronic equipment (e.g. computer) and education-related items (e.g. practice books).

1.7.2 Chinese parents' attitude to children's consumption and advertising

Chinese parents are assumed to have diverging trends in their attitude to children's consumption (Ying, 2003; Zhao, 2006). On one hand, Chinese parents support their

children's consumption (Ying, 2003). Chinese parents tend to provide everything that they have not enjoyed in their deprived childhood, and fulfil children's purchase requests because they feel guilty for not spending enough time with their children (Zhao, 2006). On the other hand, Chinese parents hold negative attitudes to some of their children's consumption. To improve their children's competitiveness in the labour market, Chinese parents make efforts to reduce interferences in their children's studying (e.g. time spent to playing with toys). For example, they refuse to purchase new toys because playing toys can distract children's attention from studying (Chan & McNeal, 2003b; Greenberg, Li, Ku, & Wang, 1991).

Chinese parents' generally hold negative attitudes towards advertising, especially those target their children (Chan & McNeal, 2003b). Chan and McNeal (2003b) conducted a survey among parents of children aged 6 to 14 years old in mainland China, and investigated parents' attitude to advertising. From Chinese parents' perspective, advertising was deceptive, annoying and should be banned on children's programming (Chan & McNeal, 2003b).

1.7.3 Urban-rural disparity in children's consumer socialization

China has the second largest child population in the world, and nearly half of them live in the rural areas (Unicef China, 2018). Compared with some Western countries, there is a lack of research into media and advertising effects on children in China. Chinese researchers have identified urban-rural differences in in media ownership and usage (Chan & McNeal, 2006b), information sources (Chan & McNeal, 2006c, 2007), perception of advertising and brands (Chan, 2008), the influence of televising advertising on children (Chan, & Cai, 2009) and parental mediation of their children's television viewing (Sun, 2009) among Chinese children.

There are several urban-rural differences among Chinese children. First, television was regarded as the major information source for new products among urban and rural children (Chan & McNeal, 2006c, 2007). Teachers were active in informing rural children about new products, while urban children rarely asked teachers about marketplace information (Chan & McNeal, 2004a). Chan and McNeal (2007) indicated that urban children still regarded the media as a resource and had not been overwhelmed with commercial information, while authorities, such as parents and teachers, were regarded as rural children's sources provided education and information (Sun & Wu, 2004). Second, rural children paid more attention to television commercials while urban children pay more attention to new media commercials, which indicated there might be an urban-rural digital divide in China (Chan & McNeal, 2006b; Sun, 2009). Third, rural children were less sceptical to commercial message than urban children (Chan, 2008). However, as most Chinese research on urban-rural disparity in children was conducted at least 10 years ago, there is a lack of up-to-date research focus on urban-rural disparity in children. In this thesis, the Study 3 measured Chinese urban children's ability to recognize search engine advertising and compared between rural and urban Chinese children.

1.7.4 Effects of other factors on Chinese children's consumer socialization

Chan and her colleagues have conducted several research to investigate factors that affect Chinese children's consumer socialization (Chan, 2006; Chan & McNeal, 2003a, 2006a). Chan and McNeal (2003a) found that Chinese parents strictly controlled the purchase of certain types of products (e.g. toys), but gave choices for children to purchase from the permissible products (e.g. practice books).

Chan and McNeal (2006a) investigated the effects of factors, such as the age, gender, attention to television advertising, and the presence of public service advertisements,

on mainland Chinese children's consumer socialization. Compared to parental influence, Chan and McNeal found that television played a more important role that affected Chinese children's consumer socialization. Chan and McNeal suggested that children's age and the advertisement market environment were both factors in affecting children's understanding of television advertisements.

Chan (2006) also analysed the consumption values in the moral education textbooks used in the elementary schools in mainland China. Chan reported that 11% of the lessons in the textbooks were about consumption, and emphasised the importance of frugality that reflected the communist values, which contrast with the consumption values of commercials promoting capitalistic values of fun, uniqueness and enjoyment (Chan, 2006).

In summary, China's unique social-political environment influence parents' attitude to their children's consumption, children-targeted advertising, and children's consumer socialization. As the media greatly affect children's consumer socialization, media and advertising development in China are discussed in Section 1.8.

1.8 Media and advertising development in China

As this thesis focuses on advertising issues in China, Section 1.8 aims to provide a general background by introducing media and advertising development in China, advertising-related laws and regulations in China, and Chinese children's media use.

1.8.1 Media development in China

As discussed in Section 1.1.2, the media, especially television advertising, greatly affect children's consumer socialization. Compared with some Western countries, the

prevalence of television in China occurred much later. For example, in the UK, household television ownership reached 95% in 1970, and the average household television ownership was 1.48 in 2018 (Broadcasters Audience Research Board, 2019; Office of National Statistics, 2019). In China, television broadcasting started in 1958, and the prevalence of television has reached 99% of China's population by the end of 2017 (China Statistics Press, 2018). According to the Digital UK, there are 735 digital channels, and 9 of them are for children (e.g. Cbeebie) (Digital UK, 2019). In China, until May 2018, there were 78 television channels in China, and only 5 of them were children's channels (e.g. CCTV children channel) (World Press, 2018).

Since the Internet was created, the UK has been involved with it. There were only 9% of UK household had access to the Internet in 1998, and it reached 90% in 2018 (Statista, 2019a). China introduced the Internet in 1995, and the Internet penetration reached 59.6% by the end of 2018 (China Internet Watch, 2019; Tsui, 2003).

1.8.2 Advertising development in China

As with the delayed television development in China, advertising in China also developed late (Swanson, 1990; Zhao, 2005). At the first stage of the founding of new China in 1949, there was only little space for advertising development as the government restricted production, prices and consumption (Swanson, 1990). During the Cultural Revolution, from 1966 to 1976, advertising was banned as a capitalist symbol, and the first advertising agency did not occur until 1979 when the Open policy adopted (Chan & Chan, 2005; Zhao, 2005). Then from 1993 to 2001, average annual advertising revenue increased 25%, which made advertising one of the fastest developing industries in China (Chan & Chan, 2005; State Administration for Market Regulation, 2019; Tao, 2013).

In China, there has been a rapid growth of Internet advertising. In 2018, television advertising made 15.6 billion yuans but only took 27% of China advertising market, while the Internet advertising made 79.9 billion yuans and took 48% of the market (State Administration for Market Regulation, 2019). Ge (2019) provides several reasons for this change. First, advertisers spend a great deal on television advertising, but the return is limited, which lead more advertisers to transfer their advertising budgets to the web advertising due to the rapid development of online video platforms (Ge, 2019). Second, a major marketing strategy of television advertising is using celebrities as brand spokespersons. However, some advertisers choose hot celebrities, who then go on to advertise several products. Also, scandals of celebrities negatively affect the brand reputation, which make the 'celebrity effect' less attractive (Fong, Robert, & Wyer, 2012). Third, some advertising in mainland China is too dull and lacks innovation. For example, a brand of learning machine, which helps children to learn English (e.g. grammar and pronunciation) used the same prompting message for years without any changes. Although the constant repetition can make a deep impression (Singh & Rothschild, 1983), the mandatory delivery methods of repeated television advertisements might also have bored their audience (Alwitt & Prabhaker, 1994). Fourth, some television advertising in China has made false claims, and those have negatively affected attitude and belief in a brand (Chan & McNeal, 2002; 2004b; Ge, 2019). According to official statistics, over 41,300 illegal advertising cases with fines of 758 million yuans in total were reported in 2018 by the State Administration of Industry and Commerce (2019).

1.8.3 Advertising laws and regulations in China

In China, only about 3% of advertising-related regulations and laws refer to children (Yang, 2008), these focus on advertising's in relation to children's socialist and spiritual development. (Chan & McNeal, 2002; Gao & Kim, 2009). For example, the *Advertising*

Regulation Standard (Article 42) banned advertisements that show immoral behaviour or attitudes (e.g. encourage disrespectful to elders or others) or harm children's physical health (e.g. show acts that children could not undertake alone).

In addition, the only one standard came from the Article 37 of the *Advertising Regulation Standard* defined children's advertising as 'advertising of products to be used by children or advertising using children as models' (State Administration of Commerce and Industry, 2019). However, this definition has three major issues. First, there is no clear definition for what age should be considered as children. According the Article 2 from the *Law of the People's Republic of China on the Protection of Minors*, which followed the Article 1 of the *Convention of the Rights of the Child* issued by the United Nations, children refers to people under the age of 18. While reports from the China Internet Network Information Center (CNNIC) regard citizens under the age of 14 as children. Second, the standard was not clear about broadcasting platforms, and children might be exposed the advertising not just on television, but also in other places, such as elevators or bus stations. Third, according to the standard, children's advertising did not include advertisements promoting children-targeted products without child models.

1.8.4 Chinese children's media use

In China, according to the CNNIC report (2018), there were more than 25 million children younger than 10 years using the Internet up to December 2017 with an increase of nearly 7 million from the end of 2015 (CNNIC 2015, 2018). As there is an uneven economic development in China, children's attitudes and usage of media may be varied in different areas of the country. According to CNNIC's Young Adult Online Behaviour Report (2016), there were more urban teenagers (72%) using the Internet than the rural teenagers (28%) in the age range of 6 to 24.

Only a few studies in China have measured Chinese children's media use (Chan & McNeal, 2006b; Gou & Dezuanni, 2018; Zhao et al., 2018). Gou and Dezuanni (2018) collected data through parent-report questionnaire from 1,171 pre-school children aged 3 to 7 years old in 2017. They randomly chose 5 provinces from 27 ones, which were clustered into three categories based on their economic and educational level. The best-developing city was chosen due to the higher rate of kindergarten attendance. Municipalities were chosen from Beijing, Shanghai, Tianjin and Chongqing as they had comparable populations and economic development and because these municipalities were directly organized by the Central Government. Then a random kindergarten was chosen in the 6 cities and a questionnaire were sent to the caregiver of each child. In Gou and Dezuanni's research, there was no effect of age and gender on Chinese children's screen time, which might because children in their research were from a very narrow age range. Sibling presence was associated with television viewing time because television might have been more suitable for children to watch together than other devices. Gou and Dezuanni (2018) have also found that children spent more time on television and smartphones when they are taken care of by grandparents. While Zhao et al (2018) recruited 20,234 children aged 3 to 4 years old and measured factors that affected their media use. In line with some Western studies (Anand & Krosnick, 2005), they found that boys spent more time on screen media, and the screen time significantly increased in older age children, with lower socioeconomic status of the family, including the household income and material education, with siblings, with parental divorce and with the father as the primary caregiver (Zhao et al., 2018).

Chan and her colleagues have measured the effect of urban-rural gap on children's media use (Chan, 2008; Chan & McNeal, 2002, 2006b, 2006c). For example, Chan and McNeal (2006b) recruited nearly 2,000 children aged 6 to 13 years old from four urban cities (Beijing, Guangzhou, Nanjing, Shanghai) and four rural areas in four provinces

(Heilongjiang, Hubei, Hunan, Yunnan). They measured and compared rural and urban children's media ownership, media usage and attention of advertising. Chan and McNeal made several conclusions in terms of their findings. First, urban children had higher media ownership, media exposure and media usage than rural children. Second, rural children had higher ownership of and exposure to television, while urban children had exposure to other types of media, for example, computers and DVD players. Third, television advertising received more attention from rural children while other types of advertising received more attention from urban children. In line with this research, Chan (2008) reported other findings of the urban-rural gap of Chinese children's media use. Chan measured children's perceptions of the truthfulness of television advertising and their judgement of television advertising, and recruited 6-9-year-olds and 10-15-year-olds from mainland China. Chan reported that urban children were more sceptical to advertising than rural children, and that younger children were more likely to trust and like television advertising than were older children.

In summary, compared with some Western countries, such as the UK, China has relatively few television channels for children and few regulations focus on advertising effects on children. Lack of regulations has made Chinese children expose to similar extent or even more advertising than their peers in the UK. However, there have been less research in China focus on advertising's effect on children and children's awareness of advertising compared with some Western countries. This thesis aims to extend literature of children's awareness of web advertising by carrying out studies that focus on children's recognition of search engine advertising in China and the UK. Details about research objectives and aims are discussed in Section 1.9.

1.9 Research aims

Marketers have targeted children as the increasing potential market due to children's direct and indirect purchasing power (Baldassarre, Campo, & Falcone, 2016; Connor, 2006). Today's children's lives are deeply embedded in mass media, and marketers have attempted to spread their advertising surrounding children via those media, such as the television (see Section 1.1.2). Previous literature indicates that children are able to distinguish television advertising from programmes by the age of 5 years, and show some understanding of the intent of television advertising by the age of about 8 years (see Section 1.3). Research shows that children could use cues, such as separators (Butter et al., 1981; Stutts, Vance, & Hudleson, 1981) to distinguish television advertising from programmes (see Section 1.3.2). Besides the television, the Internet has become a major part of children's education and entertainment with the technology development (see Section 1.5).

Previous research focusing on children's recognition of web advertising shows that children are able to identify most of web advertising at about 12 years old, which is much later than the age that they could identify televising advertising (see Section 1.6.2). Some types of web advertising, such as search engine advertising, have blurred boundaries with its content, which increases the difficulty for children to recognize them (see Section 1.6.3). Only Li et al (2014) have conducted research in the UK investigating at what age children can recognize search engine advertising, and the results showed that children could recognize most of search engine advertising at about 12 years old (see Section 1.6.3). Li et al's (2014) finding in China was in line with Ali et al's (2009) finding in the UK and Indonesia. No previous research examined at what age Chinese children could recognize search engine advertising. Hence, this thesis aims to investigate when Chinese children can recognize search engine advertising from its surrounding content (see Chapters 3 and 4).

Country-to-country differences have been reported to affect children's consumer socialization (see Sections 1.1.3 & 1.7). To investigate whether there is a difference in children's media use between China and UK, Study 4 examined UK children's performance in recognizing search engine advertising using an English version of the materials used in research in Chinese Studies 2 and 3 (see Chapter 5).

Picture-based message is more attractive and supports word recognition and comprehension than text-based message for people with lower literary skills, like the children (Goodrick, 2011; Houts et al., 2006; Pieters & Wedel, 2004). Children may pay more attention to the picture-based advertisements than text-based advertisements, and find it is easy to recognize the picture-based ones. However, according to the LCMP (Lang, 2000) and the PCMC model (Buijzen et al., 2010), processing both picture and text messages might cause overloads to children's limited cognitive abilities and make children unable to fully process and evaluate the web advertising. Hence, another purpose of this thesis is to examine the prediction that children might perform better in recognizing picture-based search engine advertising than text-based search engine advertising (see Chapters 3 to 5).

As there is no national survey about Chinese children's access and media use, Study 1 aimed to provide a pattern of Chinese children's media use in provincial level and roughly compared with UK children's media use pattern based on Ofcom (2018a) report.

CHAPTER 2

2. STUDY 1: UNDERSTANDING YOUNG CHILDREN'S MEDIA USE IN CHINA AND UK

2.1 Introduction

Modern technology, such as digital devices and high-speed Internet, has been used as a fundamental way to improve people's lifestyle, including their work, communication and free-time activities (Cheung & Huang, 2005; Gialamas, Nikolopoulou, & Koutromanos, 2013). Today's children, often called the 'digital natives' (Prensky, 2001a, 2001b), have access to multiple digital tools, which have become their daily essentials (CNNIC 2018; Common Sense Media, 2017; Kostyrka-Allchorne, Cooper, & Simpson, 2017; Ofcom 2018a).

Today's children have expanded media use and accumulated media use knowledge from a young age (Brown et al., 2011; Holloway, Green, & Livingstone, 2013; Kostyrka-Allchorne, Cooper, & Simpson, 2017). Such phenomenon has raised concerns about children's mental development, physical development and children's online safety issues among child advocates and researchers (Brown, et al., 2011; Kostyrka-Allchorne, Cooper, & Simpson, 2017; Radesky, Schumacher, & Zuckerman, 2015).

To monitor this situation, a few Western countries conduct annual national surveys about how children and their parents use media, for example, Office of Communication (Ofcom) in the UK (Ofcom, 2017, 2018a) and Common Sense Media in the US (Common Sense Media, 2017).

2.1.1 Influence of digital media

Digital media has a two-side influence on children, both helpful and harmful (Radesky, Schumacher & Zuckerman, 2015). For the positive influence, children are able to learn about the world via digital media (Lieberman, Bates, & So, 2009; Moyer-Packenham et al., 2016). Children may see digital media as a 'playbox' that can contribute to their mental and physical development (Goodall et al., 2013; Staiano & Calvert, 2011). For example, touchscreens provide children with physical interactions, and may facilitate children's learning (Moyer-Packenham et al., 2016). For the negative influence, inappropriate media exposure has been associated with various deleterious issues, such as mental health problems, obesity, cyber-bullying, and problematic Internet use (Kowalski & Limber, 2013; Spada, 2014; Strasburger, 2011). For example, as mentioned in Section 1.1.2.1, Chapter 1, obesity among children has become a serious global health issue in the past two decades (Klesges, Shelton, & Klesges, 1993; Lobstein, Baur, & Uauy, 2004; Strasburger, 2011). Researchers have found that food advertisements have been a large proportion of television food advertisements, and the high exposure of television unhealthy food advertisements has been associated with children's food preferences, consumption behaviours, and obesity (Boyland & Halford, 2013; Boyland, Harrold, Kirkham, & Halford, 2011; Hu et al., 2019; Li, Ye, Blades, & Oates, 2016; Sadeghirad et al., 2016).

Empirical evidence emphasizes the influence of digital media, especially the television advertising, on children's mental and physical development (De Jans et al., 2019; Kunkel et al., 2004). As children's underdeveloped cognitive skills restrict their abilities to counter inappropriate advertising effects by themselves, some protective actions, such as regulations for children targeted advertising and guidelines to parents about how to reduce the negative effects of digital media, have been made to provide a better media environment for children.

2.1.2 Guidelines and regulations for children's media use

Annually documented surveys about children's and parents' media use and attitudes, such as Ofcom (2017, 2018a) and Commen Sense Media (2017), have influenced policies to regulate the media. *Europe's Kids Online Recommendations* (2014) have given suggestions to both governments and industries to regulate media. For governments, they should cooperate with multi-stakeholders to improve the Internet safety, formulate adequate legislative provision to deal with the dark side of the Internet (e.g. cyber-bullying, online harassment), and make efforts to support digital inclusion (Europe's Kids Online Network, 2014). For industries, they should label their commercial contents to be clearly recognizable, implement tools to remove unsuitable content for under-18s, and adopt appropriate methods about the age verification for youth protection (Europe's Kids Online Network, 2014). The latest *Children and General Data Protection Regulation* (GDPR), issued by the Information Commissioner's Office from European Union, took effect in May 2018. The GDPR claims children need special protection in the current media environment, and children-targeted messages should deliver in clear and plain language for an easy understanding. The GDPR also suggests parents should be digital guardians to protect their children from harmful influence of media.

In the US, the American Academy of Pediatrics (AAP) has issued one policy statement that discourages the media use, especially television viewing, by children younger than 2 years (American Academy of Pediatrics, 1999). Brown et al (2011) reaffirmed this statement and suggested that media exposure to children younger than 2 years may have more negative effects rather than positive effects. Researchers have argued that although extensive media exposure is common for most families, and parents let their children use media assuming media are educational, there is a lack of

evidence to support a positive educational effect on young children (Brown et al., 2011; Radsky, Schumacher, & Zuckerman, 2015). The AAP (2016) updates its screen time guidelines based on a child's age (American Academy of Pediatrics, 2016). The AAP suggests that time spent on media should still be limited for children aged 6 years and older, and parents should make sure the screen time would not interrupt children's normal development, such as adequate sleep and outdoor activities. In addition, a media free family time (e.g. dinner time), and a media free location at home (e.g. child's bedroom) are also recommended (American Academy of Pediatrics, 2016). Viner, Davie and Firth (2019) from the Royal College of Paediatrics and Child Health consult children (younger than 11 years old) and young adults (11-24 years of age) from the UK and published guidelines to help parents manage their children's screen time. The guidelines suggests parents should make screen time rules in terms of children's specific needs at different ages, including the child's need for online studying (Viner, Davie, & Firth, 2019).

China introduced the Internet in 1995, and the first Internet-related laws and regulations in China were made in 1996 (Tsui, 2003; Zheng, 2013). Before the Internet entered China, the Chinese government had complete controlled over all types of media, including television, radio and newspapers (Xu & Albert, 2014). To maintain control of new media, the Chinese government launched laws and regulations over years, which were mainly based on other countries' Internet development experience, but taking China's particular political, social and economic situation into account (Zheng, 2013). There are two main regulations governing the Internet environment in China, which are The *Interim Provision governing Management of Computer Information Networks* (Feb, 1996; Decree, No.195) and *Measures for Managing Internet Information Services* (Sep, 2000; Decree, No.292) (Zheng, 2013). Both regulations aim to prevent producing and distributing four types of information online, including information that might harm national security, disclose national secrets, threaten social stability, or contain sexual

content (Suo, Wan, Zou, & Liu, 2012; Tsui, 2003; Zheng, 2013). Besides the Internet-related regulations and laws, the Chinese government has developed filtering systems to censor Internet content, like the Golden Shield launched in 2003, known as the 'Great Firewall of China' in Western literature (Fallows, 2008). The Golden Shield works to filter undesirable or politically sensitive information, for example, deterring any web pages or websites that contain references to the 'Tibet/Taiwan Independence' (Fallows, 2008).

2.1.3 Research about children's media use in China

As mentioned in Section 1.8.2, Chapter 1, there has been an increasing amount of Chinese children using the Internet (CNNIC 2015, 2018). However, there might be an urban-rural digital divide in China, because the number of urban teenagers used the Internet was nearly triple times with the number of rural teenagers (CNNIC, 2016),

Previous research in China has shed a light on the status quo of Chinese children and parents' media use and attitudes (Chan, 2008; Chan & McNeal. 2006b; Gou & Dezuanni, 2018; Zhao et al., 2018). Chan and her colleagues compared the media usage patterns among children aged 6 to 13 years old living in Chinese rural or urban areas in the early 2000s. For example, Chan and McNeal (2006b) found that television was the dominant media for Chinese rural children, Chinese urban children generally owned and used more types of media. Television advertising received more attention from Chinese rural children, and Chinese urban children paid more attention to advertising delivered via other media platforms (Chan & McNeal, 2006b). Chinese urban children were also reported to hold more sceptical attitudes to advertising than Chinese rural children, and younger Chinese children were more likely to trust and hold positive attitudes to television advertising than older ones (Chan, 2008).

Chinese children are able to access and use different media at home (CNNIC, 2015, 2016, 2018; Gou & Dezuanni, 2018). For example, Gou and Dezuanni (2018) found that a typical urban Chinese family has about 1.42 televisions, 0.7 desk computers, 1 laptop, 2.96 smartphones, and 0.15 game players. According to the latest *Blue Book for Children: Annual Report on Chinese Children's Development* (China National Children Center, 2019), doing homework, playing outside and using digital devices are top three activities in Chinese children's after school time. On a typical school day, children spend about 1.5 hours on their homework from school, parents and extra-curricular tutoring, 0.8 hours play outside, and 0.7 hours use digital devices. On a typical weekend day, Chinese children spend 1.9 hours on homework, 1.9 hours play outside and 1.6 hours use digital devices. Chinese parents invest in their children's education from the time when the children are born, with the aim of giving their children a head start in the future labour market (Chen, 2016; Wu, 2012). Such investment in education at the initial stage includes educational toys, early education classes and exposure to educational media, and parents believe such early education will benefit their children's development (Zheng et al., 2012). The report suggests that extra-curricular tutoring adds more burden to children's life and study, which have been reported to affect children's sleep time and quality and leave little space for children's leisure time (China National Children Center, 2019; Lushington et al., 2015). Besides, as one of the top three activities in both children's school days and weekends, media use has been attractive to children. Researchers point out use too much media devices not benefit children's mental and physical health, and they suggest parents to balance children's study and leisure time, so as to provide children with a high quality childhood (China National Children Center, 2019; Hu, Kong, & Roberts, 2014).

Western research indicates demographic factors, especially familial, economic and geographic contexts, affect children's media use (Jordan, 2016). In China, research shows that the mothers' educational level is negatively correlated with children's total

screen time, family incomes are significantly related to children's access and use of different media, and children spent more time on television and smartphones when they are taken care of by grandparents (Gou & Dezuanni, 2018). Zhao et al (2018) found that the screen time was significantly increased in older age children, with the lower socioeconomic status of the family, including the household income and material education, with siblings, with parental divorce and with the father as the primary caregiver (Zhao et al., 2018).

Study 1 aimed to provide a context for understanding the development of Chinese children's media use. Data of Study 1 was collected from 404 Chinese children (aged 5 to 14) through a 'children's media use and attitude' questionnaire from January 2018 to April 2018. Six major dimensions of questions involved in the questionnaire, including children's media usage pattern, early usage pattern, media device use in the home, preference of media devices, understanding of paid-for search engine advertising, and parents' regulation of children's media use.

As there were no raw data in the Ofcom report (only summary findings), Study 1 only comments on the similarities and differences between the data collected in Study 1 and the data summarized in the Ofcom (2018a). Based on findings from Gou and Dezuanni (2018), we have made several expectations for Study 1. First, Chinese children spent a great amount of time on different types of media, although their parents might make rules for their media use. Second, there would be no much difference in the time and type of media use between Chinese and UK children when compared with the Ofcom (2018) data. Third, Chinese children might have a similar poor understanding of the sponsored nature of search engine advertising compared with their peers in the UK.

2.2 Method

2.2.1 Chinese participants

The Ofcom (2018a) questionnaire was conducted April to June 2018. It measured the media use, attitudes and understanding among children and teenagers aged 5 to 15 years old. Ofcom interviewed, face to face 1,375 participants, in 3 age groups, 5-7 years old, 8-11 years old and 12-15 years old (see Table 2.1). The questionnaire was accredited by Ofcom and conducted by an independent market research company called Quadrangle Operations. Questions from Ofcom (2018a) in the present questionnaire in China were used with the permission of Ofcom.

Table 2.1 Demographic characteristics of children Ofcom (2018a)

	Range	N	%
Age	5-7 (M:219, F:229)	448	31.3
	8-11 (M:244, F:253)	497	34.8
	12-15 (M:248, F:237)	485	34.0
Gender	Female	719	50.3
	Male	711	49.7
Total		1430	100

Table 2.2 shows the demographic characteristics of Chinese children in Study 1. There were 404 participants, who were divided into 3 age groups in line with Ofcom report, 5-7 years, 8-11 years and 12-14 years. As the oldest Chinese children in Study 1 was 14 years old, the third age group was divided as 12 to 14 years. There were nearly equal numbers by gender in each age group, and 224 children from an urban area, Yantai, Shandong Province, PR China, and 180 children from a rural area, Binzhou, Shandong Province, PR China. This study had received ethics approval from the Department of Psychology Ethics Sub-Committee at the University of Sheffield.

Table 2.2 Demographic characteristics of children

	Range	N	%
Age	5-7 (M:56, F:58)	114	28.2
	8-11 (M:77, F:80)	157	38.9
	12-14 (M:69, F:64)	133	32.9
Gender	Female	202	50.0
	Male	202	50.0
Region	Urban	224	55.5
	Rural	180	44.6
Total		404	100

2.2.2 Materials

To evaluate Chinese children's media use and attitude to the media, the questionnaire for Study 1 contained 17 questions from Ofcom's Children and Parents' Media Use and Attitude Report in 2017 (see Figure 2.1), and there were two reasons for adopting items from the Ofcom report. First, Ofcom's questionnaire for children and parents' media use and attitudes had been conducted since 2009 in the UK, which conducted the media literacy survey based on the terms of the Section 11 of the Communications Act 2003. The Ofcom survey was drawn from the finding of a quantitative survey, the Media Literacy Tracker 2009, which combined the Media Literacy Audit and the Young People's Media Usage survey (Ofcom, 2009). Second, the questionnaire recruited children aged 5 to 15 years old and provided an overview of media literacy development among UK children aged 5 to 15 years old and their parents since 2009.

Questionnaire

Age: Gender:

Part 1: Fill in part

1. How long will you use the below devices on a normal day? (In hours) television_____ computer_____ smart phone_____ game player_____

Part 2: One choice questions

2. Do you need to attend the extra-curricular tutoring? If you do, how many days in a week? A: I do not take extra-curricular tutoring B: 1 day C: 2 days D: 3 days E: 4 days F: 5 days G: 6 days H: 7 days
3. Where do you usually go online? A: At home B: At school C: At the Internet bar D: At a friend's home E: At extra-curricular tutoring F: Other
4. Does your family accompany you when you go online? A: Rarely B: On occasion C: Often
5. When did you start using the Internet? A: Before 6 years old B: 7 years old C: 8 years old D: 9 years old E: 10 years old F: 11 years old G: 12 years old H: Other
6. Who you usually watch television with? A: Parents B: Grandparents C: Sister/Brother D: Just myself E: Others
7. Do you prefer to watch video website (e.g. Youku), television programmes, or do you like both the same? A: Television B: Video websites C: Both television and websites

8. Below is an image from Baidu searched results for 'trainers'. Do any of these apply to the first two results that are listed?

A: They are adverts/sponsored links/paid to appear here

B: These are the best/most relevant results

C: These are the most popular results used by other people

D: None of these/do not know

9. If you saw something online that you found worrying nasty of offensive in some way that you did not like, would you let someone know about it?

A: Yes, I will B: No, I will not C: Don't know/Not sure

10. When you go online you may visit sites or apps which you use for school work/homework. If so, do you believe that all of the information you see:

A: All is true

B: Most information is true

C: Some of it is true

D: Don't know/Not sure
11. When you go online you may visit sites or apps about news and what is going on in the world. If so, do you believe that all of the information you see: A: All is true B: Most information is true C: Some of it is true D: Don't know/Not sure
12. When you go online you may visit social media sites or apps like Weibo, WeChat and QQ. If so, do you believe that all of the information you see: A: All is true B: Most information is true C: Some of it is true D: Don't know/Not sure

Part 3. Multiple-choice questions (Take all that apply)

13. Which devices do you use in your home? A: Television B: Computer C: Game player D: Kindle E: Tablet F: DVD/VCD G: Smart phone
14. Have you done any of these things online? A: Study B: Listen to music C: Play games D: Change/edit pictures E: Watch videos F: Communicating with friends G: Others
15. Do you ever use any of these devices to watch television programmes? A: Television B: Tablet C: Computer D: Game player E: Smart phone
16. Which activity do your parents restrict for you? A: Online surfing B: Playing games C: Watching Television D: Reading cartoon books

17. What are your top three favourite television programmes? A: Cartoon B: Movie C: Drama D: Talk shows E: News F: Music G: Science H: Others
18. Which things do you not like about being online? 19. Which things would you stop if you could? A: Too many adverts B: Seeing things make you feel sad, frightened or embarrassed C: People being nasty, mean, or unkind to other people D: Someone pretending to be other people's age and try to go know other people or trick other people E: Strangers might find out information about other people F: Feeling pressure to make online or in-app purchases G: Sometimes spending too much time online H: Websites being blocked so cannot view anymore
20. If you saw something online that you found worrying, nasty of offensive in some way that you did not like, would you let someone know about it? Please rank in order from 1, who you prefer to tell first, to 4, who you prefer to tell last. Family member Teacher Friends Police Someone else (including yourself)

Figure 2.1 English version of the questionnaire for Study 1

调查问卷

年龄:　　性别:

第一部分: 填空部分

1. 你每天会分别使用以下设备大约多长时间 （小时）

电视_____ 电脑_____ 手机_____

游戏机_____

第二部分: 单选部分

2. 你一星期参加多少天课后补习班?

A: 我不参加课后补习　B: 1天　C: 2天　D: 3天　E: 4天　F: 5天　G: 6天　H: 7天

3. 你通常在哪里上网?

A: 在家　B: 在学校　C: 在网吧　D: 在朋友家　E: 在课后补习班　F: 其他

4. 你家人会陪你一起上网吗?

A: 几乎不　B:偶尔会　C: 经常

5. 你从几岁开始上网?

A: 6岁前　B: 7岁　C: 8岁　D: 9岁　E: 10岁　F: 11岁　G: 12岁　H: 其他

6. 你常和谁一起看电视?

A: 爸妈　B: 兄弟姐妹　C: 爷爷/奶奶/姥姥/姥爷　D: 自己看　E: 其他

7. 你更喜欢看网上视频 （例如：优酷网）， 看电视节目，或者两个都喜欢?

A: 电视　B: 视频网站　C: 电视和视频网站

8. 下图是在百度搜索中搜索“运动鞋”后的结果。 以下那种情况符合图中前两个搜索结果?

A: 是广告/赞助商链接/按付费排序

B: 是最好的/最相关的结果

C: 是相关热搜的结果

D: 以上都不是/我不知道

9. 如果在网上看见任何让你不喜欢，感到担心，或不舒服的内容你会让别人知道吗？

A: 是的，我会 B: 不，我不会 C: 我不知道/不确定

10. 当浏览新闻或当下时事报道相关的网站或app小程序时，你是否认为这些网页或小程序上看到的所有信息：

A: 都是真的

B: 大部分是真的

C: 只有部分是真的

D: 我不知道

11. 当浏览新闻或当下时事报道相关的网站或app小程序时，你是否认为这些网页或小程序上看到的所有信息：

A: 都是真的

B: 大部分是真的

C: 只有部分是真的

D: 我不知道

12. 当浏览社交相关的网站或app小程序时，你是否认为这些网页或小程序上看到的所有信息：

A: 都是真的

B: 大部分是真的

C: 只有部分是真的

D: 我不知道

第三部分： 多选题（选择所有符合答案）

13. 你在家会使用那些电子设备?

A: 电视 B: 电脑 C: 游戏机 D: 电纸书

E: 平板电脑 F: DVD/VCD G: 手机

14. 你上网时会做什么?

A: S学习 B: 听音乐 C: 玩游戏 D: 查看/编辑图片

E: 看视频 F: 在线聊天 G: 其它

15. 你会使用以下哪些设备观看电视节目？

A: 电视 B: 平板电脑 C: 电脑 D: 游戏机 E: 手机

16. 爸爸妈妈会限制你的以下哪些活动？

A: 上网 B: 打游戏 C: 看电视 D: 看漫画

17. 你最长看哪三类电视节目？

A: 卡通 B: 电影 C: 综艺 D: 新闻 E: 音乐 F: 科教

G: 其它
18. 以下哪些是你在上网时不喜欢看到的？ 19. 以下哪些是你希望不再出现在网上的？ A:太多广告 B: 看到令人伤心，恐惧或尴尬的内容 C: 人们可能会刻薄的或恶意的对待他人 D: 有人假装成同龄人并试图了解或欺骗他人 E: 陌生人可能会找到其他人的个人信息 F: 网上支付的不确定性压力 G: 花了太多时间上网 H: 网站被封锁了
20. 如果看到以上不喜欢的网络内容，你会最先告诉谁？请按“最先会告诉的人”顺序1到4递减 家庭成员（父母等） 老师 朋友 警察 其他人（包括自己）

Figure 2.2 Chinese version of the questionnaire for Study 1

Some items from Ofcom 2017 survey were modified for use in China. For example, Item 8 (Ofcom, 2017) asked about children's understanding of search engine advertising, we replaced the Google searched results picture with a Baidu searched results picture using the same searched key words. Baidu has been the leading search engine in China, and Google has been blocked in the mainland China, since 2009. Some questions were added to the questionnaire to measure some factors that might affect Chinese children's media use and attitudes to the media. For example, Item 5 asked when Chinese children started to use the Internet.

2.2.3 Procedure

After acquiring permissions from headteachers, class teachers, parents and children themselves, the children were given the questionnaire as part of their homework to complete. Children were told to have their families to read to them if they could not read to themselves. Finished questionnaires were collected by the class teachers and forwarded to the experimenter the next day.

2.3 Results of the questionnaire

Similar to Ofcom's report (2017, 2018a) data from Study 1 were analysed in terms of children's age group (5-7 years old group, 8-11 years old group and 12-14 years old).

2.3.1 Children's media use

Tables 2.3 and 2.4 showed children's usage pattern of different digital devices in a typical week. Overall, children spent most digital media screen time watching television, and a smartphone was the second choice for children to use. While the gender and region factor was found to have no effect on children's media use.

Table 2.3 Mean for media use in a normal day (in estimated hours)

Item 1: How long will you use the following devices on a normal day (in hours)?			Television	Computer	Smart phone	Game player	Total screen time
	Age	5-7	0.82	0.20	0.82	0.15	1.99
		8-11	0.82	0.29	0.73	0.23	2.07
		12-14	0.90	0.32	0.65	0.48	2.35
	Gender	Female	0.79	0.27	0.79	0.18	2.03
		Male	0.90	0.28	0.67	0.40	2.25
	Region	Urban	0.89	0.28	0.74	0.25	2.16
		Rural	0.79	0.27	0.72	0.33	2.11

Table 2.4 Standard deviation for media use in a normal day (in estimated hours)

Item 1: How long will you use the following devices on a normal day (in hours)?			Television	Computer	Smart phone	Game player	Total screen time
	Age	5-7	0.70	0.50	1.01	0.46	1.66
		8-11	0.85	0.54	0.87	0.41	1.56
		12-14	0.83	0.62	0.74	0.81	2.02
	Gender	Female	0.72	0.55	0.94	0.43	1.60
		Male	0.88	0.57	0.80	0.71	1.89
	Region	Urban	0.83	0.54	0.89	0.53	1.62
		Rural	0.77	0.58	0.85	0.67	1.90

To test whether the data was normally distributed or not, the Kolmogorov-Smirnov test was used for each medium separately. The Kolmogorov-Smirnov results showed that none of the television watching time, $D(404) = 0.29$, $p < .001$, the computer using time, $D(404) = 0.37$, $p < .001$, the smart phone using time, $D(404) = 0.24$, $p < .001$, the game player using time, $D(404) = 0.39$, $p < .001$, and the total screen time, $D(404) = 0.17$, $p < .001$ were normally distributed. Hence, non-parametric analysis, the Kruskal-Wallis Test, was used for further data analysis.

The Kruskal-Wallis Test results showed that the television watching time, $\chi^2 (2) = 0.74$, $p > .05$, smart phone using time, $\chi^2 (2) = 0.13$, $p > .05$, and the total screen time, $\chi^2 (2) = 1.33$, $p > .05$, were not significantly different among three age groups. While computer using time, $\chi^2 (2) = 7.91$, $p < .05$, and game player using time, $\chi^2 (2) = 22.43$, $p < .001$ were significantly different between any two age groups.

As a Bonferroni correction was applied to control for Type 1 errors, all effects are reported at a $0.05/3 = 0.0167$ level of significance. A Mann-Whitney test was used as the *post hoc* tests for the Kruskal-Wallis Test, and the results of computer using time showed that the 8-11-year-olds spent significantly more time on the computer than the 5-7-year-olds, $U=7622.5$, $r=-.16$, $p<.0167$, and that the 12-14-year-olds spent significantly more time on the computer than the 5-7-year-olds, $U=6252.0$, $r=-.17$, $p<.0167$, but there was no difference for the time spent on the computer between the 8-11-year-olds and the 12-14-year-olds, $U=10057.5$, $r=-.01$, $p>.0167$.

For the time spent on the game player, the 8-11-year-olds spent significantly more time on the game player than the 5-7-year-olds, $U=7754.0$, $r=-.15$, $p<.0167$, the 12-14-year-olds spent significantly more time on the game player than the 5-7-year-olds, $U=5502.0$, $r=-.29$, $p<.0167$, and the 12-14-year-olds spent significantly more time on the game player than the 8-11-year-olds, $U=8808.5$, $r=-.17$, $p<.0167$.

2.3.2 Children's media devices use

Media use by children across three age groups is shown in Table 2.5. Television (78.9%) was the most selected device for 5-7-year-olds, and followed by the smart phone (75.4%) and the computer (43.0%). The smart phone was the most selected devices by 8-11-year-olds (81.5%) and 12-14-year-olds (79.7%), followed by the television (75.8% vs. 70.7%), and the computer (39.5% vs. 45.9%). While the gender and region factor was found not to affect children's media devices use.

Table 2.5 Media use by children across three age groups

Item 11:		**5-7-yr-olds**	**8-11-yr-olds**	**12-14-yr-olds**
Which devices do you use in your home? (Multiple choice question)	Television	78.9%	75.8%	70.7%
	Computer	43.0%	39.5%	45.9%
	Game player	6.1%	7.6%	5.3%
	Kindle	2.6%	3.8%	4.5%
	Tablet	24.6%	30.6%	25.6%
	DVD/VCD	3.5%	6.4%	3.0%
	Smart phone	75.4%	81.5%	79.7%

2.3.3 Children's understanding of paid-for results returned by a Baidu search

Children were presented with colour-printed searched web pages of Baidu, the most popular search engine in China (see Figure 2.3), and asked about their understanding of the top two listed results (A: They are adverts/sponsored; B: These are the best/most relevant results; C: These are the most popular results used by other people; D: None of these/do not know). The results were shown in Table 2.6.

Results showed that only 14.6% of the children chose answer A that correctly described the nature of sponsored search engine advertising as 'they are adverts/sponsored'. Specifically, 6.1% of the 5-7-year-old group, 14.0% of the 8-11-

year-old group, and 22.6% of 12-14-year-old group chose the correct answer for the paid-for nature of search engine advertising. As chance responding is 25% for this question, none of these results are better than just guessing. Gender and region factors were found not to affect children's understanding of paid-for results returned by the Baidu search.

Figure 2.3 Baidu's search results for 'trainers'

Table 2.6 Children's understanding of paid-for search engine results in different age groups

Item 7: The below is an image from Baidu search for trainers, do any of these apply to the first two results that are listed?		**5-7-yr-olds**	**8-11-yr-olds**	**12-14-yr-olds**	**Total**
	A: They are adverts/sponsored	6.1%	14.0%	22.6%	14.6%
	B: These are the best/most relevant results	22.8%	23.6%	26.3%	24.3%
	C: These are the most popular results used by other people	22.8%	10.8%	24.1%	18.6%
	D: None of these/do not know	48.2%	51.6%	27.1%	42.6%
	Total	100.0%	100.0%	100.0%	100.0%

2.3.4 Parents' rules for children's media use

Parents' rules for children's media use across three age groups are shown in Table 2.7, which demonstrated that playing games (61.1%) was the most regulated children's activity by parents, followed by online surfing (58.4%) for children aged 5 to 7 years old. While online surfing (62.4%) was the most regulated children's activity by parents for the 8-11-year-old group, followed by playing games (59.9%). For the 12-14-year-old group, parents mostly regulated their children's playing games (59.8%), followed by the online surfing (47.7%). While the gender and region factors were found to have no effect of parents' rules about children's media use.

Table 2.7 Parents' rules for children's media use across three age groups

Item 12: Which activities do your parents restrict you doing? (Multiple choice question)		**5-7-yr-olds**	**8-11-yr-olds**	**12-14-yr-olds**
	Online surfing	58.4%	62.4%	47.7%
	Playing games	61.1%	59.9%	59.8%
	Watching television	56.6%	49.7%	42.4%
	Reading cartoon books	30.1%	25.5%	39.4%

2.4 Comparisons between China and UK

2.4.1 Mean time spent on media devices in China and UK

The Ofcom (2018a, Figure 1 in Ofcom report), presented only the means of the media usage in the UK. Both means of Chinese and UK children's media usage are presented in Figure 2.4, which exhibited that UK children generally spent more time on these measured media devices than their peers in China. Specifically, UK children spent nearly triple time watching the television than their Chinese peers, and there was no age difference in each country children's television watching time.

As the number of children aged 5-7 years who owned their own phone was too low to report, here was no data for the UK 5-7-year-olds in the Ofcom report (2018a). Ofcom (2018a) report showed that UK children's time spent on the Internet, phone and game player were greatly increased with age. Study 1's results showed that there was no age difference in Chinese children's online time, and Chinese children's time spent on the phone and game player were decreased with age.

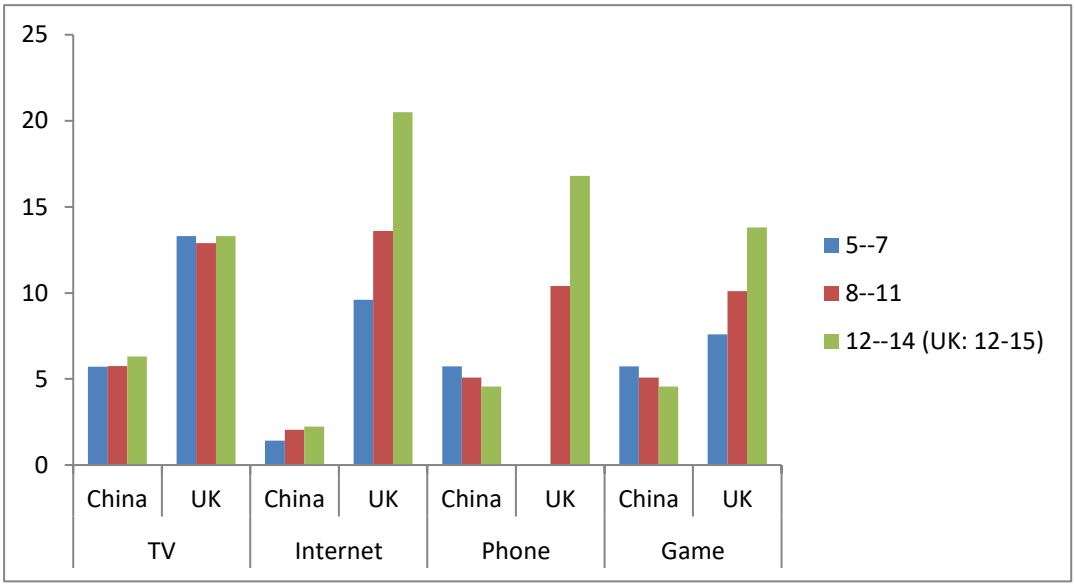

Figure 2.4 Mean time spent on four media devices in China and UK (hours per week)

2.4.2 Children's use of media at home between China and UK

Figure 2.5 showed children's media devices use in China and UK. The UK data were taken from Ofcom (2018a, Figures 9a and 9b in Ofcom report). Television was the main home media device for both Chinese and UK children, followed by the smart phone. Generally, Chinese children had lower usage of all types of media than did the UK children.

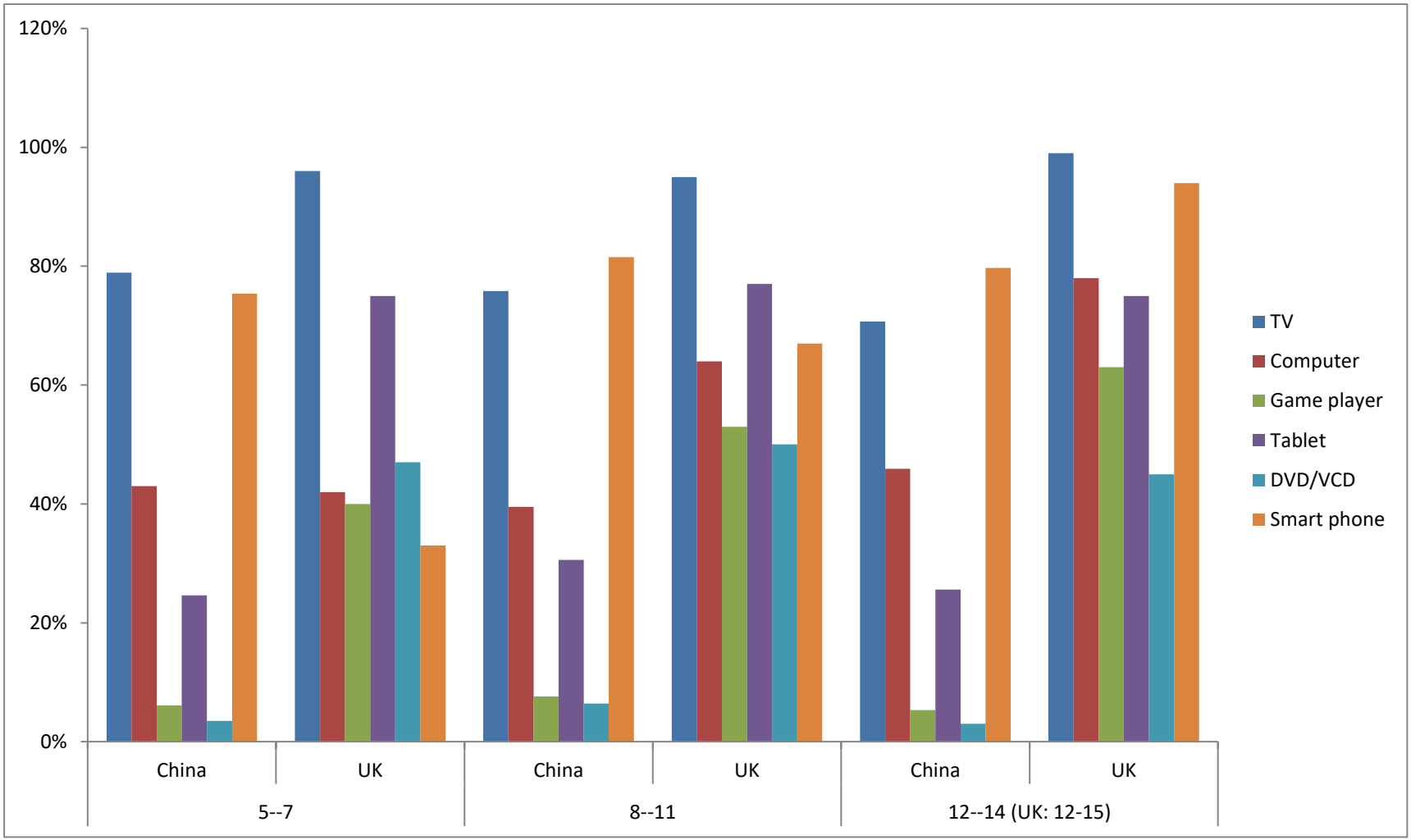

Figure 2.5 Children's use of television, computer and Game player in China and UK

2.4.3 Children's understanding of paid-for search engine advertising between China and UK

Figure 2.6 showed the comparison of children's understanding of paid-for search engine advertising between China and UK (Ofcom, 2018a, Figure 59 in Ofcom report). The UK children had more insight to the nature of sponsored search engine advertising as there were more UK children chose the correct description of the nature of paid-for search engine advertising, answer (A), than did their comparable age group in China.

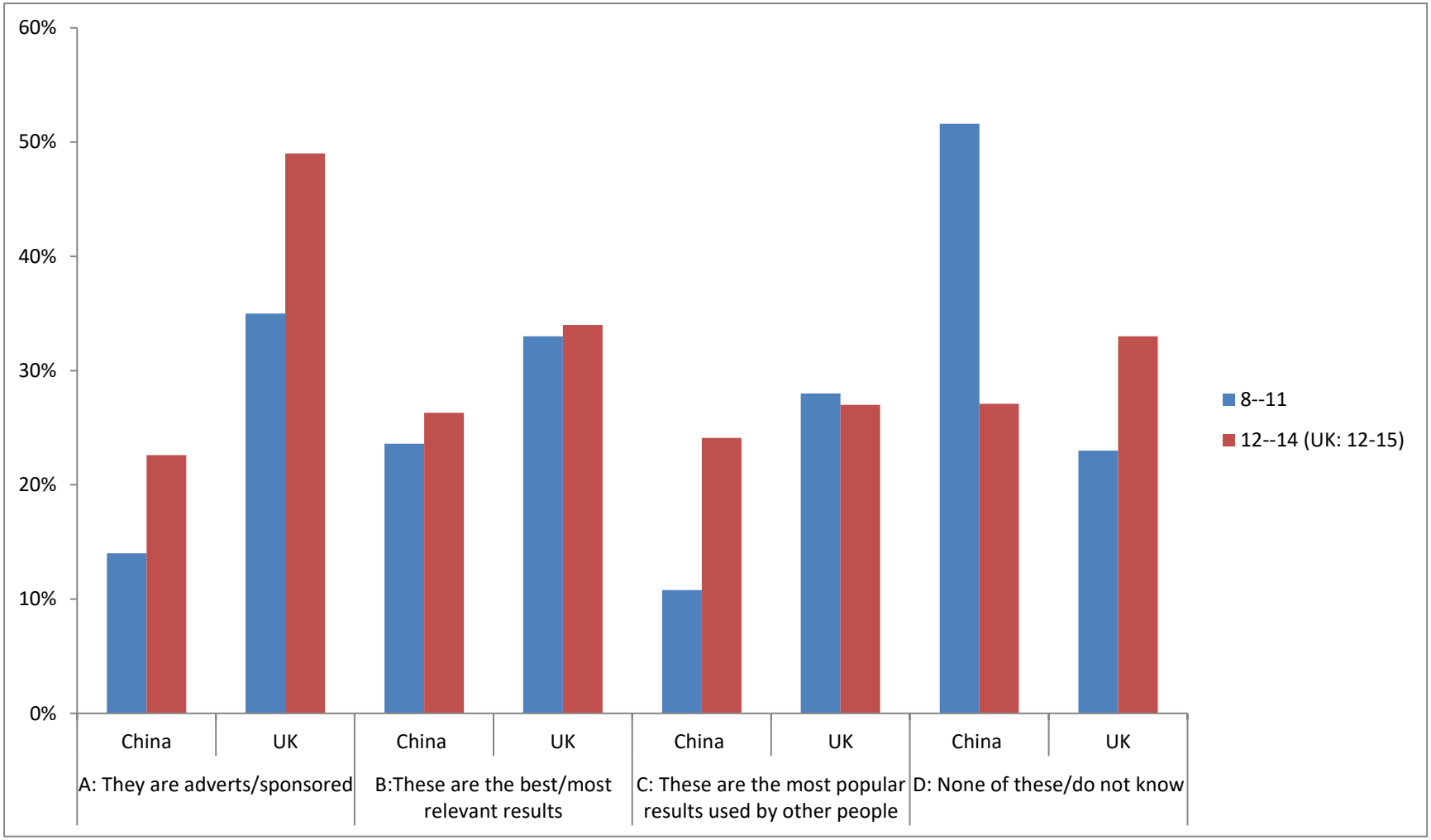

Figure 2.6 Percentage of children who giving each of the options for the question about search engine advertising of China and UK

2.5 Discussion

Study 1 provided information about Chinese children's media use, and then compared the children's media use and attitude between Chinese and UK children according to the Ofcom latest report (2018a). As there were no detailed data in the Ofcom report, any comparisons between Study 1's findings and those of Ofcom (2018a) should be treated with caution.

Results from Section 2.3.1 showed that television and smartphone were the two most used media for Chinese children. Consistent with previous literature, which has shown that television remains the dominant medium, and then the smart phone is the second most used mobile device for children in the China, the UK and US (Common Sense Media, 2017; Gou & Dezuanni, 2018; Ofcom, 2018a).

According to Ofcom (2018a), UK children spent more time using different media devices than did Chinese children. One possible reason is that Chinese children might only spend a limited after-school time on digital media (China National Children Center, 2019; Li & Wang, 2014). For example, Li and Wang (2014) conducted a survey in Beijing and reported that children generally spend their leisure time playing together with toys, taking part in outdoor activities and reading, and overall this was twice the time that children used digital media.

Parents are usually gatekeepers in children's media use, so their mediation affects children's media use (Lauricella, Wartella, & Rideout, 2015; Livingstone & Franklin, 2018). As noted in section 2.3.4, Chinese parents are more likely to make rules about the online surfing, playing games and watching television for their children, while there are fewer rules for reading cartoon books. In line with Study 1's results, Gou and Dezuanni (2018) found that Chinese parents paid more attention to the educational

function of media but less on the role of media's entertainment function. Gou and Dezuanni measured Chinese parents' attitudes to several major media, including the television, early educational tablets, tablets, smart phones and game console, and found that Chinese parents believe the smart phone and game player were harmful for children while the early educational tablets were helpful (Gou & Dezuanni, 2018).

Study 1 also showed that the age plays a role in affecting the time children spent on the computer and the game player, but not the time children spent on the television, smart phone or children's total screen time. According to previous research, adolescents are able to engage with parallel media activities via single or multiple media platforms (Jago et al., 2011). For example, as a meta-medium, the computer allows users to access multi-types of media streams simultaneously, like music and text, and switch between activities constantly. However, young children may lack the cognitive and motor skills, such as language competence and operating the keyboard, to use a computer or game player effectively (Kostyrka, Allchorne, Cooper, & Simpson, 2017).

Section 2.3.3 results showed that although children generally have a low accuracy of recognizing the paid-for results returned by Baidu search, their accuracy still increased with the age. As mentioned in section 1.4, Chapter 1, some developmental theories, such as theory of consumer socialization (John, 1999) and theory of consumer development (Valkenburg & Cantor, 2001), suggest children are able to reach adult-like understanding of advertising by the age about 12, which have been supported by empirical research on children's understanding of television advertising. However, Study 1's results indicated children could hardly understand the paid-for nature of search engine advertisements even when they were 14 years old. Hence, theories that could be applied to children's understanding of television advertising cannot apply to children's understanding of web advertising.

As mentioned in Section 1.6, Chapter 1, children's ability to recognize non-traditional advertising (e.g. web advertising) is developed much later than their ability to television advertising (Ali et al., 2009; An, Jin, & Park, 2014; Li et al., 2014). The delay might be because children's immature cognitive development and the covert format of non-traditional advertising (Ali et al., 2009, An, Jin, & Park, 2014; Li et al., 2014). Moreover, this result of Study 1 (see Section 2.4.3) also showed a higher percentage of UK children understood the paid-for nature of search engine advertising than did Chinese children. Based on 2.4.1 results, one possible reason was that UK children spent more time using the Internet than did their peers in China, so they are more likely to be experienced with such types of web advertising and more likely to understand its paid-for nature as advertising.

In summary, Sudy 1 expanded knowledge of current children's digital life in China, and showed that digital media was a large part in Chinese children's lives. More research is needed to identify digital media's effects on Chinese children's mental and physical development, and to develop appropriate guidelines and policies. After comparing with UK children in terms of the Ofcom data, Chinese children had a poorer awareness of the nature of search engine advertising than their comparable age peers in the UK. To explore this result, another three studies were conducted to investigate when children are able to recognize the search engine advertising, whether the type of advertising (pictorial/text) affected their recognition, and whether children's ability developing to recognize search engine advertising is universal or not.

CHAPTER 3

3. STUDY 2: CHINESE CHILDREN'S ABILITY TO IDENTIFY PICTURE-BASED AND TEXT-BASED SEARCH ENGINE ADVERTISEMENTS

3.1 Introduction

As mentioned in Sections 1.1.2 and 1.5.2, Chapter 1, effects of different media on children has become a global issue, which has raised increasing concerns among policymakers, educators and parents (Common Sense Media, 2017; Ofcom, 2017, 2018a). Prensky (2001a, 2001b) initially calls today's children digital natives as they are born in a ubiquitous digital media age, which makes them live immersed in media and accumulate digital experience from a young age (Brown et al., 2011; Holloway, Green, & Livingstone, 2013; Kostyrka-Allchorne, Cooper, & Simpson, 2017).

Researchers have found that the media, especially television and the Internet, are able to influence children's consumer behaviour development including assisting children to build a product or brand recognition and preferences (Calvert, 2008; Connor, 2006; Lapierre et al., 2017). Children can become potential long-term consumers and can have a major influence on their households' spending (Baldassare, Campo, & Falcone, 2016; Connor, 2006). Given the large influence children have on family purchasing, advertisers attempt to embed their advertising into children's daily life via various media platforms, such as television and the Internet (De Jans et al., 2019).

The Internet search engine provides an efficient way of extracting key information from an abundant data base, which has been adopted by advertisers to target consumers who are likely to make a purchase based on their searched keywords (Du et al., 2017).

Search engine marketing plays an important role for marketers and online retailers. According to the US's Internet Advertising Bureau (IAB) report released in May 2019, search advertising revenue reached 48.4 billion dollars in 2018, which accounted for 45% of the all online advertising revenue of the US in 2018. Between 2017 and 2018 search engine revenue increased by 7.8 billion dollars. According to Statista (2019b), the search advertising spending in China has reached 21.9 billion dollars in 2019, which made China as the second most search engine advertising spending country after the US (36.3 billion dollars). As the third most search engine advertising spending country, in the UK, the spending on search engine advertising has reached 8.7 billion dollars in 2019 (Statista, 2019b).

Internet-based consumer behaviours have raised increasing attention, with researchers focusing on children's Internet-based media use, consumer socialization and attitudes to the Internet (Thaichon, 2017; Tufte & Rasmunssen, 2010). But only a few researchers have studied children's awareness of advertisements on web pages (Ali et al., 2009; Li et al, 2014), and no previous research has investigated when children can identify the sponsored advertising on search engine web pages in China.

3.1.1 Children's use of search engines and its implications

Current search engines were designed for adults rather than young users who have limited cognitive skills to appropriate process information on search engine web pages (Bilal & Kirby, 2002; Torres, Weber, & Hiemstra, 2014). The online search pattern has been found different between adults and children due to their different topics of interest, and different level of their computer skills and language capabilities (Kammerer & Bohnacker, 2012; Torres, Weber, & Hiemstra, 2014). For children, education and entertainment are the two main reasons for using search engines (Iwata et al., 2010). As more and younger children start to go online (Brown et al., 2011; Holloway, Green, &

Livingstone, 2013; Kostyrka-Allchorne, Cooper, & Simpson, 2017), children's online information search behaviour has drawn increasing attention (Bilal, 2000, 2001, 2002; Madden et al., 2006).

Lack of mechanical and cognitive skills has been reported limited children's ability to search online (Bilal, 2000, 2001, 2002; Madden et al., 2006). Studies conducted by Bilal and her colleagues (Bilal, 2000, 2001, 2002) focused on children's search behaviour and their usage of Yahooligans! (changed to Yahoo! Kids in 2006). Children aged, 11- to 13- year-olds, were recruited and asked to solve information search tasks. Researchers observed children's online search process and concluded that children's search effectiveness was hampered in two ways, including a lack of developed search skills, such as adequate vocabulary and content knowledge, and a limited understanding of using logical operators to refine a search (Bilal, 2000; 2001, 2002).

Madden et al (2006) interviewed 15 British children aged, 11- to 16-year-olds, about three Internet search processes. First, participants were asked to recall their last online information search and repeat that search. Second, participants were given a word (e.g. 'Blue', which referred to a boy band) and asked to interpret it, then search the interpretation online. Third, participants were asked to recall their last failed online information search, and repeat it. In the interview process, the participants were encouraged to explain their strategies for online information searching. The first search task showed how children search information online, which revealed whether children had an understanding of an appropriate 'search/associated vocabulary'. The second task explored children's online search strategies for 'lack of specificity' problems. Task three investigated what difficulties caused children's failure in a search. Madden et al found that children's success in searching information online determined by children's ability to use tools to explore on the Internet, the amount of children's previous experience of using the Internet and guidance of online search they received from adults

or peers. Madden et al (2006) indicated that although these determined factors were not directly linked with age, they were associated with it as their results showed that older children performed better at information search online tasks than younger ones.

Education and entertainment are two major reasons for children using search engines, but the current design of most search engines has not considered young children's limited abilities to using the search engines (Kammerer & Bohnacker, 2012; Torres, Weber & Hiemstra, 2014). To solve this issue, Torre, Weber and Hiemstra (2014) suggested that a query expansion and a query recommendation mechanism would improve the search effectiveness of children up to 12 years old as they have less cognitive skills than other age groups. Torres et al analysed young users' search and browsing behaviour to explore children's difficulties in online information searching and browsing. Torres et al employed query logs (from Yahoo!) aimed to quantify children's difficulties in information search and topics they searched for, and toolbar logs (from Yahoo!) aimed to feature children's browsing behaviour, especially what online activities triggered the search. Torres et al found that children first had difficulties formulating accurate queries with keywords, such as shorter query length and more use of natural language in online search. Second, children were more likely to click links in a prominent position, although that position might contain adult content or advertisements. Third, children's searched topics were narrower than adults, and the typical topics involving gaming, entertainment, and emailing based on Yahoo!'s log analysis. Fourth, web search (e.g. Wikipedia) was the most likely online activity that could trigger a further search. Fifth, there was a high frequency of web advertising clicks among children aged 6 to 12 years old (Torres, Weber & Hiemstra, 2014).

There are relatively few studies focused on children's recognition of web advertisements (Ali et al., 2009; Li et al., 2014). Li et al (2014) conducted the only study in the UK examining children's recognition of search engine advertisements.

However, no previous research has investigated Chinese children's ability to recognize search engine advertisements.

3.1.2 Children's recognition of advertisements in China

Most research on children's recognition of advertisements has been conducted in Western countries, and there has been little research in China, a country has the second largest child population in the world (Unicef China, 2018). As a developing country, China's economy and society have been in a transition process. According to China Statistical Yearbook (2018), China, as the most populous country, nearly reach 1.4 billion population by the end of 2017. The enormous population of China has led to huge market demands and also led to a disparity between rural and urban China (Yang, Huang, & Li, 2008). As mentioned in Section 1.7.1, Chapter 1, China has adopted the Single-Child Policy (1979-2015) and then the Two-Children Policy (2016-present) to control its population growth. The birth control policies have made Chinese children live as 'the little emperors' (e.g. Cameron et al., 2013), thus children had a substantial amount of money and a great influence on family spending (McNeal & Yeh, 1997, 2003). McNeal and Yeh (1997) reported that Chinese children could influence about 68% of their family spending, which surpassed their US peers who only influenced 45% of their family spending.

As mentioned in Sections 1.7.3 and 1.7.4, Chapter 1, Chan and her colleagues have investigated Chinese children's access an media use, information sources and attitude to advertising in the 2000s (Chan, 2008; Chan & Cai, 2009; Chan & McNeal, 2006a, 2006b, 2006c, 2007). However, research conducted by Chan and her colleagues did not include web advertising. Moreover, after more than one decade, there may have been changes in contemporary Chinese children's media use and possibly their attitudes to advertising.

3.1.3 Search engine comparison between Google and Baidu

Search engines work effectively to obtain information so that consumers can find out about products or brands before they make actual purchases (Berman & Katona, 2013; Rowley, 2000). For example, consumers can learn about product features, specifications and other consumers' reviews about the products. To gain more attention, some advertisers pay for priority positions on search output pages (Chen & He, 2011; Laffey, 2007).

Some websites, such as Google, have labelled their paid search results in two ways. In Google, there is a small square with the word 'Ad' to identify the paid links. Figure 3.1 shows part of the searched results for a Google search for 'student storage'. The first link is a paid advertisement for 'Lovespace', and the Lovespace non-sponsored result is listed after another three sponsored links. Figure 3.2 shows another format for Google's search results, using the example of a search for the term 'chair', which involves a carousel, including advertising with product pictures, usually present at the top of search output results. The page includes the word 'sponsored' to indicate the advertising content.

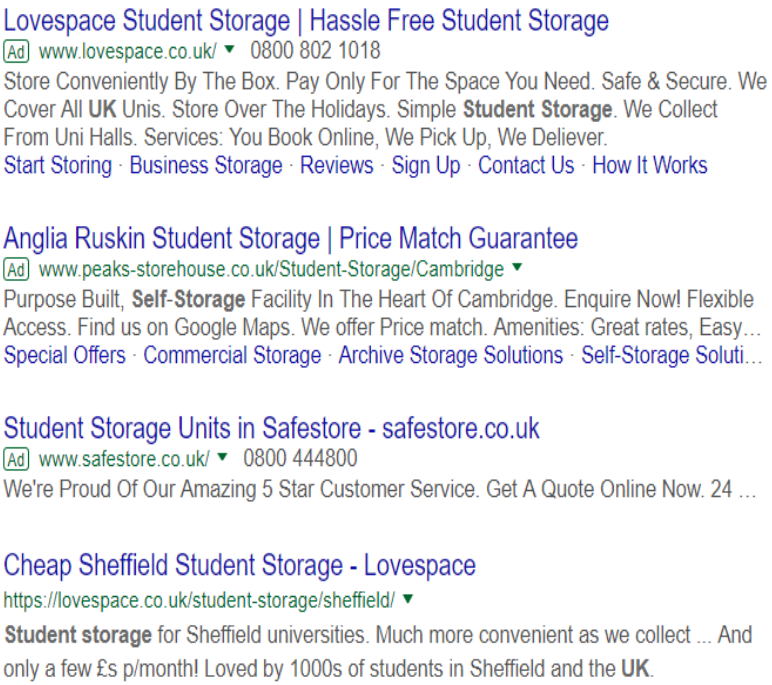

Figure 3.1. A page of search results for ‘student storage UK’ in Google including three sponsored at the top followed by one not-sponsored result.

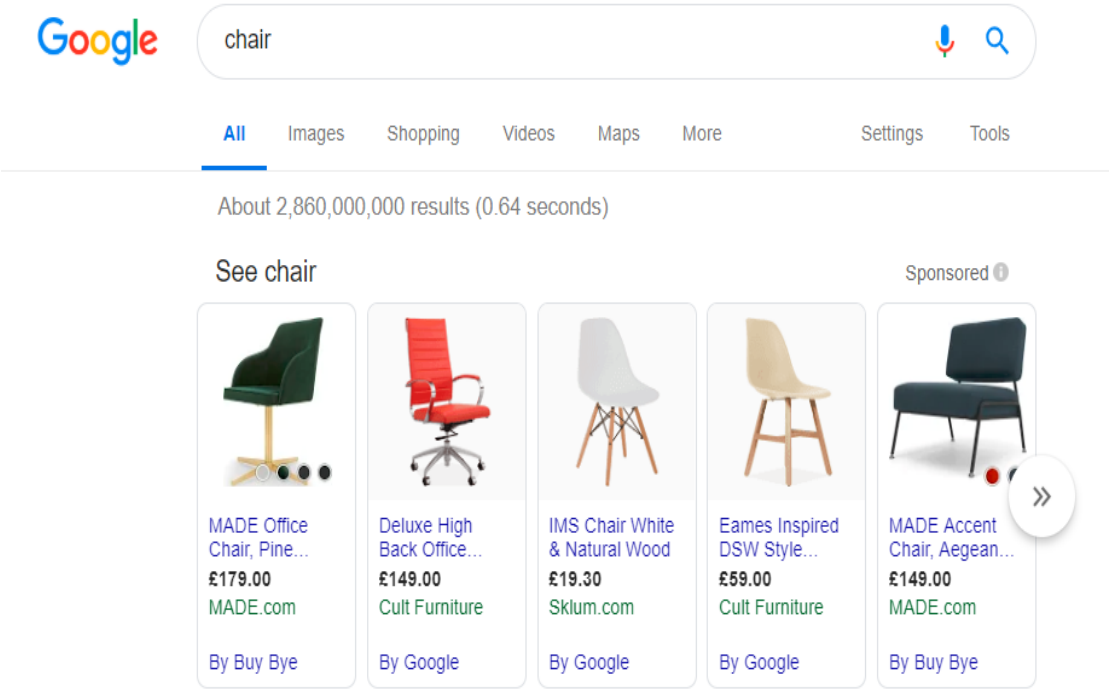

Figure 3.2 Displaying ‘paid’ advertising results

As the competitor of Google in China, the Baidu search engine has similar search functions, but not always label its paid links. Figure 3.3 shows part of searched results of the same key word ‘student storage’ as in Figure 3.1. In Figure 3.3, there are no clear marks or symbols to distinguish the sponsored links from other non-sponsored ones. Figure 3.4 shows part of searched results for the key word ‘chair’ as in Figure 3.2. The top two positions on the searched result list in Figure 3.4 were taken up by online dictionary functions and there are no clear indications or symbols to distinguish sponsored links and non-sponsored ones.

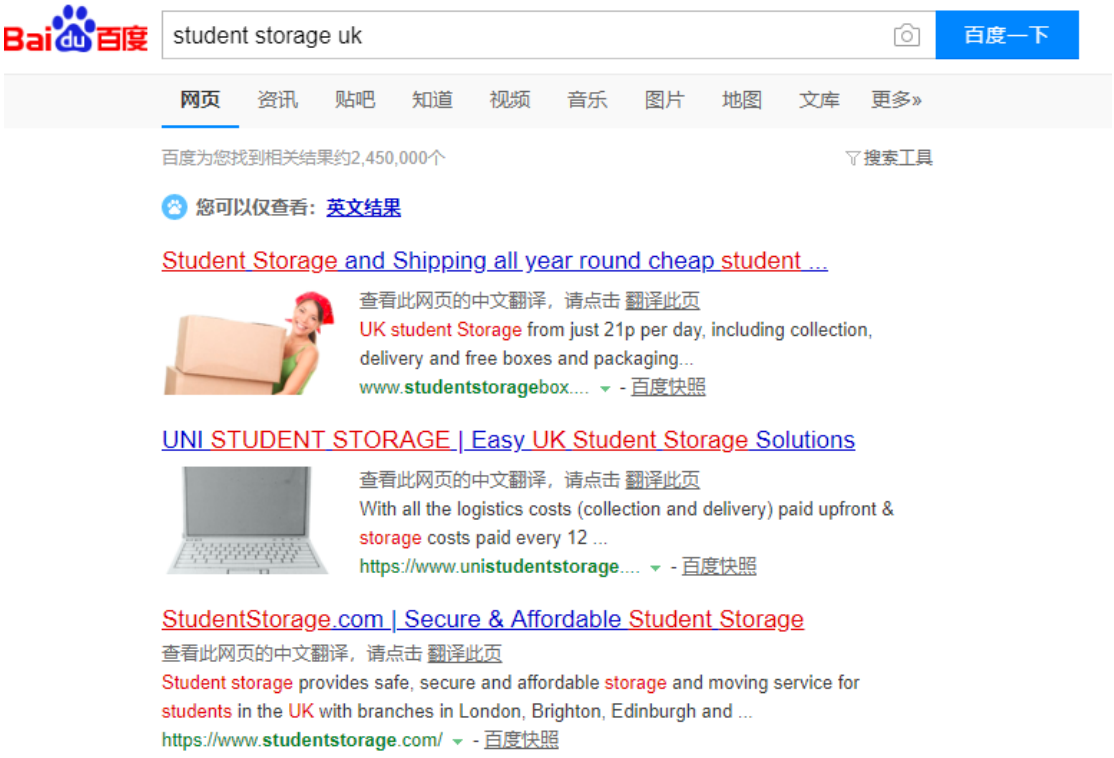

Figure 3.3 A search result for “student storage UK”in Baidu

Figure 3.4 A search result for “chair ”in Baidu

The Internet market in China has been growing rapidly and attracting numerous companies (Kshetri, 2017; Lai & To, 2012). By the end of 2017, China had 772 million Internet users (56% of the population) compared with 731 million users at the end of 2016 (CNNIC, 2018). In 2018, the Internet advertising makes 79.9 billion yuans (about 11.3 billion dollars), and takes about 31% of the advertising market (State Administration for Market Regulation, 2019).

In the Chinese Internet Market, there has been a fierce competition between international companies, like Google, and indigenous companies, like Baidu (Oh & Zhang, 2010). The Chinese government has imposed restrictions to the online information, which limited the development of foreign companies, and foreign companies have generally lost to indigenous companies in taking up a share of the Chinese market (Fallows, 2008; Yeo, 2016; Zheng, 2013).

Google and Baidu are the leading search engine companies worldwide and in mainland China, and the competition between them in the China market reflects the control of the government in China (Oh & Zhang, 2010; Yeo, 2016). In 2017, Google makes 95 billion dollars and has over 90% of the global market, and Baidu makes 13 billion dollars and has less than 1% of the global market. However, the situation has reversed in China, where Baidu takes about 70% and Google only takes 2% of the China search engine market in 2017 (StatCounter GlobalStats, 2017b, 2017c; Statista, 2019c, 2019d). This reverse situation in the China is mainly due to China government's Internet filtering system. As stated in Section 2.1.2, Chapter 2, Chinese government, controlling censorship and protectionism, launched the Internet filtering system, which designed to block what the government considers harmful or sensitive information from the Internet, such as the Golden Shield (Fallows, 2008; Zheng, 2013). Sensitive information, such as 'Tibet/Taiwan independence', will be filtered when searching online in China.

3.1.4 Children's awareness of advertising

3.1.4.1 Children's awareness of television advertising

As mentioned in Section 1.2, Chapter 1, research on children's advertising literacy focuses on children's recognition of advertising and understanding of advertising intents (Blades, Oates, & Li, 2013; Kunkel, 2010; Rozendaal, Buijzen, & Valkenburg, 2011). Researchers have indicated that children are able to recognize television advertisements by the age of 5 years, and show some understanding of the intent of television advertisements by the age of 8 years (Butt et al., 1981; Kunkel et al., 2004; Rozendaal, Buijzen, & Valkenburg, 2010; Stephens, Stutts, & Burdick, 1982). However, these findings do not apply to children's awareness of web advertising because Ali et al (2009) and Li et al (2014) find that children are unable to distinguish advertisements

on web pages until about the age of 10 years, and results of Study 1 show that only a minority of 8 to 14 year old children are able to understand the sponsor nature of search engine advertising in both China and the UK. In other words, the age when children can make awareness of online advertisements is much later than the age when children can make awareness television advertisements.

3.1.4.2 Children's awareness of web advertising

Compared with television advertising, web advertising can be less restrictive, more covert, more interactive, and can be presented simultaneously with the content using similar formats (e.g. picture/text). Web advertising has used attractive design in its formats, such as animation (Hamborg, Bruns, Ollermann, & Kaspar, 2012), location (Agarwal, Hosanagar, & Smith, 2011), size (Robinson, Wysocka, & Hand, 2007), the use of pictures (Hsieh & Chen, 2011) and the use of labels (e.g. 'ads') (Cai & Zhao, 2013). However, web advertising lacks distinct cues like television advertising, such as voiceovers, pacing, length, timing and separators (Ali et al., 2009; Nairn, 2008). Such characteristics of web advertising may increase the difficulty to differentiate advertisements from its web page content (Ali et al., 2009; Li et al., 2014).

Few researchers have examined children's ability to distinguish online advertisements (Ali et al., 2009; Li et al., 2014). Ali et al (2009) examined the ability of the UK and Indonesian children aged 6, 8 10 and 12 years and asked them to distinguish web advertisements on web pages. Ali et al found that the 6 year old children could recognize about one quarter, the 8 year old could recognize about a half, and the 10 and 12 year old children could recognize about three quarters of the advertisements.

In line with Ali et al's (2009) study, Li et al (2014) adopted Ali et al's method and examined Chinese children's ability to identify web advertisements. Li et al recruited

children aged 7, 9 and 11 years old, and found that children could identify most of the advertisements at 11 years of age. Both Ali et al and Li et al concluded that the developmental sequence of children's recognition of television advertising cannot be applied to children's awareness of web advertising. Children might not be able to distinguish online advertisements consistently until about 10 years of age, which is much later than they can recognize television advertising.

Children's awareness of television advertising has been investigated in many studies (Butter et al., 1981; Levin, Petros, & Petrella, 1982; Stephens, Stutts, & Burdick, 1982; Stutts, Vance, & Hudleson, 1981; Wilson & Weiss, 1992), but given the increase in and importance of web advertising more research is needed into children's awareness of such non-traditional advertising.

3.1.4.3 Children's awareness of search engine advertising

There has been only one previous study (Li et al., 2014) into children's awareness of search engine advertising. Study 2 adopted and modified Li et al's (2014) procedure to examine Chinese children's recognition of advertisements on search result pages. Based on Li et al's findings the first prediction was:

Prediction 1: Children would be able to distinguish between advertisements and the content on search engine web pages by 12 years of age.

As mentioned in Section 1.6.2.1, Chapter 1, children's attention can be influenced by different types of the presentation mode of advertising (picture-based/text-based), which might further affect their recognition of search engine advertisements. Previous research has shown that a picture-based message is more attractive and facilitates word recognition and comprehension for people with lower literacy skills, such as children

(Chau, Au, & Tam, 2000; Goodrick, 2011; Houts et al., 2006; Pieters & Wedel, 2004). If using the picture as the presentation mode supports the learning and comprehension, it might also play a role in affecting children's abilities to recognize the search engine advertising. Based on the previous research, the second prediction was:

Prediction 2: Picture-based advertisements on search engine results pages are easier for children to recognize than text-based advertisements.

3.2 Method

3.2.1 Participants

Data from Study 2 were collected between January to Feburary 2016 from 2 primary schools in Binzhou, Shandong province, China. A total of 128 children was recruited and they were randomly chosen based on their age and were divided into four age groups, the 6-year-olds (M = 6.28, SD = 0.46), 8-year-olds (M = 8.41, SD = 0.50), 10-year-olds (M = 10.25, SD = 0.47), and 12-year-olds (M = 12.31, SD = 0.46). In each age group, there were 32 children, half were girls and half were boys. This study received ethics approval from the Department of Psychology Ethics Sub-Committee at the University of Sheffield. Permissions were also obtained from the school headteacher, main class teachers and parents before conducting the study. The children were also asked if they were willing to take part on the day of the study.

Children were tested individually in a quiet room to avoid distraction. To avoid interrupting the children's normal study times, children were asked to take part in the study when they did not have key curriculum subjects such as Literature, Mathematics and English.

3.2.2 Materials

Children were asked a brief of pre-test questions to check their access and use of the television and the Internet. Children were also asked two questions about their awareness of television advertising and whether they had online experiences of using search engines (see Figure 3.5).

一．测试前的问题（有选项的，根据受试者的回答在选项后的括号内打√）/**Part 1 questions (Choose the right answer and put a check √ to that option)**:
1. 请问在家里会看电视吗？ **(Do you watch television at home?)**
回答 **(Answer)**：会 **yes** (　) 不会 **no** (　)
2. 之前在看电视时见过广告吗? **(Have you seen any advertisements on television?)**
回答 **(Answer)**：见过 **Have seen** (　) 没见过 **Have not seen** (　)
3. 能不能告诉我你最喜欢的电视广告？**(Please, can you tell me your favourite television advertisement?)**
回答 **(Answer):** 不能 **No, I cannot** (　)；能 **Yes, I can** (　)，最喜欢的广告是 **(My favourite advertisement is)** _____
4. 还能不能记得其他的电视广告呢？**(Can you remember any other television advertisement?)**
回答 **(Answer)**：不能 **No, I cannot** (　)；能 **Yes, I can** (　)，其他广告如 **(Other advertisement:)** _____
二．测试后的问题 **Part 2 questions**（有选项的，根据受试者的回答在选项后的括号内打√）：**(Choose the right answer and put a check in that option)**
5. 你家里有电脑吗？ **(Do you have a computer/laptop at home?)**
回答 **(Answer):** 有 **I do** (　) 没有 **I do not** (　)
6. 你在家里会用电脑吗? **(Do you use the Internet at home?)**
回答 **(Answer):** 会 **I do** (　) 不会 **I do not** (　)
7. 你大概在家多久用一次电脑呢？每次大概多少时间（分钟)? **(How often do you use the Internet at home? How many minutes every time you use the Internet?)**
回答 **(Answer)**: 每天 **every day** (　) 隔天 **every two day** (　) 每周 **every week** (　), 每次(　)分钟 (填写大概的时间) **About how many minutes every time?**
8. 你会不会使用网络搜索信息 (举出一个例子算会) **Do you search information using the Internet at home? (Could you give an example?)**
回答 **(Answer):** 会 **I do** (　), 举出的例子 **(Giving an example)**

不会 **I do not** ( )
9. 你知道如何使用电脑搜索信息吗? **(Do you know how to search information online?)**
回答 **(Answer):** 知道 **I know(**), 举出的例子 **(Giving an example)**: 不知道 **I do not know (**)
10. 你知道多少搜索引擎呢? 请标出你知道的所有搜索引擎 **(How many search engines do you know? Please label all search engines you know)**
回答 **(Answer):** _____个**(How many)** 百度**Baidu** 360奇虎**360 qihu** 搜狗**sougou** 谷歌 **google** **HK** 腾讯 **Tengxun** _____(其他搜索引擎)**(Other search engines)**
11. 你知道百度是如何进行搜索的吗 (举出一个例子) **(Do you know how Baidu works? Give one example)**
回答 **(Answer):** 知道 **I know(**), 举出的例子 **Giving example**: 不知道 **I do not know(**)
12. 你知道百度是在哪里得到你所需要信息的吗 (举出一个例子)? **(Where does Baidu get its information? Give one example)**
回答 **(Answer):** 知道 **I know (**), 举出的例子**(Giving example)**: 不知道 **I do not know (**)

Figure 3.5 Pre-test questions for Study 2.

There were four main parts of the invented search engine web pages, two parts contained text-based messages and the other two parts contained picture-based messages. Those messages were randomly laid out in the four main parts, not including the search bar. Each web page contained only one advertisement, half of them contained only one picture-based advertisement (see Figure 3.6 and 3.7), and the other half contained one text-based advertisement (see Figures 3.8 and 3.9).

According to Statcounter GlobalStats (2017a) the top four search engines in China were Baidu, Haosou 360, Sougou and Google China. Hence, the format of each invented search engine web page was matched to one of these four search engine websites (see Figure 3.10).

All the search engine advertisements were invented so children would not be familiar with them, and they were constructed following the advertisement formats on actual search engine web pages. Before the experiment, all 34 invented pages had been presented to a group of 10 adults and the adults had been asked to point out what they thought was an advertisement on each page. All the adults had correctly identified all the advertisements quickly. Hence, the invented search engine web pages looked similar to typical search engine advertisements from an adult Internet users' perspective. All 34 invented search engine web pages were randomly presented on a laptop screen.

Figure 3.6: Sample web page with one picture-based advertisement is highlighted in a red square (the square was not shown on the actual materials).

Figure 3.7: Sample web page with one picture-based advertisement is highlighted in a red square (the square was not shown on the actual materials).

Figure 3.8: Sample web page with one text-based advertisement is highlighted in a red square (the square was not shown on the actual materials).

Figure 3.9: Sample web page with one text-based advertisement is highlighted in a red square (the square was not shown on the actual materials).

Figure 3.10: original website labels and the modified labels used in Study 2

3.2.3 Procedure

The children carried out the experiment individually in a quiet room accompanied by one of their teachers and the experimenter. The teachers took no part in the experiment. During the procedure, young children could ask the experimenter to read the materials, including the pre-test questions and web pages, if they could not read. After the children had settled down, children were asked to fill in a brief of pre-test questions asking for their basic demographic information (age and gender) and their access and use of the

television and the Internet, and their knowledge about television advertising and their online experience (e.g. searching information online).

After the child finished the pre-test questions, he or she was shown the web page in a random order on a computer screen and asked to point to the part of the web page that they thought was an advertisement. To help children better understand the requirements, the child was presented with an example web page, which clearly labelled the four main parts of the web page with numbers (see Figure 3.11).

Figure 3.11: The sample page with numbers to label the positions on the web page.

Apart from the first sample page (see Figure 3.10), which had numbers and squares to indicate positions, the rest of invented web pages were presented without labels to ensure they were as similar as possible to real search engine web pages. In case children forgot the order of the four areas, the children were given a white piece of paper simply marked with the four areas of a web page, and they could ask the experimenter about the number of the four main areas during the task. After children pointed out one of the

four major areas, which they thought contained an advertisement, the experimenter recorded the number of the area which was pointed out (1-4). During the experiment, all of the 6-year-olds required help in reading the materials, the 8-year-olds asked help in reading sometimes, and the older children, aged 10- and 12-year-olds barely asked help in reading the materials.

3.3 Results

3.3.1 Pre-test questions

Table 3.1 shows how children knew about advertising based on their experience of watching television. Most children watched television at home and had seen advertising when they watched television. Half of the older children (10 and 12 year olds) could give correct examples of their favourite television advertisements, and they could also give correct examples of other television advertisements that they had seen.

Table 3.1: Percentage of children in each age group who gave appropriate responses to each item of the pre-test questions.

	6 years	**8 years**	**10 years**	**12 years**
Watch a television at home	96.9	100.0	100.0	100.0
Have seen television advertising before	96.9	100.0	100.0	100.0
Can give an example of one favourite television ads	15.6	18.8	68.8	84.4
Can give examples of other television ads	9.4	6.3	71.9	96.9

Tables 3.2 and 3.3 show children's use of the Internet and their knowledge of online search engines. Although most of the children had a computer at home, more of the

older children (aged 10 and 12 years) were able to use a computer at home than younger children (aged 6 and 8 years).

Table 3.2: Percentage of children in each group who had or used a computer, and mean number of hours spent online.

	6 years	8 years	10 years	12 years
Have a computer at home (%)	93.8	100.0	100.0	100.0
Have used a computer at home (%)	0.0	3.1	87.5	93.8
Mean time (hours) spent online in a typical day reported by children	0.85	1.08	0.60	0.99

Table 3.3: Percentage of children in each group who searched with a computer, and the mean number of known search engines.

	6 years	8 years	10 years	12 years
Have searched information online (%)	0.0	0.0	12.5	6.3
Mean number of known search engines	0.47	1.03	2.84	3.66

3.3.2 Children's performance in search engine advertising recognition task

In the recognition task the children were scored as correct if they correctly identified where the advertisement was on the web page. Tables 3.4 and 3.5 show the mean number and percentage of advertisements recognized by each age group. As there were four parts in the main area of the invented search engine web page, the chance at which children randomly guessed the correct part was one in four (25%). The younger children (6 year olds and 8 year olds) identified a quarter of the advertisements, 10-year-olds recognized nearly three-quarters of the advertisements and the 12-year-olds recognized most of the search engine advertisements.

Table 3.4: The mean number of correctly recognized advertisements for each group and for each type of advertisement.

	Picture-based ads (max score 17)	Text-based ads (max score 17)	All advertisements (max score 34)
6-yr-olds	4.50	3.47	7.97
8-yr-olds	4.72	3.91	8.63
10-yr-olds	13.16	10.53	23.69
12-yr-olds	15.63	15.50	31.12

Table 3.5: The percentage of correctly recognized advertisements for each group and for each type of advertisement.

	Picture-based ads (max score 17)	Text-based ads (max score 17)	All advertisements (max score 34)
6-yr-olds	26.5%	20.4%	23.4%
8-yr-olds	27.8%	23.0%	25.4%
10-yr-olds	77.4%	61.9%	69.7%
12-yr-olds	91.9%	91.2%	91.6%

A normality test, the Kolmogorov-Smirnov test, showed that none of the dependent variables were normally distributed, for the number of correctly recognized search engine advertisements, $D(128) = 0.21$, $p < .001$, for the number of correctly recognized picture-based search engine advertisements, $D(128) = 0.17$, $p < .001$, and for the number of correctly recognized text-based search engine advertisements, $D(128) = 0.14$, $p < .001$. Therefore, non-parametric tests were used for the data analysis.

A Kruskal-Wallis test was used to compare performance between the age groups. Results showed significant differences across four age groups for the number of correctly recognized search engine advertisements, χ^2 (3) = 99.95, $p < .001$, for the number of correctly recognized picture-based search engine advertisements, χ^2 (3) = 96.26, $p < .001$, and for the number of correctly recognized text-based search engine advertisements, χ^2 (3) = 89.35, $p < .001$.

Mann-Whitney tests were used to follow up these findings. A Bonferroni correction was applied to control for Type 1 errors, and all effects are reported at a 0.05/4 = 0.0125 level of significance. For performance in recognizing all search engine advertisements, the 6-year-olds were not significantly different from 8-year-olds, U=418, r=-.16, p>.0125, but significantly poorer than 10-year-olds, U=14.0, r=-.84, p<.0125, and 12-year-olds, U<.001, r=-.86, p<.0125. The performance of 8-year-olds was significantly poorer than the 10-year-olds, U=18.5, r=-.83, p<.0125, and the 12-year-olds, U<.001, r=-.86, p<.0125. The performance of 10-year-olds was also significantly poorer than the 12-year-olds, U=138.5, r=-.63, p<.0125.

For recognizing picture-based search engine advertisements, the 6-year-olds were not significantly different from 8-year-olds, U=475.5, r=-.06, p>.0125, but were poorer than 10-year-olds, U=22.5, r=-.82, p<.0125, and much poorer than the 12-year-olds, U<.001, r=-.87, p<.0125. The performance of 8-year-olds was significantly poorer than the 10-year-olds, U=23.5, r=-.82, p<.0125, and the 12-year-olds, U<.001, r=-.87, p<.0125. The performance of 10-year-olds was also significantly poorer than the 12-year-olds, U=222.5, r=-.49, p<.0125.

For recognizing text-based search engine advertisements, the 6-year-olds did not differ from 8-year-olds, U=456.0, r=-.10, p>.0125, but were significantly poorer than 10-year-olds, U=87.5, r=-.71, p<.0125, and very significantly poorer than 12-year-olds, U<.001, r=-.87, p<.0125. The performance of 8-year-olds was significantly poorer than the 10-year-olds, U=98.0, r=-.70, p<.0125, and the 12-year-olds, U<.001, r=-.87, p<.0125. The performance of 10-year-olds was also significantly poorer than the 12-year-olds, U=138.5, r=-.63, p<.0125.

To investigate whether there was a difference in the number of correctly recognized picture-based and text-based search engine advertisements, a Wilcoxon test was applied.

There was a significant difference between the number of correctly recognized two types of search engine advertisements, $z=-3.23$, $p<.01$, $r=-.20$, and the picture-based advertisements were identified better. Comparing the performance between the number of correctly recognized two types of search engine advertisements for each age group showed that there was no difference between the accuracy of recognizing two types of advertisements for the 6-year-olds, $z=-1.32$, $p>.05$, $r=-.17$, for the 8-year-olds, $z=-0.91$, $p>.05$, $r=-.11$, or for the 12-year-olds, $z=-0.40$, $p>.05$, $r=-.05$. While the 10-year-olds performed significantly better at recognizing picture-based search engine advertisements than text-based search engine advertisements, $z=-3.95$, $p<.001$, $r=-.49$. Hence, the significant difference reported for picture-based advertisements was due to the better performance of the 10-year-olds.

3.4 Discussion

3.4.1 Children's performance in search engine advertising recognition task

Study 2 examined the ability to recognize search engine advertising among a group of Chinese children, and found the 6- and 8-year-old children could identify about one quarter, the 10-year-olds could identify about three-quarters, the 12-year-olds could identify most of the search engine advertisements. As adults could identify all of the search engine advertisements, results indicated that children could not reach adult-like recognition of search engine advertising even at their 12 years old. Study 2 also confirms children's abilities to recognize picture-based and text-based search engine advertising develop with age. Hence, the results demonstrated an improvement in children's ability to recognize advertisements, including picture-based and text-based, on search engine results pages with increasing age, and this finding was in line with prediction 1, which was based on previous research about search engine advertisements (Li et al., 2014). The similarity in the findings from a non-Western country suggests

that the age related development in the recognition of search engine advertisements is likely to be more universal rather than culturally specific.

As mentioned in Section 1.6.2.3, Chapter 1, children develop the abilities to recognize web advertising from its content from 9 to 10 years old (Ali et al., 2009; Li et al., 2014). Findings in Study 2 showed that children's ability to identify advertisements on the search engine output pages greatly developed at 10 years old, which also in line with Ali et al and Li et al's research findings. The age that children could recognize web advertising, including the search engine advertising, was much later than the age children could recognize television advertisements (Kunkel et al., 2004). Hence, the conclusions drawn about the age when children can recognize television advertisements might not apply to children's recognition of search engine advertising.

The later development of children's ability to recognize search engine advertising than television advertising might be due to three major reasons.

First, children's immature cognitive skills might restrict their ability to recognize the search engine advertising than the television advertising. As discussed in section 3.1.5, children's low-level literacy, lack of content knowledge and limited knowledge to refine searches hamper children's effectiveness at searching information online (Bilal, 2000, 2001, 2002; Madden et al., 2006). In terms of children's reading ability, the youngest children had the experimenter read to them, which made the experiment become an oral language test for them. The older children, aged 10- and 12-year-olds, were less likely to require reading help as they were skilled readers and could fluently decode the written messages. While the 8-year-olds might be in the process of becoming skilled readers, and they only asked for reading help if necessary. As mentioned in Section 1.4.5, Chapter 1, the LCMP model and the PCMC model suggest children's

underdeveloped cognitive skills make children hardly to balance the allocated resources and required resources for processing the commercial content (Buijzen, et al., 2010; Lang, 2000). Applied to the results of Study 2, processing both picture and text messages might overload children's limited cognitive abilities, and increase children's difficulty in evaluating the search engine web page and in distinguishing the search engine advertising from its content.

Second, previous research has indicated there are age-indirect-associated factors, such as children's previous online experience, guidance from adults/peers, and their ability to explore the environment (e.g. adequate vocabulary and content knowledge) which affect children's success at online information searching tasks (Bilal, 2000, 2001, 2002; Madden et al., 2006). Children might be more familiar with television advertising than the search engine advertising. As mentioned in Sections 1.8.1 and 1.8.2, Chapter 1, the television has higher penetration than the Internet in China, children might accumulate comparatively more experience using the television than using the Internet. Results from Study 1 questionnaire and Study 2 pre-test questions showed that almost all the children had access to their home television, but only few of the younger children (aged 6 and 8 year olds) had used a computer at home or searched online. In contrast, most of the older children (the 10 and 12 year olds) had used a computer at home and had searched online. Older children may have accumulated more knowledge and experience of searching information online, and they might be more familiar with search engine advertisements than younger children. Whether there is a relationship between previous online searching experiences and recognizing web based advertisements is an issue that requires further research.

Third, children's skills of processing television advertising could not apply to process the search engine advertising due to the different formats (Li et al., 2014). Traditional television advertising is usually presented as short broadcasts, characterised by

voiceovers, pacing, timing and separators (Ali et al., 2009; Nairn, 2008). Children can use the perceptual features, such as voice and length of segment to distinguish the television advertising and programmes (Blosser & Robert, 1985; Butter et al., 1981; Levin, Petros, & Petrella, 1982). However, search engine advertising, as a covert advertising format without reliable characteristic cues like television advertising (e.g. separators), might also increase the difficulty for children to differentiate the search engine advertising from its content (Li et al., 2014). Hence, a higher level of cognitive skills may be required for children to identify search engine advertising from its content.

3.4.2 Different presentation mode effects on children's performance in search engine advertisements recognition task

Study 2 also investigated the influence of different advertising presentation modes, picture-based or text-based, on children's performance in the advertising recognition task. Previous research has indicated that picture-based presentation mode is more attractive than text-based presentation mode for children who generally have lower literacy skills (Goodrick, 2011; Houts et al., 2006; Pieters & Wedel, 2004). However, after comparing children's accuracy of recognition between picture-based and text-based search engine advertising, only the 10-year-olds performed significantly better in recognizing the picture-based advertisements, and there was no significant difference found in the other three age groups. Hence, the prediction, children would perform better in recognizing picture-based advertisements, was only weakly supported.

For the lack of difference between recognizing picture-based advertisements and text-based advertisements, the two younger groups (the 6- and 8-year-olds) performed at the chance level. According to the PCMC model (Buijzen, et al., 2010) children's information processing skills are still underdeveloped in their middle childhood (6 to 9 years old), and children at this stage till have difficulties to recognize web

advertisements even with cues (Ali et al., 2009). Hence, it can be assumed those younger Chinese children, aged 6 and 8 years old, might only guess when they responded and this would reduce the likelihood of finding differences between picture-based and text-based advertising in the younger age groups.

The 10-year-olds performed significantly better in recognizing the picture-based advertisements than the text-based advertisements. According to the PCMC model (Buijzen, et al., 2010) children in their later childhood (10 to 12 years old) develop a higher level of cognitive kills and are assumed to systematically evaluate advertising information (Valkenburg & Cantor, 2000; Valkenburg, 2004). But being at the starting point of the later childhood, the 10-year-olds might still rely on more heuristic cues such as preferred images (e.g. preferred pictures/characters), than the 12-year-olds (Buijzen et al., 2010).

For the 12-year-olds, there was also no significant difference in recognizing the picture-based advertisements and text-based advertisements. According to the central-incidental learning paradigm (Roedder, 1981), the 12-year-olds, as strategic processors, are able to distinguish the central and incidental message and selectively process the central message. Applied to the results of Study 2, the 12-year-olds might have been more able to focus on the content of search engine advertising and the rest of the search engine web pages, and paid less attention to the delivered format (picture/text). Compared with younger children, children at 12 years of age are assumed to recognize television advertising like adults, and have an awareness of the advertising intent (Rozendaal, Buijzen, & Valkenburg, 2010), although the relationship between recognizing and understanding advertisements on search engine pages is an issue that requires further investigation.

Previous research showed that children start to recognize the web advertisements from 9 to 10 years old (Ali et al., 2009; Li et al. 2014). The older children, the 10- and 12-year olds, in Study 2 showed a little better performance than the older children in Li et al's study. One reason might have been the different page design because if the older children sometimes guessed a response they had a higher chance of being correct in Study 2 than in Li et al.

In conclusion, children's abilities to recognize search engine advertisements develop with age, and children can recognize most search engine advertisements by the age of about 12 years old, which is much later than the age that they can distinguish television advertising. A significant difference between the accuracy of recognizing picture-based advertising and text-based advertising was only found in the 10-year-olds, which indicated that the presentation mode only had limited effects on children's recognition of search engine advertising. In China there is a rural-urban disparity in resources and a digital divide, which has been associated with children's academic performance, their abilities to learn, communicate and explore in a digital environment (Chan & McNeal, 2006a; Li, 2019; Li & Ranieri, 2013). Therefore the children's performance in Study 2 might not have been typical of all children in China. It is possible that children in urban areas would perform better at the task of the search engine recognition in Study 2. To investigate this, Study 3 (in chapter 4) was conducted in an urban primary school in China.

CHAPTER 4

4. STUDY 3: CHINESE URBAN CHILDREN'S ABILITY TO IDENTIFY SEARCH ENGINE ADVERTISEMENTS

4.1 Introduction

The results of Study 2 showed that Chinese children could only consistently identify most of the search engine advertisements by about 12 years of age. But the children in Study 2 were all recruited from rural schools in China and previous research indicated that there might be a 'digital divide' between urban and rural China (Chan & Cai, 2009; Chan & McNeal, 2006b, 2006c, 2007). The digital divide is explained below (section 4.1.1). Such a divide may mean that children in rural areas have less access to new technologies and so the children in Study 2 may not have performed as well as other children in China. Therefore, Study 3 was carried out as Study 2 with a second group of children who were recruited from an urban area. This allowed not only to investigate Chinese urban children's ability to identify search engine advertisements, but also to examine whether children in a different area of China performed differently.

4.1.1 The digital divide

The digital divide refers to the gap between those who have and those who do not have easy access to Information Communication Technologies (ICTs), such as the Internet (OECD, 2001). The divide can be made up of many factors at both the macro or micro level. For the macro perspective, factors contributing to the digital divide include differences between nations, including the economic level of the country, citizens' attitude to new technologies and the policy environment (Chinn & Fairlie, 2007; Hargittai, 1999). From the micro perspective, factors contributing to the digital

divide include differences in age (Loges & Jung, 2001), gender (Drabowicz, 2014), location (urban/rural area) (Li & Rainier, 2013; Liao et al., 2016), race (Jackson et al., 2008), social support (Chen, 2013) and the income level (Mossberger et al., 2008). Previous research conducted in Western countries has demonstrated white males, in urban areas, who have higher levels of education and income are usually easier to accumulate ICT related experience and have superiority in the area of ICTs (Gilbert, 2010; Mossberger et al., 2006, 2008).

Children's digital usage, especially Internet access and use, is an important issue as ICTs related skills are necessary for children's education, and for later life and future employment (Koss, 2001). Based on this view, children who have less access to digital resources and/or less experience of using such resources may become a disadvantage (Kumar & Kumara, 2018). Kumar and Kumara (2018) examined the frequency, place and purpose of urban and rural students' use of computers in India. They found that lower availability of computers was the main reason for the lower percentage of rural students who used a computer compared to urban students. Rural students were more likely to use a computer for non-academic activities (e.g. play online games), while urban students used computers for academic work. Kumar and Kumara suggested that a computer was necessary for contemporary students as it not only to aid students' studies, but also to expand and update students' knowledge. Such a digital divide between urban and rural children may be intensified when there is a major disparity between urban and rural areas as in countries like India and in China, while the divide will be less evident or disappear if there is little or no rural-urban disparity as in the UK. In 2018, super-fast broadband covered 94% of UK homes and businesses, which indicates there is almost no Internet access urban-rural disparity in the UK (Ofcom, 2018b).

4.1.2 The digital divide in China

There has been a lower level of economy and education in rural areas than urban areas in China, which result in children's digital inequality and increasing rural-urban disparity in the economy and education (Chan & McNeal, 2006a, Li & Ranieri, 2013; Wang, 2013; Liao et al., 2016). Li and Ranieri (2013) observed the digital inequalities implications for social development and education. They measured five Internet-inequality indicators which involve inequalities in the hardware, autonomy of use, social support, Internet use and Internet self-efficacy. Li and Ranieri examined children aged 10 to 14 years from one rural school and two urban schools in Hangzhou, Zhejiang Province. As predicted, the urban children scored higher on all measured Internet-inequality indicators. Li and Raineri found that teachers, rather than parents, had a positive influence on students' online behaviour, and the educational level of parents positively affected the inequality-indicators. Li and Ranieri also found that the students' Internet self-efficacy was correlated to their online exploring behaviours and their academic performance.

Liao et al (2016) investigated rural-urban digital inequality in Taiwan. They targeted elementary and junior school students. Liao et al found that, the number of computers in homes and schools, Internet availability at home, the educational level of the mother and the number of weekly computer lessons all played a role in rural-urban digital inequality.

The rural-urban Internet-inequality has also been reported in a series of Chinese national surveys conducted by CNNIC. Three-quarters of Chinese Internet users were from urban areas and only one-quarter from rural areas in the CNNIC report (CNNIC, 2018). The Young Adult Online Behaviour Report (2016) also showed similar

proportions with three-quarters of 6- to 24-year-olds being from urban and one-quarter from rural areas.

Study 3 replicated Study 2's method and used the same materials, but with an urban sample. Hence, children in Study 3 (the urban sample) were expected to identify search engine advertising better than the rural children in Study 2. In other words, the urban sample might recognize search engine advertisements at an earlier age than did the rural children in Study 2.

Prediction 1: children in an urban area of China will recognize search engine advertising at an earlier age than children from a rural area.

All materials used in Study 3 were exactly the same as in Study 2. Study 3 also included search engine advertisements that were picture-based or text-based. As mentioned in Section 1.6.2.1, Chapter 1, using the picture as the presentation mode is more attractive, and better for children's learning and comprehension than a text-based presentation mode (Chau, Au, & Tam, 2000; Goodrick, 2011; Houts et al., 2006; Pieters & Wedel, 2004). However, our second prediction in Study 2 (that picture-based advertisements on search engine result pages would be easier for children to recognize than text-based advertisements) was only weakly supported, because the results of Study 2 showed that only the 10-year-olds performed better in recognizing picture-based advertising than the text-based advertising. In Study 3 therefore, we did not expect there to be major differences in the recognition of picture-based and text-based search engine advertisements and did not make a specific prediction.

4.2 Method

4.2.1 Participants

Data from Study 3 were collected from an urban primary school in Yantai, Shandong province, China, from January to March 2017. There were 128 children in four age groups, the 6-year-olds (M = 6.38, SD = 0.49), the 8-year-olds (M = 8.41, SD = 0.50), the 10-year-olds (M = 10.25, SD = 0.44), and the 12-year-olds (M = 12.28, SD = 0.46). All testing materials and the experiment procedure were exactly the same as for Study 2 (see pages 116-123), and children could have the experimenter read the materials for them if they could not read. Similar to Study 2, all of the 6-year-olds required help in reading the materials, the 8-year-olds asked help in reading sometimes, but the older children, aged 10- and 12-year-olds, rarely asked for help in reading the materials.

Study 3 received ethics approval from the Department of Psychology Ethics Sub-Committee at the University of Sheffield. Permission was also obtained from the school headteacher, the main class teachers and the children's parents before conducting the study. The children were also asked if they were willing to take part on the day of the study.

4.3 Results

4.3.1 Pre-test questions

Table 4.1a shows what Chinese urban children knew about advertising based on their previous television-watching experience. Most Chinese urban children watched television at home and had seen television advertising when they watched television. Over 60% of Chinese urban children in each age group could give correct examples of their favourite television advertisements, and over 80% in each age group could give correct examples of other television advertisements that they had seen. To better show the comparison between Chinese urban and rural children's knowledge about advertising, Table 4.1b, exactly like the Table 3.1 from Study 2, shows what Chinese rural children knew about advertising based on their experience of watching television.

There was not much difference between Chinese urban and rural children's television advertising watching experience, but more younger urban children, aged 6 and 8 years old, could give correct examples of their favourite and other television advertising.

Table 4.1a Percentage of Chinese urban children in each age group who gave an appropriate response to each item of the pre-test questions.

	6 years	**8 years**	**10 years**	**12 years**
Watch a television at home	96.9	90.6	87.5	90.6
Have seen television advertising before	96.9	90.6	100.0	96.9
Can give an example of one favourite television ads	65.6	84.4	65.6	78.1
Can give examples of other television ads	87.5	81.3	81.0	90.6

Table 4.1b Percentage of Chinese rural children in each age group who gave an appropriate response to each item of the pre-test questions.

	6 years	**8 years**	**10 years**	**12 years**
Watch a television at home	96.9	100.0	100.0	100.0
Have seen television advertising before	96.9	100.0	100.0	100.0
Can give an example of one favourite television ads	15.6	18.8	68.8	84.4
Can give examples of other television ads	9.4	6.3	71.9	96.9

Tables 4.2a shows Chinese urban children's use of the Internet. Most Chinese urban children had a computer at home and about three quarters of the children in each age group could use the computer at home. Table 4.2b is like Table 3.2, which shows Chinese rural children's use of the Internet. There was not much difference of children's

access to a computer at home and their time spent online, while younger urban children, aged 6 and 8 years old, were more likely to have access of a computer at home than rural peers.

Table 4.2a: Percentage of Chinese urban children in each group who had or used a computer, and the mean number of hours spent online.

	6 years	**8 years**	**10 years**	**12 years**
Have a computer at home (%)	90.6	96.9	100.0	87.5
Have used a computer at home (%)	71.9	75.0	96.9	81.3
Mean time (hours) spent online in a typical day reported by children	0.73	0.93	0.60	1.05

Table 4.2b: Percentage of Chinese rural children in each group who had or used a computer, and mean number of hours spent online.

	6 years	**8 years**	**10 years**	**12 years**
Have a computer at home (%)	93.8	100.0	100.0	100.0
Have used a computer at home (%)	0.0	3.1	87.5	93.8
Mean time (hours) spent online in a typical day reported by children	0.85	1.08	0.60	0.99

Table 4.3a shows Chinese urban children's previous online search experience and their basic knowledge of search engines. Table 4.3b is the same as the Table 3.3 from Study 2, which shows Chinese rural children's previous online search experience and their knowledge of search engines. There was not much difference in the number of known search engines between urban and rural groups. Compared with rural children, urban children were more likely to have online search experience.

Table 4.3a: Percentage of Chinese urban children in each group who searched with a computer, and the mean number of known search engines.

	6 years	8 years	10 years	12 years
Have searched information online (%)	3.1	9.4	59.4	28.1
Mean number of known search engines	1.81	2.31	3.13	3.28

Table 4.3b: Percentage of Chinese rural children in each group who searched with a computer, and the mean number of known search engines.

	6 years	8 years	10 years	12 years
Have searched information online (%)	0.0	0.0	12.5	6.3
Mean number of known search engines	0.47	1.03	2.84	3.66

4.3.2 Children's performance in search engine advertising recognition task

The children were scored as correct in the recognition task if they correctly identified where the advertisement was on the web page. Table 4.4 and Table 4.5 shows the mean number and the percentage of advertisements recognized by each age group from the Chinese urban sample. As there were four parts in the main area of the search engine web pages, and therefore the chance of children being correct by guessing was one in four (25%). The 6-year-olds could recognize about a quarter of the advertisements, the 8-year-olds could recognize nearly a half, the 10-year-olds could recognize about three-quarters and the 12-year-olds could recognize most of the advertisements. Table 4.4b and 4.5b are the same as Table 3.4 from Study 2, which show the mean number and the percentage of advertisements recognized by each age group in the Chinese rural sample. The statistical comparison results were discussed in Section 4.3.3.

Table 4.4a: The mean number of correctly recognized search engine advertisements for each group from the Chinese urban sample and for each type of advertisement.

	Picture-based ads (max score 17)	Text-based ads (max score 17)	All advertisements (max score 34)
6-yr-olds	5.53	4.03	9.56
8-yr-olds	9.25	5.88	15.13
10-yr-olds	12.66	12.97	25.63
12-yr-olds	15.34	15.56	30.91

Table 4.4b: The mean number of correctly recognized advertisements for each group of the Chinese rural sample and for each type of advertisement.

	Picture-based ads (max score 17)	Text-based ads (max score 17)	All advertisements (max score 34)
6-yr-olds	4.50	3.47	7.97
8-yr-olds	4.72	3.91	8.63
10-yr-olds	13.16	10.53	23.69
12-yr-olds	15.63	15.50	31.12

Table 4.5a: The percentage of correctly recognized search engine advertisements for each group of the Chinese urban sample and for each type of advertisement.

	Picture-based ads (max score 17)	Text-based ads (max score 17)	All advertisements (max score 34)
6-yr-olds	32.5%	23.7%	28.1%
8-yr-olds	54.4%	34.6%	44.5%
10-yr-olds	74.5%	76.3%	75.4%
12-yr-olds	90.3%	91.5%	90.9%

Table 4.5b: The percentage of correctly recognized advertisements for each group of the Chinese rural sample and for each type of advertisement.

	Picture-based ads (max score 17)	Text-based ads (max score 17)	All advertisements (max score 34)
6-yr-olds	26.5%	20.4%	23.4%
8-yr-olds	27.8%	23.0%	25.4%
10-yr-olds	77.4%	61.9%	69.7%
12-yr-olds	91.9%	91.2%	91.6%

The Kolmogorov-Smirnov test, a normality test, showed that none of the dependent variables were normally distributed: for the number of correctly recognized search engine advertisements, $D(128) = 0.16$, $p < .001$; for the number of correctly recognized picture-based search engine advertisements, $D(128) = 0.15$, $p < .001$, and for the number of correct recognized text-based search engine advertisements, $D(128) = 0.19$, $p < .001$. Hence, non-parametric tests were used for the data analysis.

A Kruskal-Wallis test was used to compare performance between the age groups. There were significant differences across the four age groups for the number of correctly recognized search engine advertisements, χ^2 (3) = 85.55, $p < .001$, for the number of correctly recognized picture-based search engine advertisements, χ^2 (3) = 82.04, $p < .001$, and for the accuracy of recognizing text-based search engine advertisements, χ^2 (3) = 81.10, $p < .001$.

Mann-Whitney tests were used to follow up these findings. A Bonferroni correction was applied to control for Type 1 errors, all effects are reported at a 0.05/4 = 0.0125 level of significance. For recognizing all search engine advertisements, the 6-year-olds were significantly poorer than the 8-year-olds, U=224.0, r=-.49, p<.0125, than the 10-year-olds, U=69.5, r=-.74, p<.0125, and very significantly poorer than the 12-year-olds, U<.001, r=-.86, p<.0125. The performance of 8-year-olds was significantly poorer than the 10-year-olds, U=18.5, r=-.61, p<.0125, and the 12-year-olds, U=19.0, r=-.83, p<.0125. The performance of the 10-year-olds was significantly poorer than 12-year-olds, U=256.0, r=-.43, p<.0125.

For recognizing picture-based search engine advertisements, the 6-year-olds were poorer than the 8-year-olds, U=203.5, r=-.52, p<.0125, the 10-year-olds, U=64.0, r=-.75, p<.0125, and the 12-year-olds, U<.001, r=-.86, p<.0125. The performance of the 8-

year-olds was poorer than the 10-year-olds, U=241.0, r=-.46, p<.0125, and the 12-year-olds, U= 36.5, r=-.80, p<.0125. The performance of 10-year-olds was poorer than the 12-year-olds, U=238.5, r=-.47, p<.0125.

For recognizing text-based search engine advertisements, the 6-year-olds did not differ from the 8-year-olds, U=415.5, r=-.16, p>.0125, but were poorer than 10-year-olds, U=66.0, r=-.75, p<.0125, and much poorer than the 12-year-olds, U<.001, r=-.87, p<.0125. The performance of urban 8-year-olds was poorer than 10-year-olds, U=129.5, r=-.64, p<.0125, and the 12-year-olds, U= 19.0, r=-.83, p<.0125. The performance of 10-year-olds did differ from the 12-year-olds, U=334.0, r=-.31, p<.0125.

To investigate whether there was a difference in the number of correctly recognized picture-based and text-based advertisements, a Wilcoxon test was applied. Overall, there was a significant difference between the accuracy of recognizing advertisements, z=-3.16, p<.05, r=-.20, and the picture based advertisements were identified better. Picture-based advertisements were better recognized than the text-based advertisements by the 6-year-olds, z=-2.89, p<.05, r=-.36, and by the 8-year-olds, z=-3.43, p<.05, r=-.43, but there was no difference for the 10-year-olds, z=-0.84, p>.05, r=-.11, or the 12-year-olds, z=-0.76, p>.05, r=-.10. Hence, the significant difference reported for picture-based advertisements was due to the better performance of the younger children (the 6-year-olds and the 8-year-olds).

4.3.3 Comparison between rural children's performance (from Study 2) and urban children's performance in the search engine advertising recognition task

A Kolmogorov-Smirnov test showed that none of the dependent variables were normally distributed: for the number of correctly recognized search engine advertisements, $D(256) = 0.18$, $p < .001$; for the number of correctly recognized picture-

based search engine advertisements, $D(256) = 0.16$, $p < .001$, and for the number of correctly recognized text-based search engine advertisements, $D(256) = 0.16$, $p < .001$. Therefore, non-parametric tests were used for the analysis.

A Mann-Whitney test was used and a Bonferroni correction was applied to control for Type 1 errors, so all effects are reported at a 0.05/2 = 0.025 level of significance. The urban 6-year-olds were performed significantly better than the rural 6-year-olds, U=332.0, r=-.32, p<.01, and the urban 8-year-olds performed significantly better than the rural 8-year-olds U=174.0, r=-.57, p<.001. While the performance of urban 10-year-olds did not differ from the rural 10-year-olds, U=390.0, r=-.21, p>.025, and the performance of urban 12-year-olds did not differ from the rural 12-year-olds, U= 449.0, r= -.11, p>.025.

For recognizing picture-based advertisements, the urban 8-year-olds were significantly better than the rural 8-year-olds U=153.5, r=-.60, p<.001. But the performance of the urban children did not differ from the rural children for any of the other age groups: 6-year-olds, U=355.5, r=-.27, p>.025; 10-year-olds, U=472.5, r=-.07, p>.025, and 12-year-olds, U= 428.0, r= -.15, p>.025.

In recognizing text-based advertisements, the urban 10-year-olds performed significantly better than the rural 10-year-olds, U=316.0, r=-.33, p<.025. But there were no differences between the other age groups: 6-year-olds, U=454.0, r=-.10, p>.025; 8-year-olds, U=392.0, r=-.20, p>.025, and 12-year-olds, U=493.5, r=-.03, p>.025.

4.4 Discussion

Study 3 investigated the ability to recognize search engine advertising among a group of Chinese urban children. The 6-year-olds could recognize about a quarter of the

advertisements, the 8-year-olds could recognize nearly half, the 10-year-olds could recognize three-quarters, and the 12-year-olds could recognize most of the search engine advertisements. The results showed an improvement in in the ability to recognize advertisements on search engine results pages with increasing age, and children had developed the ability to recognize most search engine advertising by the age of 12 years. This finding was similar to the results of Study 2.

The 6- and 8-year-olds in the urban sample did perform better than the rural children in the equivalent age groups. This could be evidence that, at least for the younger two age groups there was a digital divide, but that divide had disappeared by the age of 10 years because there were no differences between the urban and rural groups for the 10- and 12-year-olds. However, differences between the urban and rural groups for the 6-year-olds need to be treated with caution because the performance of this age group was about the level of chance in both Studies 2 and 3. Therefore, any differences between the urban and rural 6-year-olds may be spurious. As stated in Section 3.4.1, children's reading ability might also play a role in affecting children's recognition of search engine advertising, as the experiment was more oral based for the youngest children, the older children, aged 10- and 12-year-olds, could fluently decode the written advertising messages, while the 8-year-olds struggled to extract messages from the web pages as they only asked reading help if necessary. Recent Chinese research indicated that the urban children might receive more training that benefited their reading ability development, including better education in school and more reading books at home, than their peers in the rural area (Li, 2019). Hence, the 8-year-old urban children performed much better than the 8-year-old rural children, which might have been due to the different development in their reading ability.

The pre-test question results should be treated with caution because they were self-reports collected from children, and a comparison of the pre-test question results from

Study 2 and Study 3, did not indicate urban-rural differences in children's access to computers, or in children's time spent online. In other words, the pre-test question responses did not provide evidence to support an urban-rural digital divide.

Study 3 also compared urban and rural Chinese children's performance in recognizing picture-based and text-based search engine advertising. Results showed that the better picture-based search engine advertising recognition in urban children than rural children was only found in the 8-year-olds, and the better text-based search engine advertising recognition in urban children than rural children was only found in the 10-year-olds. Hence, the digital divide might not be the major factor that affected children's recognition of picture and text-based search engine advertising. One possible reason is that other factors, such as parents' monitoring of children's exposure to search engine advertising, and school's education quality disparity might also affect children's recognition of both types of search engine advertising. Further studies could take other potential factors into account to investigate differences between urban and rural Chinese children.

In conclusion, in line with Li et al (2014) and Study 2's findings, the results of Study 3 indicate that Chinese urban children's ability to identify search engine advertisements was developed with age, and Chinese urban children could recognize most search engine advertisements by the age about 12. Results of Study 3 also showed that the effects of different search engine advertising presentation mode, the picture-based and text-based, and the living area, urban or rural, only had limited impact on children's recognition of search engine advertising. As different country has their unique advertising culture, to investigate whether the development of children's ability to identify search engine advertising was national-specific or universal, Study 4 was conducted in the UK and used the same procedure and translated the same web pages that used in Study 2 and 3. Study 4 would make a precise comparison between UK and

Chinese children's accuracy to recognize search engine advertising by comparing with the Chinese urban children in Study 3.

CHAPTER 5

5. STUDY 4: A COMPARISON BETWEEN CHINESE URBAN AND UK CHILDREN'S ABILITY TO IDENTIFY PICTURE-BASED AND TEXT-BASED SEARCH ENGINE ADVERTISEMENTS

5.1 Introduction

Most studies of children's awareness of advertising, including identifying advertising and understanding advertising's intents, have been conducted only within a single country (Lapierre, 2015; Rozendaal, Buijzen, & Valkenburg, 2010), but as stated in Section 1.1.3, Chapter 1, countries with different cultures can have an effect on children's consumer socialization (Lapierre & Rozendaal, 2018; Rose, Dalakas, & Kropp, 2002). For example, Lapierre and Rozendaal (2018) conducted a survey among mothers of children aged 5 to 12 years old from the US and Netherlands. Results showed that children in the US owned more media devices, spent more time with media, were more influenced by other people, made more purchase requests and argued more with parents about their purchases than did children in the Netherlands. Lapierre and Rozendaal pointed out that different countries have different advertising cultures, which could affect the ways children respond to advertising and how children behave as consumers. Hence, there are several possible differences between countries, such as advertising culture, which includes advertising-related policy differences (Caraher, Landon, & Dalmeny, 2006), and language (Li, 2017; Luk & Bialystok, 2005; Wu et al., 2002), which might affect children's awareness of advertising.

5.1.1 Cross-national comparisons between China and the UK

The advertising culture is different between China and UK. Study 1 compared Chinese and UK children's media use patterns and their understanding of the paid-for search engine advertising based on questions taken from Ofcom (2018a). The results of Study 1 showed that UK children spent more time using the Internet, and more UK children had an insight of the paid-for nature of the search engine advertising than did Chinese children. As mentioned in Section 1.8.3, Chapter 1, China has relatively few and less clear advertising-related regulations than the UK. For example, there has been no clear definition for what age should be considered as children and no clear restriction for different broadcasting platforms.

Among the many differences in culture between China and the UK, there are differences in language (Li, 2017; Luk & Bialystok, 2005; Wu et al., 2002), and the orthography children were learning (Castles, Rastle, & Nation, 2018; Lin et al., 2010). Chinese and English are categorized into different writing systems (Chang, Chen, & Perfetti, 2018). Chinese belongs to the morphophonetic group as Chinese words representing elements of both meaning and sound, while English belongs to the alphabetic group as English words representing individual sounds or phonemes (Chang, Chen, & Perfetti, 2018). For example, in Chinese the word 人, means human, is a pictograph that looks like a person stands on two legs. In contrast, the English word human has no resemblance to a real person. To learn the alphabetic language, such as the English, children should build the symbol-to-sound relationship, which is the basis for children to translate printed words into spoken language, and further access the meaning of words (Bysbaert, Stevens, Mandra, & Keuleers, 2016).

Learning Chinese words is much more difficult than learning an alphabetic language as it builds on many more phonetic and semantic components (Katz & Frost, 1992). To facilitate the reading of Chinese words at the initial stage, Pinyin, an alphabetic system alongside the learning of Chinese words, was introduced in 1958 (Lin et al., 2010).

Pictures could also facilitate the learning of Chinese for beginners (Luk & Bialystok, 2005; Wu et al., 2002). For example, Wu et al (2002) taught children to associate Chinese words to their referent pictures, and found similar features in words and pictures facilitated the word learning. Based on Wu et al's (2002) finding, Luk and Bialystok (2005) asked university students from the UK, without any prior knowledge about Chinese words, to guess the meaning of two groups of Chinese words (iconic words or arbitrary words) by choosing from two pictures. A higher accuracy was found for the iconic group, while the accuracy of the arbitrary group was at the chance level. Pictures were helpful for naïve Chinese readers, such as elementary school children, and also for people who were starting to learn Chinese. Researchers have also shown distinct mechanisms for processing Chinese words, for English words and pictures (Krafnick et al., 2016; Yum, Holcomb, & Grainger, 2011). Such language differences might be reflected in differences in how well Chinese and UK children process the words and text on a web page. However, some researchers have argued that not all Chinese words are pictographic, and that there are similarities between Chinese and English as they are both linguistic materials (Li, 2017; Lo & Yeh, 2018; Shu et al., 2003). An analysis of over 2,500 Chinese words taught in elementary schools found that less than one tenth of the words were pictographic (Shu et al., 2003).

As Chinese and English words are linguistic materials, they activate the same brain areas for word-specific processing (Bolger, Perfetti, & Schneider, 2005; Lo & Yeh, 2018). Such similarities suggest that there will not be a large enough difference between English and Chinese language processing to affect an understanding of web pages or web page advertising. For example, Li et al (2014) found little difference between UK and Chinese children's recognition of web advertisements on typical web pages. In another cross-national study, Ali et al (2009) compared children's recognition of web based advertisements in the UK and in Indonesia, and there was no difference between Indonesia and UK children's recognition of web advertising.

However, previous researchers have not investigated cross-national differences in children's awareness of specific search engine page advertisements. Hence, Study 4 not only investigated UK children's ability to recognize search engine advertisements, but also compared UK and Chinese urban children's performance in terms of Study 3's results. Given the lack of cultural differences in Li et al (2014) and Ali et al (2009) with typical web pages we did not expect major differences between UK and Chinese children in Study 4.

5.2 Method

5.2.1 Participants

Data for the UK sample in Study 4 were collected from July to October 2017. There were 128 children recruited from a school in Sheffield, United Kingdom. The children were divided into four age groups: 6-year-olds (M = 6.21, SD = 0.42); 8-year-olds (M = 8.31, SD = 0.47); 10-year-olds (M = 10.13, SD = 0.34), and 12-year-olds (M = 12.31, SD = 0.47). In each age group, there were 32 children, half were girls and half were boys. Study 4 received ethics approval from the Department of Psychology Ethics Sub-Committee at the University of Sheffield. Permissions were also obtained from the school headteacher, the class teachers and the children's parents before conducting the study. The children were asked if they were willing to take part on the day of the study.

Children were tested individually in a quiet room to avoid distraction. To avoid interrupting the child's normal study times each child was tested after the end of their regular classes.

5.2.2 Materials

The testing materials were 34 invented search engine web output pages, which were translated into English from the Chinese output pages used in Studies 2 and 3 (see Figure 5.1 for an example). These search engine web pages had been specially designed for the previous studies, so that neither the content nor the advertisements would be familiar to children. Each search engine web page had a searched key word (for example, 'Earth') and each page contained four main parts.

Two of the four parts had text-related information and the other two parts had picture-related information. These parts were randomly laid out in the four main quarters of each web page, not including the search bar. Each web page contained only one advertisement, half of the advertisements were picturing-based (see examples in Figures 5.2 and 5.3), and the other half were text-based (see examples in Figures 5.4 and 5.5).

Four of UK's top search engines were selected, including Google, Bing, Yahoo and Ask (Inetstart, 2017). Hence, the design of the invented UK search engine web pages in Study 4 was matched to one of these four search engine websites (see Figure 5.6).

Before conducting the experiment, all 34 invented pages were presented to a group of 10 adults in the UK and the adults were asked to point out what they thought was an advertisement on each page. All the adults consistently and correctly identified all the advertisements quickly. Hence, the invented search engine web pages looked similar to typical search engine advertisements from adult Internet users' perspective. During the study the search engine web pages were randomly presented on a laptop screen.

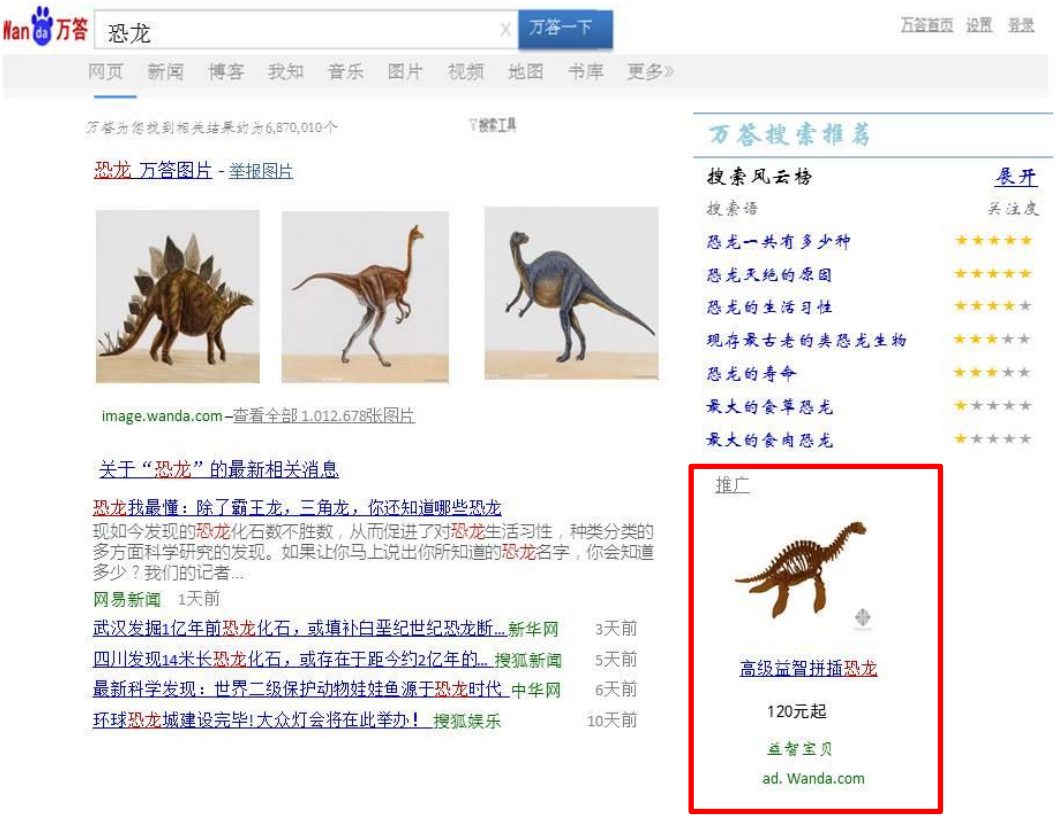

Figure 5.1: Chinese web page as used in Studies 2 and 3 showing a picture-based advertisement is highlighted in a red square (the square was not shown on the actual materials).

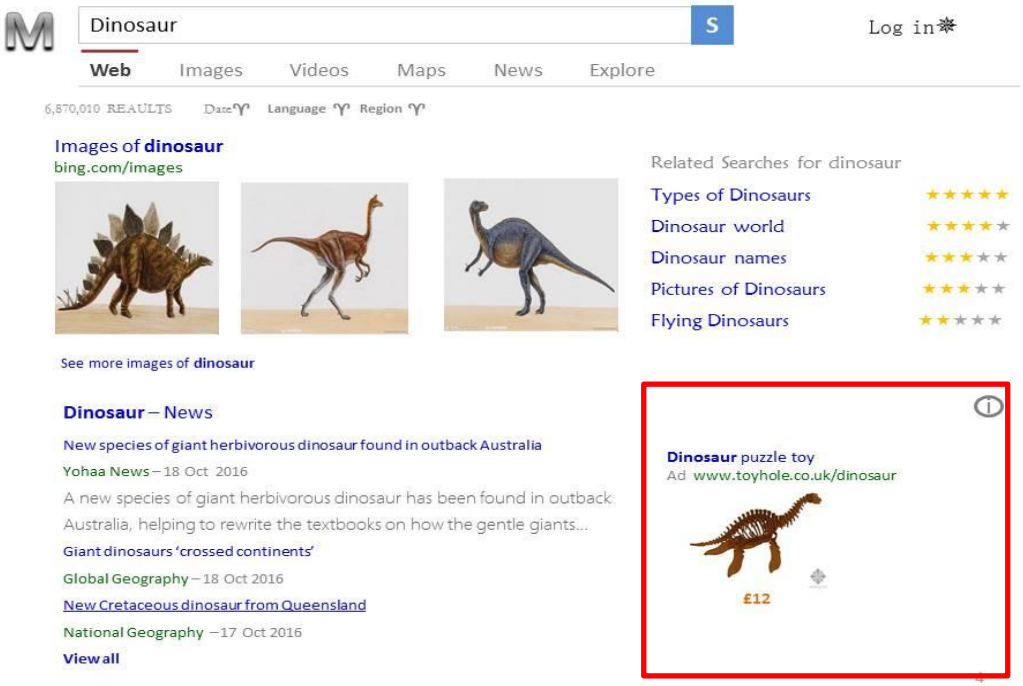

Figure 5.2: Translation of Figure 5.1 into English for Study 4 (the square was not shown on the actual materials).

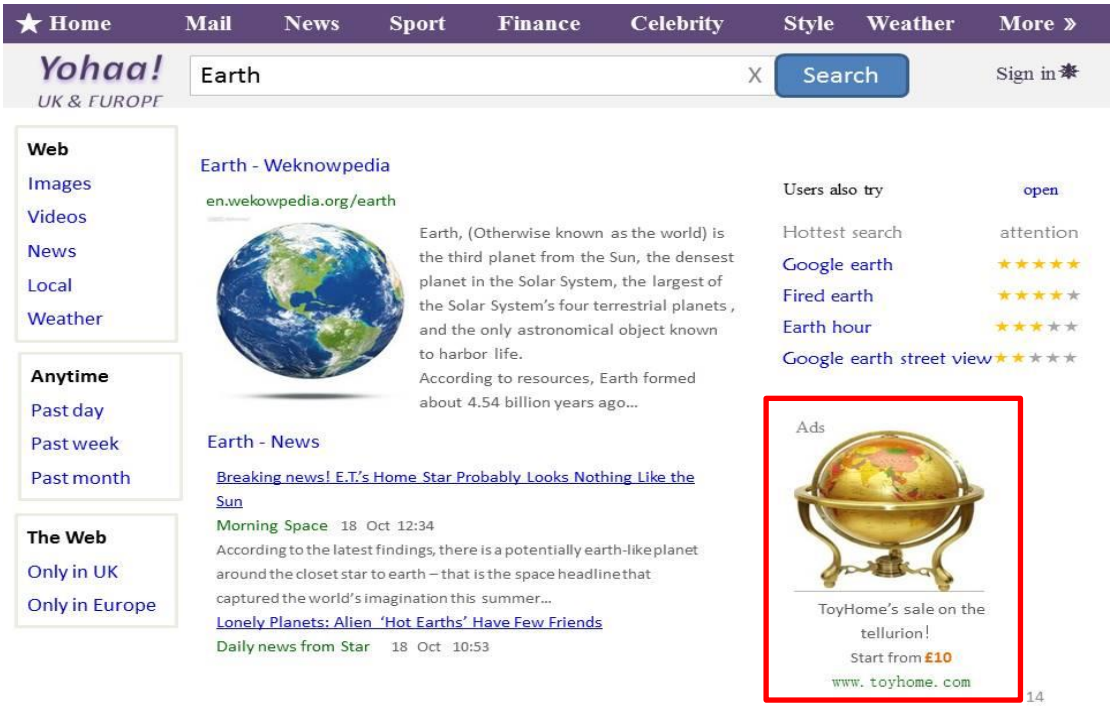

Figure 5.3: An example of English search engine web page with a picture-based advertisement is highlighted in a red square (the square was not shown on the actual materials).

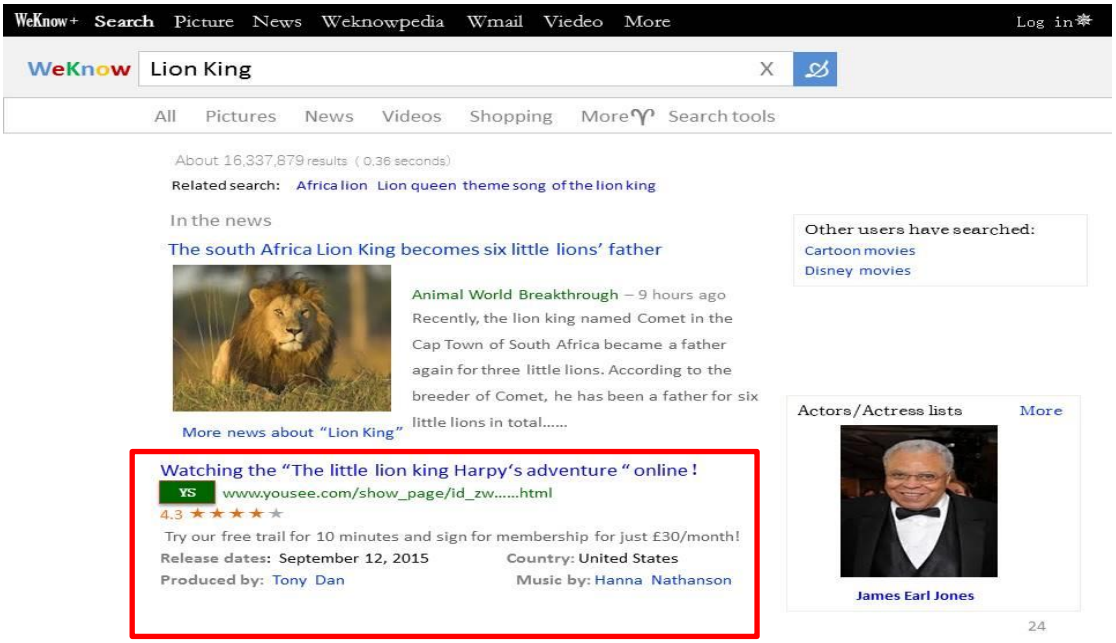

Figure 5.4: An example of English search engine web page with a text-based advertisement is highlighted in a red square (the square was not shown on the actual materials).

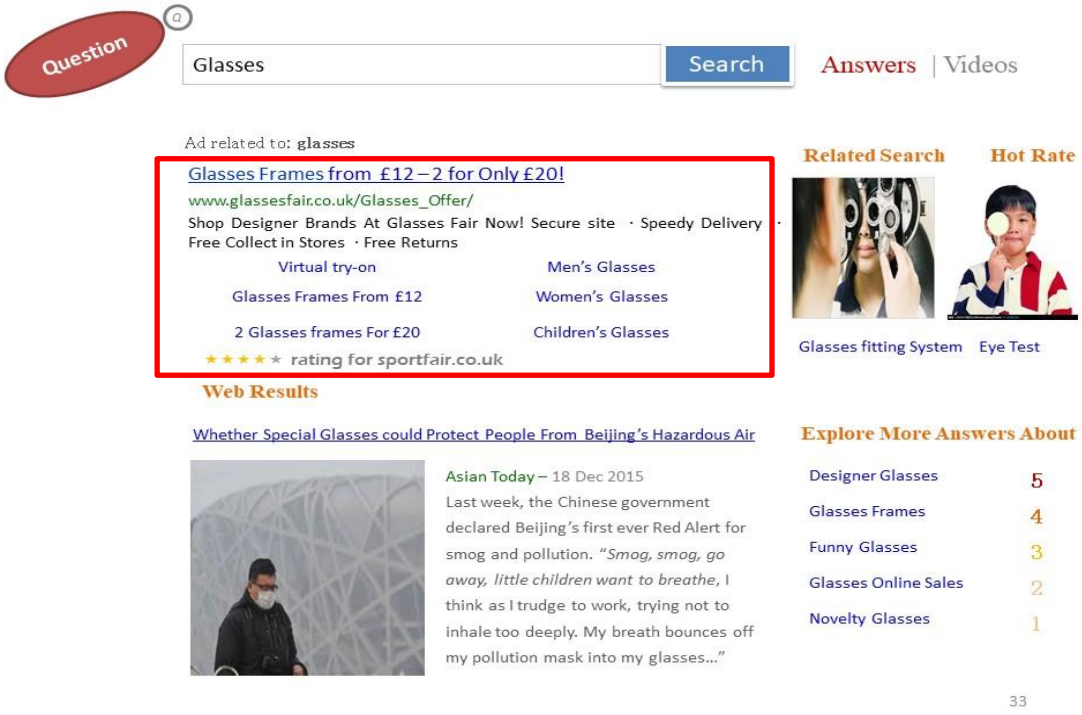

Figure 5.5: Another example of English search engine web page with a text-based advertisement is highlighted in a red square (the square was not shown on the actual materials).

Figure 5.6: Original website labels used in Studies 2 and 3 and the modified labels used in Study 4.

For a practice, each child was shown one example of a search engine web page. On this page the four main parts of the page were labelled with numbers (see Figure 5.6).

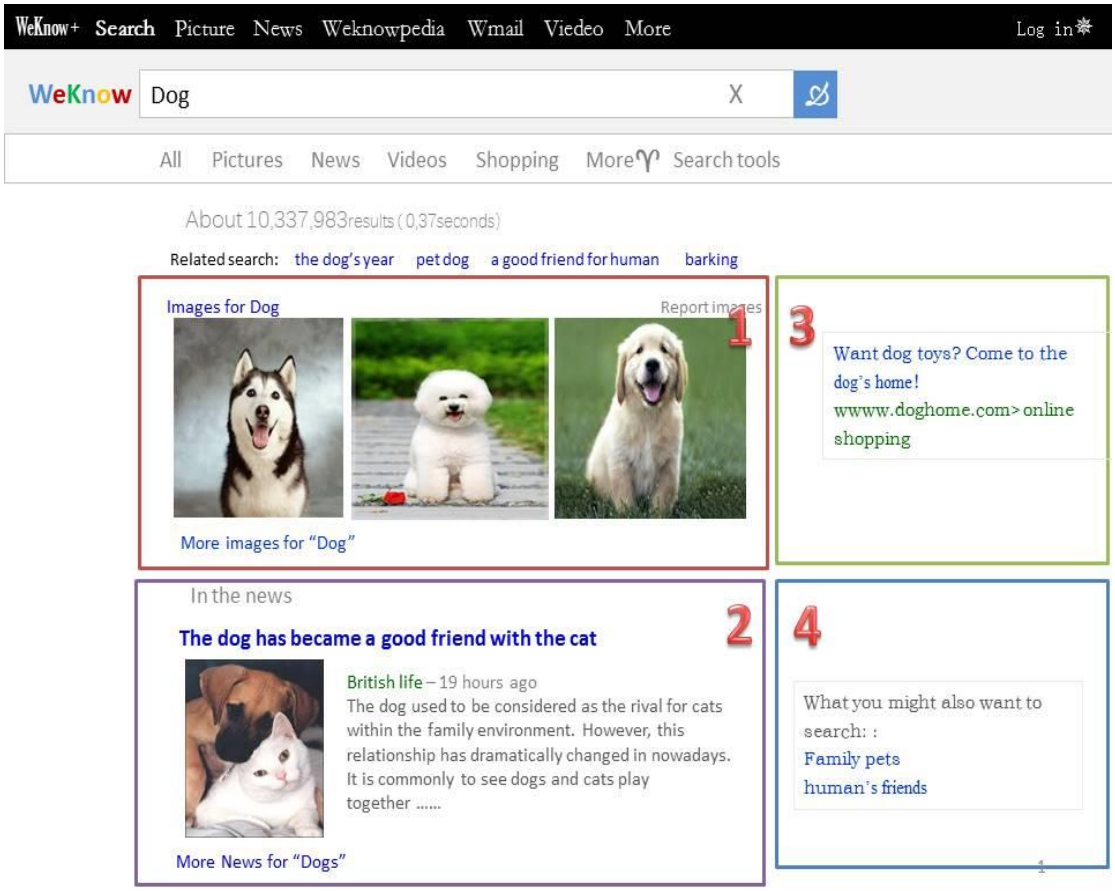

Figure 5.6: The translated sample search engine page with numbers to label the positions on the web page.

5.2.3 Procedure

The procedure was the same as in Studies 2 and 3 (see pages 121-123), children still had the experimenter read the materials for them if they could not read. Similar to Studies 2 and 3, all of the 6-year-olds required help in reading the materials, the 8-year-olds asked help in reading sometimes, and the older children, aged 10- and 12-year-olds barely asked help in reading the materials.

5.3 Results

5.3.1 Children's performance in search engine advertising recognition task

Table 5.1a and 5.2a show the mean number and percentage of advertisements recognized by each age group of the UK urban sample in Study 4. As children could point out one of the four main parts in the web page if they thought there was an advertisement, the rate that children guessed correctly was one in four (25%).

As shown in Tables 5.1a and 5.2a, the 6-year-old UK children could recognize about a quarter of the search engine advertisements, the 8-year-olds could recognize about one-third, the 10-year-olds could recognize about three-quarters and the 12-year-olds could recognize most of the search engine advertisements.

Table 5.1b and 5.2b are as the same as the Table 4.4a and 4.5a from Study 3, which shows the mean number and percentage of advertisements recognized by each age group of the Chinese urban sample. The statistical comparison results were discussed in Section 5.3.2.

Table 5.1a: The mean of UK children correctly recognized advertisements for each group and for each type of advertisement in Study 4.

	Picture-based ads (max score 17)	**Text-based ads (max score 17)**	**All advertisements (max score 34)**
6-yr-olds	5.69	2.76	8.45
8-yr-olds	8.69	4.84	13.53
10-yr-olds	15.06	11.81	26.87
12-yr-olds	16.06	15.88	31.94

Table 5.1b: The mean number of correctly recognized search engine advertisements for each group from the Chinese urban sample and for each type of advertisement.

	Picture-based ads (max score 17)	Text-based ads (max score 17)	All advertisements (max score 34)
6-yr-olds	5.53	4.03	9.56
8-yr-olds	9.25	5.88	15.13
10-yr-olds	12.66	12.97	25.63
12-yr-olds	15.34	15.56	30.91

Table 5.2a: The percentage of UK children correctly recognized advertisements for each group and for each type of advertisement in Study 4.

	Picture-based ads (max score 17)	Text-based ads (max score 17)	All advertisements (max score 34)
6-yr-olds	33.5%	16.2%	24.9%
8-yr-olds	51.1%	28.5%	39.8%
10-yr-olds	88.6%	69.5%	79.0%
12-yr-olds	94.5%	93.4%	93.9%

Table 5.2b: The percentage of correctly recognized search engine advertisements for each group of the Chinese urban sample and for each type of advertisement.

	Picture-based ads (max score 17)	Text-based ads (max score 17)	All advertisements (max score 34)
6-yr-olds	32.5%	23.7%	28.1%
8-yr-olds	54.4%	34.6%	44.5%
10-yr-olds	74.5%	76.3%	75.4%
12-yr-olds	90.3%	91.5%	90.9%

A normality test, the Kolmogorov-Smirnov test, showed that none of the dependent variables were normally distributed for the number of correctly recognized search engine advertisements, $D(128) = 0.15$, $p < .001$, for the number of correctly recognized picture-based search engine advertisements, $D(128) = 0.21$, $p < .001$, or for the number of correctly recognized text-based search engine advertisements, $D(128) = 0.16$, $p < .001$. Hence, non-parametric tests were used for the analysis.

A Kruskal-Wallis Test was used to compare performance between the age groups (see Table 5.1 and 5.2). Results showed significant differences across four age groups for the number of correctly recognized search engine advertisements, χ^2 (3) = 109.78, p < .001, for the number of correctly recognized picture-based search engine advertisements, χ^2 (3) = 102.56, p < .001, and for the number of correctly recognized text-based search engine advertisements, χ^2 (3) = 101.96, p < .001.

Mann-Whitney tests were used to follow up these findings. A Bonferroni correction was applied to control for Type 1 errors, all effects are reported at a 0.05/4 = 0.0125 level of significance. For the performance in recognizing all search engine advertisements, the 6-year-olds performed significantly poorer than the 8-year-olds, U=23.0, r=-.83, p<.0125, the 10-year-olds, U<.001, r=-.87, p<.0125, and the 12-year-olds, U=32.0, r=-.81, p<.0125. The performance of the 8-year-olds was poorer than the 10-year-olds, U<.001, r=-.86, p<.0125, and the 12-year-olds, U=32.0, r=-.81, p<.0125. The performance of the 10-year-olds was poorer than the 12-year-olds, U=32.0, r=-.81, p<.0125.

For recognizing picture-based (see Table 5.1) search engine advertisements, the 6-year-olds were significantly poorer than the 8-year-olds, U=91.5, r=-.72, p<.0125, the 10-year-olds, U<.001, r=-.87, p<.0125, and the 12-year-olds, U=32.0, r=-.82, p<.0125. The 8-year-olds were poorer than UK 10-year-olds, U=4.5, r=-.86, p<.0125, and the 12-year-olds, U= 32.0, r=-.82, p<.0125. The 10-year-olds were also poorer than the 12-year-olds, U=183.5, r=-.58, p<.0125.

For recognizing text-based search engine advertisements (see Table 5.1), the 6-year-olds were significantly poorer than the 8-year-olds, U=261.0, r=-.43, p<.0125, the 10-year-olds, U=1.0, r=-.86, p<.0125, and the 12-year-olds, U=25.5, r=-.83, p<.0125. The 8-year-olds were poorer than the 10-year-olds, U=17.0, r=-.84, p<.0125, and the 12-

year-olds, U= 29.0, r=-.82, p<.0125. The 10-year-olds were also poorer than the 12-year-olds, U=34.0, r=-.81, p<.0125.

To investigate whether there was a difference in the number of correctly recognized picture-based and text-based search engine advertisements, a Wilcoxon test was applied. Overall, there was a significant difference between the number of correctly recognized advertisements for each type of search engine advertisement, z=-7.77, p<.001, r=-.49. Comparing the performance for the number of correctly recognized advertisements for each age group showed a better performance in recognizing picture-based advertisements than text-based advertisements in the 6-year-olds, z=-4.19, p<.001, r=-.52, the 8-year-olds, z=-4.27, p<.001, r=-.53, and the 10-year-olds, z=-4.68, p<.001, r=-.58. There was no difference for the 12-year-olds, z=-0.89, p>.05, r=-.11. In other words, most of the children, except the 12-year-olds, performed better at recognizing picture-based advertisements than text-based advertisements.

5.3.2 Comparison between Chinese urban children's performance (from Study 3) and UK children's performance in the search engine advertising recognition task

The data from Study 4 was compared to the data from Study 3 with the urban Chinese children (see Table 4.4 for the mean scores from Chapter 4). A Kolmogorov-Smirnov test, showed that none of the dependent variables were normally distributed for either the Chinese urban or the UK children, for the number of correctly recognized search engine advertisements, D(256) = 0.16, p < .001, for the number of correctly recognized picture-based search engine advertisements, D(256) = 0.15, p < .001, or for the number of correctly recognized text-based search engine advertisements, (256) = 0.16, p < .001. Therefore, the non-parametric tests were used for the analysis.

A Mann-Whitney test was used to compare the performance of Chinese and UK children in the search engine advertising recognition task. A Bonferroni correction was applied to control for Type 1 errors, all effects are reported at a 0.05/2 = 0.025 level of significance. Children from both regions were compared in terms of age. For recognizing search engine advertisements, the 8-year-old UK children were significantly poorer than 8-year-old Chinese children, $U=64.0$, $r=-.76$, $p<.001$. There was no difference in the 6-year-olds, $U=404.5.0$, $r=-.18$, $p>.025$, the 10-year-olds, $U=358.0$, $r=-.26$, $p>.025$, or the 12-year-olds, $U=349.0$, $r=-.28$, $p>.025$.

For recognizing picture-based search engine advertisements, the UK children were significantly poorer than the Chinese urban children in all age groups: 6-year-olds, $U=313.0$, $r=-.34$, $p<.025$; 8-year-olds, $U=63.0$, $r=-.76$, $p<.025$; 10-year-olds, $U=300.5$, $r=-.36$, $p<.025$, and 12-year-olds, $U=336.5$, $r=-.32$, $p<.025$.

For recognizing text-based search engine advertisements, there were no differences between UK and Chinese urban children in any of the age groups; 6-year-olds, $U=434.0$, $r=-.13$, $p>.025$; 8-year-olds, $U=420.0$, $r=-.16$, $p>.025$; 10-year-olds, $U=399.5$, $r=-.19$, $p>.025$, and 12-year-olds, $U=409.5$, $r=-.18$, $p>.025$.

5.4 Discussion

Study 4 investigated the ability to recognize search engine advertising among a group of UK children. The 6-year-olds could recognize about one-quarter, the 8-year-olds recognized about one-third, the 10-year-olds recognized about three-quarters and the 12-year-olds recognized most of the search engine advertisements. Results showed an improvement in children's ability to recognize advertisements on search engine result pages with increasing age, and children had developed most essential skills to recognize

search engine advertising by the age of about 12 years. These findings were similar to the age-related findings in Studies 2 and 3 with Chinese children.

By comparing Chinese urban and UK children's accuracy in the search engine advertising recognition task Study 4 showed no significant difference in the 6-year-olds, the 10-year-olds and the 12-year-olds, although the 8-year-old Chinese children performed better than 8-year-old UK children. Hence, there was a country-to-country difference for the 8-year-olds, but this difference had disappeared by the age of 10 as there were no differences between the Chinese urban and UK groups for the two oldest age groups. As both the UK and Chinese 6-year-old children performed at the level of chance, the lack of differences between the youngest Chinese and UK groups is likely to be because both groups were mainly guessing the responses that they made.

Study 4 also compared Chinese urban children and UK children's performance in recognizing picture-based and text-based search engine advertising. The results showed that Chinese children were more accurate in recognizing picture-based search engine advertising, but there was no difference between Chinese and UK children in recognizing text-based search engine advertising. As mentioned in section 5.1.1, UK children learning English only need to associate the written symbols to spoken language through the alphabetic system of English (Brysbaert et al., 2016). While Chinese children can learn Chinese through not only an alphabetic system, Pinyin, but also through pictographic cues at the initial language learning stage in primary schools (Chang, Chen, & Perfetti, 2018; Lin et al., 2010; Luck & Bialystok, 2005). Therefore, the significant difference of performance in recognizing picture-based search engine advertising between Chinese and UK children might because Chinese children accumulate more experience in extracting information from a picture than do UK children (Brysbaert et al., 2016; Chang, Chen, & Perfetti, 2018; Lin et al., 2010; Luck & Bialystok, 2005).

In conclusion, results from Study 4 showed that UK children's abilities to recognize search engine advertisements developed with age, and UK children could recognize most of search engine advertisements by the age of about 12. These findings are in line with Li et al's (2014) study. By comparing the accuracy of recognizing search engine advertising between UK and Chinese urban children, the results of Study 4 showed a difference in one age group, the 8-year-olds, and this could be accounted for by national differences such as different media experience at that age. Chinese children were better at recognizing picture based advertisements and this could be due to Chinese children's greater experience of learning pictographic representations of Chinese words, which might facilitate Chinese children's ability to extract and process picture-based information on a search engine page.

CHAPTER 6

6. DISCUSSION

Advertising to children has been investigated by many researchers (Ali et al., 2009; Chan & McNeal, 2004a; De Jans et al., 2019; Li et al., 2014). As an increasingly valuable market, children can influence household purchasing, make their own purchases, and may become lifetime consumers of specific brands or products (Baldassarre, Campo, & Falcone, 2016; Connor, 2006). However, advertising has been associated with child obesity, stimulating materialistic values in children, parent-child conflict, and advertising some products may affect children's physical health and well-being (Buijzen & Valkenburg, 2003a; Kelly et al., 2015).

Compared to adults, children are more vulnerable to advertising messages as they have limited cognitive skills, less experience dealing with advertising and have less mature advertising knowledge (Kunkel et al., 2004; Moses & Baldwin, 2005; Rozendaal, Buijzen, & Valkenburg, 2010). Researchers have suggested that children's recognition of advertising is essential for children's understanding of advertising messages (Kunkel et al., 2004; Rozendaal, Buijzen, & Valkenburg, 2010).

Previous research into children's recognition of advertising has focused on children's recognition of television advertising (Butter et al., 1981; Levin, Petro, & Pettrella, 1982; Moses & Baldwin, 2005). Such research shows that children can recognize television advertising by the age of about 5, and children develop an understanding of television advertising by the age of about 8 years (Butter et al., 1981; Levin, Petro, & Pettrella, 1982; Rozendaal, Buijzen, & Valkenburg, 2010). Children above 12 years of age have developed sufficient cognitive skills to critically and skeptically cope with traditional advertising messages (John, 1999; Roedder, 1981). Some regulations have taken the

age of 12 years as a threshold after which it is acceptable to advertise to children as if they are adults (John, 1999; Roedder, 1981). Therefore, regulations about advertising to children usually focus on children under 12 years of age, such as the *Self-Regulatory Program for Children's Advertising* in the US (Children's Advertising Review Unit, 2014).

Web advertising is different from traditional advertising like television advertising. In web advertising the advertising messages are often embedded in the content, which makes those messages harder for children to recognize and distinguish from other online content (Ali et al., 2009; Li et al., 2014). As more children are going online (CNNIC, 2018; Common Sense Media, 2017; Ofcom, 2017, 2018a) there is an escalating exposure of web advertising aimed at children that raises concerns about the fairness and appropriateness of that advertising (De Jans et al., 2019; Hudders et al., 2017). However, as noted in Section 1.5.3, Chapter 1, there are few regulations about web advertising aimed at children.

6.1 Summary of main findings

Study 1 measured Chinese children's media use, and presented a comparison between the media usage patterns in Chinese and UK children. Study 1 found that, like children in many Western countries (Common Sense Media, 2017; Ofcom, 2017, 2018a), Chinese children spent a large amount of time accessing and using media, including televisions, smartphones and computers.

By comparing Study 1's data from China with the data reported by Ofcom in the UK (Ofcom, 2018a) a number of differences were noted. Children in the UK spent more time with media than did Chinese children. One possible reason is that some other activities, such as extra-curricular tutoring, occupy Chinese children's leisure time

rather than the use of digital media. According to a recent national report, Chinese children spend half their leisure time on homework from schools, from parents and in extra-curricular tutoring, a quarter of their time playing outside and a quarter of their time using digital media during a typical weekday (China National Children Center, 2019). One major purpose of taking extra-curricular tutoring is to enhance children's success in the labour market by eventually achieving a good professional degree (China National Children Center, 2019; Lushington et al., 2015). Chinese children's extra-curricular tutoring affects children's sleep time and quality and leaves little space for other activities (China National Children Center, 2019; Li & Wang, 2014; Lushington et al., 2015).

As described in Section 3.1.3, Chapter 3, the advertising format on major search engine websites in China (e.g. Baidu) is similar to those in Western countries (e.g. Google). Study 1 found only one-seventh of the Chinese children could understand the paid-for nature of search engine advertising. This finding was consistent with Ofcom's (2018a) UK report, which also showed that only a minority of UK children had an insight of the nature of the sponsored links listed on Google results pages as advertising.

Previous research has shown that children can recognize some web advertisements by the age about 10 years, and can recognize most web advertising by the age of about 12 years (Ali et al., 2009; Li et al., 2014). However, children can only recognize about two-thirds of search engine advertising by the age of about 12 years (Li et al., 2014). This would suggest that successfully recognizing advertisements on search engine pages is an even later achievement than recognizing advertisements on other web pages.

However, Li et al's (2014) study was conducted with only 60 UK children, and the results from Ofcom (2018a) and Study 1 were each based on a limited number of questions in the context of wider surveys. To make a more extensive investigation of

children's awareness of search engine advertising, and to do so in more than just the UK, Studies 2, 3 and 4 were carried out. These studies included large samples of children in rural and urban China, and also in the UK, and they had consistent findings. Very young children had little ability to recognize search engine advertising and it was not until about 12 years of age that children could consistently identify advertisements on search engine pages. The results were very similar across the three studies in two countries suggested that the findings were generalisable and probably apply to most children. Future research could consider children's ability in other countries and with different types of web pages.

Results from Studies 2 to 4 indicated children can only recognize most search engine advertisements by the age of 12, which is several years later than children can recognize television advertisements by the age of 5 (Butter et al., 1981; Stephens, Stutts, & Burdick, 1982). One possible reason for children's poor performance in recognizing search engine advertisements may be that the embedded format of search engine advertising makes it difficult for children retrieve their previous experience of interpreting television advertising (Ali et al., 2009; Li et al., 2014). According to the information processing theory (Roedder, 1981), the LCMP (Lang, 2000), and the PCMC model (Buijzen et al., 2010), children's underdeveloped cognitive skills will restrict their ability to distinguish advertising in embedded formats (Li et al., 2014).

Studies 2 to 4 also investigated the effect of advertising presentation mode, picture-based or text-based, on children's recognition of search engine advertising. Researchers have argued that using pictures as a presentation mode is more attractive to children and facilitates better learning and comprehension than using a text-based presentation mode (Chau, Au, & Tam, 2000; Goodrick, 2011; Piteters & Wedel, 2004). Hence, the original prediction in Study 2 was that children would be more accurate at recognizing picture-based search engine advertising than text-based advertising. However, there

was no evidence from the results of Studies 2 to 4 to suggest that picture-based advertisements were easier for children to recognize than text-based advertisements.

Study 3 investigated children's ability to identify search engine advertising among a group of Chinese urban children, and compared the performance of those urban children with the rural children in Study 2. As explained in Section 4.1.2, Chapter 4, there may be a digital divide between rural and urban children in China. The digital divide is a result of rural-urban Internet access inequality. This divide has been reported to influence children's media use and reinforce the disparity in rural-urban children's development, such as education and training (Chan & McNeal, 2006a, Li & Ranieri, 2013; Liao et al., 2016; Wang, 2013; Yang et al., 2013). Such a divide was expected to put rural children at a disadvantage in recognizing search engine advertisements. But there was little difference between the performance of children in Study 2 (rural) and Study 3 (urban) and no strong evidence of a rural-urban divide in the awareness of search engine advertising. However, the pre-test question results in Studies 2 and 3 showed that both the urban and rural children had approximately equal access to the Internet and spent approximately the same number of hours on the Internet. This may have reduced any possible urban-rural divide. Future research should consider comparing samples of children who not only live in different areas, but who are also more clearly different in their access to and experience of the Internet.

6.2 Implications

Findings from Studies 1 to 5 have implications for regulations. Contemporary children are exposed to an increasing amount of advertising including embedded advertising formats (Kunkel et al., 2004; Rozendaal, Buijzen, & Valkenburg, 2011). In response to this issue, some governments and organizations in Western countries have focused on television advertising that is aimed at children, and have produced reports

such as *Self-Regulatory Program for Children's Advertising* in the US (Children's Advertising Review Unit, 2014), or *Unfair Commercial Practice Directive* in the EU (European Commission, 2016). Also, a few countries have placed bans on particular types of television advertising, for example, UK has restrictions on product placements in children's television programming since 2010 (Ofcom, 2016; The Food Foundation, 2017).

Despite existing regulations, there is still a lack of regulation to protect children from new interactive and embedded advertising formats. The UK has been the first country to issue relevant guidance, *Recognition of Advertising: Online Marketing to Children under 12*, in 2017, which required advertisers to improve their online disclosure so that children could more easily identify web advertisements (Committee of Advertising Practice, 2017). As findings from Studies 2 to 4 suggested picture-based advertisements were not easier to recognize than text-based advertisements, advertisers should consider other ways, such as adding labels and using pop up windows, to make children aware that they are being targeted by online advertisements. Future research could consider the most effective ways to warn children about advertising.

Some advertisers are aware of children's susceptibility to advertising effects, but they still consider children's awareness of advertising based on older developmental theories and from the empirical evidence based on television advertising recognition research (Daems, Pelsmacker, & Moons, 2019). The findings of this thesis suggests that governments and advertisers should be more aware that children's ability to recognize search engine advertising develops several years later than their ability to recognize television advertising. Educating parents and teachers about the nature of online advertising and about children's lack of awareness about online messages would also be important.

In summary, this thesis has shown children's ability to recognize search engine advertising develops several years later than their ability to recognize television advertising, which has implications to governments, parents and educators. There is a need for further research into children's understanding of non-traditional advertising, and that research could inform future guidelines and regulations.

6.3 Future research

As this thesis only investigated children's ability to identify search engine advertising, there are several directions that future research needs to consider. First, television-based literature indicates that television advertising still has effects on those children who are too young to recognize them (Miller, Taveras, Rifas-Shiman, & Gillman, 2008; Zimmerman & Bell, 2010). In terms of the findings of this thesis, future research can investigate whether unrecognized search engine advertisements have an effect on those younger children, aged 6- and 8- year-olds. Based on previous research into television advertising effects on children, there might be a search engine advertising effect on children even though they could not recognize those advertisements. For example, future researchers can consider Harris, Bargh and Brownell's (2009) research method to investigate television food advertising's priming effects on children's eating behaviour. Researchers could present young children with two groups of search engine web pages, one group of pages would only contain non-food advertising, but the other group would contain crisp advertising. Children could then be given crisps to eat and the amount eaten could be measured. If children are influenced by the crisp advertising on the web pages it would be predicted that the children in the second group would eat more crisps.

Second, this thesis only focuses on children's recognition of search engine advertising, but did not explore what cues children use to identify search engine

advertising. Future research can recruit both children and adults and ask how they identify the search engine advertising, and whether there is a difference between children and adults' ways to identify the advertising. For instance, according to Li et al (2014), children and adults differed in their ways to select the advertising picture on invented web pages. Their reasons included that if the picture was flashing that it was like other advertisements they had seen aiming to sell things.

Third, besides the urban-rural digital divide in China and differences in education and language system between Chin and UK, there might be other factors also affect children's recognition of search engine advertising. For example, children's advertising literacy training might affect children's awareness of television advertising (Eagle, 2007; Gunter, Oates, & Blades, 2005). Future research could investigate whether advertising literacy training could affect children's recognition and understanding of search engine advertising, and other types of online advertisements they are exposed to.

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APPENDIX A. WEB PAGES FOR STUDY 2 AND STUDY 3

万答 猴子 万答一下

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金猴拜寿	★★★★★
最新猴子动画片	★★★★★
猴子的种类	★★★★★
猴子的寿命	★★★★★

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中国网络电视台 - 2015年12月01日 21:40

民间大家：彩灯传承人的“猴子”灯

中关村在线 -2015年11月31日 20: 35

3

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现如今发现的恐龙化石数不胜数，从而促进了对恐龙生活习性，种类分类的多方面科学研究的发现。如果让你马上说出你所知道的恐龙名字，你会知道多少？我们的记者...

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四川发现14米长恐龙化石，或存在于距今约2亿年的... 搜狐新闻 5天前

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万答搜索推荐

搜索风云榜 展开

搜索语	关注度
恐龙一共有多少种	★★★★★
恐龙灭绝的原因	★★★★★
恐龙的生活习性	★★★★★
现存最古老的类恐龙生物	★★★★★
恐龙的寿命	★★★★★
最大的食草恐龙	★★★★★
最大的食肉恐龙	★★★★★

推广

高级益智拼插恐龙

120元起

益智宝贝

ad. Wanda.com

4

Wan 万答 熊猫 万答一下

万答首页 设置 登录

网页 新闻 博客 我知 音乐 图片 视频 地图 书库 更多»

万答为您找到相关结果约为8,374,082个

下载工具

熊猫 万答科普

熊猫，通常代指大熊猫（学名：Ailuropoda melanoleuca，英文名称：Giant panda），类属于食肉目的一中哺乳动物，正常体色为黑白两色，身体圆胖，嘴巴、鼻子、眼圈、耳朵，尾巴以及四肢为黑色，其他部分为白色。正常以内八字方式行走，爪子锋利，爱吃竹子，通常生活在四季常青的竹林里。

大熊猫被誉为中国的国宝，享誉活化石的美名，据悉已在地球上生存了至少800万年。大熊猫属于中国国家...

其他含义：中国国宝 世界活化石 寿命象征

www.kepu.wanda.com/

熊猫 万答图片 - 举报图片

image.wanda.com–查看全部1,231,667张图片

万答搜索推荐

熊猫朵儿是一系列以国宝大熊猫为主题的动作喜剧动画电影，讲述了一只笨拙的熊猫成为学霸的故事。

搜索风云榜

搜索语	关注度
熊猫的寿命	★★★★★
熊猫的生活习性	★★★★★
熊猫最爱吃的食物	★★★★★
哪里能看到熊猫	★★★★★
熊猫烧香 病毒	★★★★★

5

Wan 万答 草莓 万答一下

万答首页 设置 登录

网页 新闻 博客 我知 音乐 图片 视频 地图 书库 更多»

万答为您找到相关结果约为5,670,000个

下载工具

草莓 万答科普

草莓（英文: Strawberry），又名红莓，洋莓等。多年生草本蔷薇科目，通常外观呈心形，成熟果实为红色，鲜嫩多汁含有多种维生素，含有甜美的水果芬芳。原产于南美洲后在世界各地广泛栽培...

形态特征 地域分布 培育技术 常见品种 更多>>

查看其它相关“草莓”的7个定义>>

kepu.wanda.com/

ST 草莓日韩购物 甜甜美妆！ 推广链接

台湾草莓日韩美妆！正品火爆热销！日日有新款！加入会员更优惠！GS全球直购支持各种通用付款方式（Visa，MasterCard，银联…），多购多省！

韩国唇膏 查看详情

日本唇膜 查看详情

日本口红 产看详情

cn.globalshopping.strawberrynet.co.tw 2015-12

万答搜索推荐

水果风云榜

排名		热搜指数
1.	苹果	18763↓
2.	橙子	16432↑
3.	草莓	12945↑
4.	西瓜	9842↓
5.	樱桃	8763↓
6.	柚子	7786↑
7.	柠檬	7699↑

搜索风云榜

搜索语	关注度
草莓正常收获季节	★★★★★
草莓种植要求	★★★★★
草莓甜点的做法	★★★★★
草莓的食用价值	★★★★★
孕妇能不能常吃草莓	★★★★★

6

万答 迈迪 万答一下 万答首页 设置 登录

网页 新闻 博客 我知 音乐 图片 视频 地图 书库 更多»

万答为您找到相关结果约为4,700,011个 下载工具

正品迈迪！ 全球直购网站（GS） 推广链接
台湾GS 迈迪正品火爆热销！ 日日有新款！ 加入会员更优惠！ GS全球直购支持各种通用付款方式，购多省！
globalshopping.GS.co.tw 2015-12

ATT 潮流新款迈迪，就在爱淘淘！
明星代言！ 潮流时尚风向标， 迈迪新款！ 爆款！ 纪念款！ 买迈迪运动鞋，就来爱淘淘！
www. aitaotao.com 2015-12

迈迪 万答科普

MaiDi

迈迪 （MaiDi），世界著名运动品牌，德国出产，以其高质量的运动鞋而闻名。其产品被广泛认可，产业面涉及运动鞋，衣服，帽子，包，手表以及相应配件...

发展历史 下属品牌 品牌介绍 官方资讯

www.kepu.wanda.com/

万答搜索推荐

相关搜索 展开



晨跑 跳绳 夜跑

搜索风云榜

搜索语	关注度
迈迪新品	★★★★★
迈迪中国市场	★★★★★
迈迪折扣	★★★★★
迈迪历史	★★★★★
迈迪公司上市	★★★★★
迈迪官方资讯电话	★★★★★
迈迪客服	★★★★★

万答 鞋 万答一下 万答首页 设置 登录

网页 新闻 博客 我知 音乐 图片 视频 地图 书库 更多»

万答为您找到相关结果约为5,3204,014个 下载工具

鞋坏了怎么修 万答我知

通常鞋的损坏分为以下几种： 鞋跟磨损过于严重，导致鞋跟不平，鞋跟损坏或脱落；鞋材质过硬，皮质被磨损严重，导致刮噌，脱色；或由于质量不过关导致的脱漆现象...专家建议，购买鞋时应注意品质和检查商标及防伪标识避免买的品质不过关的产品.....

wozhi.wanda.com/shoe... 万答快照--47% 赞

关于“鞋”的最新相关消息

残疾大象的新“鞋”！重新站起来的感动

新华网 2015年12月12日 9：00
组图： 泰国原因误踩地雷受伤残疾的大象近日重新站了起来。一只形状如同“鞋”的假肢让伤了一只脚的大象“艾迪”重新获得了行走的机会。 目前“艾迪”已经能在动物管理员的协助下站立行走，而且没有任何不适.....
9条类似报道 --万达快照

万答搜索推荐

推广链接

鞋定制！打造独属于你的魅力！
定制男鞋女鞋箱包，多种选择，独家设计，让你拥有别人没有的美丽…
www.designforyou.cn

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男女潮鞋专卖店， 国内外知名品牌，秉承品牌推广服务大众的精神，极力打造…
www.shoesshop.com

鞋样哪家好，精品选天艺
把握潮流先锋，专属设计新潮男女鞋，量身设计，品质保证。
www.tianyishoes.com

其他人还搜

搜索语	关注度
鞋怎么穿好看	★★★★★
鞋跟型要求	★★★★★
鞋的英文怎么说	★★★★★
选购鞋的标准	★★★★★
鞋怎么陈列好看	★★★★★

8

万答 蛋糕 万答一下

万答首页 设置 登录

网页 新闻 博客 我知 音乐 图片 视频 地图 书库 更多»

万答为您找到相关结果约为6,203,090个 下载工具

蛋糕 万答科普

蛋糕是一种被大众广泛喜爱的西点之一，通常可由烤箱制作，近年来随着家庭小作坊的推广，人们逐渐开始用电饭煲，微波炉等常见家庭电器制作蛋糕.....
家庭制作蛋糕通常选用鸡蛋，半塘，牛奶，果汁，葡萄干，奶粉，色拉油，起酥油，水，以及小苏打等原料进行制作。经过搅拌，发酵，烘烤等工序制作而成。

www.kepu.wanda.com/

本地特色蛋糕，当天制作当天送货上门，保证新鲜感! 推广链接
本地特色蛋糕，选取本地特有新鲜食材，调制特色口味，当天制作当天送达，保证美味！本地蛋糕电话：40023332333
www.localcake.cn 2015-12

广州蛋糕连锁店，诚邀您的加盟!
用心做蛋糕，拥有一流培训师，师从欧洲最新以及传统蛋糕制作工艺，吃过都说好。提供专业培训，售后服务，现诚邀您的加盟！加盟热线：020-87790021
www.joincake.com 2015-12

选购网上蛋糕，就到品牌美滋滋蛋糕网!
知名蛋糕品牌信赖加盟！本站独家销售精品蛋糕，1000多个城市当天送达，力争成为中国最具影响力的网上蛋糕店，打造独有品牌，偕同最佳服务，带你领略数千款精致蛋糕...
www.mzzcake.com 2015-12

万答搜索推荐

相关搜索 展开



鸡蛋 面粉 牛奶

告诉你新鲜事儿

热点关注	关注度
鸡蛋有什么食疗作用	★★★★★
如何挑选鸡蛋	★★★★★
双黄蛋的食疗效果	★★★★★
不同鸡蛋的比较	★★★★★
草鸡蛋的好处	★★★★★

9

万答 枕头 万答一下

万答首页 设置 登录

网页 新闻 博客 我知 音乐 图片 视频 地图 书库 更多»

万答为您找到相关结果约为9,298,323个 下载工具

关于“枕头”的最新相关消息

注意！注意！枕头高度不当可能导致颈椎病...
天天新闻-12小时前
生活中的警钟!枕头对起来重睡！专家称，枕头过高会导致骨质增生或椎间盘突出，易引发颈椎病等系列疾病；过低会导致鼻腔咽喉水肿，继而引发打鼾甚至猝死等。正确...
news.tiantian.cn/tv/2015-12-21/doc...

讨好青年粉丝 小铺子街头掀起“枕头保卫战”
楚汉网-18小时前
www.newsch.com/2015/1221/2732...

解密酒店为什么要备有四个枕头？
小道爱搜-21小时前
www.xdas.news.com/20141221/n23422...

枕头 万答科普

枕头，是一种有着悠久历史的睡眠工具。通常来讲，枕头是人们为了拥有一个舒适的睡眠而采用的方形填充物。从现代医学角度而言，人体的脊柱在侧面有三个生理弯曲的曲线，柔软适当的凸型填充物会有效地保证生理曲线的弯曲从而是人体放松。为保护颈部曲线...

传统定义 历史起源 制作要素 特色枕头 更多>>

查看其它“枕头”的含义>>

www.kepu.wanda.com/

万答搜索推荐

相关搜索 展开



成人睡眠 颈椎病 儿童睡眠

推广链接

枕头榜中榜→权威品牌网
时时最新！告诉你枕头行业的十大品牌排行榜，查询枕头品牌，就在权威品牌网（China.qw.com）。
www.china.qw.com/advertising... 76% 赞

【枕头】正品枕头，品牌为你直供!
热门品牌：爱一 莽芯 暖阳 水丽丝 天之骄蚕
价格区间：0-99 100-199 200-299 300-399
www.marketzt.cn/ 89% 赞

权威测评，2015枕头榜 热销榜单
权威测评，大牌聚集，品质保证，年底大促销！五十万用户好评，满额包邮...
www.gougoushopping.net 2015-12 88% 赞

10

查查 CHACHA 新闻 网页 知了 图片 音乐 地图 科普 更多> 反馈 设置 登录

毛笔 X 查查一下

查查推荐： 毛笔的分类 毛笔的材料 毛笔的制作 毛笔字帖 下一批

【毛笔】热购网 精品特惠购！
品牌： 爱林轩 紫竹堂 竹雅 轼洵一品 湖涟聚
关键字： 狼毫 兔毫 羊毫 狐毫 硬毫 软毫


纯狼毫毛笔硬豪专用
参考价格： 67元

精品兔毫笔初学入门
参考价格： 89元


特价高档羊毫精品套装
参考价格： 128元

点击查看更多关于“毛笔”的物品
ai.hotshop.com 2015-12-28

毛笔 查查图片 – 举报图片



image.chacha.com

查查搜索 安全快速 ·

相关查查 展开

热点关注	关注度
毛笔的选购标准	★★★★★
初级毛笔字贴	★★★★★
文房四宝是什么	★★★★★
文房四宝名品	★★★★★
毛笔绘画	★★★★★

查查榜中榜 展开

排名	热搜趋势
1. 湖笔	↑
2. 狼毫	↓
3. 狐豪	↑
4. 兔毫	↓
5. 安徽宣纸	↑
6. 端砚	↑
7. 贡墨	↑

11

查查 CHACHA 新闻 网页 知了 图片 音乐 地图 科普 更多> 反馈 设置 登录

坦克 X 查查一下

查查推荐： 3D坦克 坦克模型 坦克世界 坦克图片 下一批

坦克 查查图片 – 举报图片



image.chacha.com

《坦克大战》- 官方网游 – 热血和激情并存的战争网... 官网


火爆全球的坦克战争游戏！《坦克大战》最新版正式启动！ 高精准的场地设计，全仿真的军事坦克震撼登场！叫上你的朋友上演巅峰对决！

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查查搜索 安全快速 ·

坦克历史我知道 展开

史上自毁坦克的事件及起因	- 查查问答
美苏坦克事件	- 查查空间
坦克的诞生史	- 万答科普
世界坦克发展历史	- 查查知了
史上相关坦克的历史事件	- 查查图片
有关坦克的奇异事件	- 潮汐搏客

中国军事热搜榜 展开

热点关注	关注度
南京大屠杀	★★★★★
五四运动	★★★★★
七七事变	★★★★★
辛亥革命	★★★★★
九一八事变	★★★★★

12

查查 CHACHA 新闻 网页 知了 图片 音乐 地图 科普 更多> 反馈 设置 登录

羽毛球 X 查查一下

查查推荐： 世锦赛 林丹 羽毛球规则 羽毛球赛标准 下一批

关于“羽毛球”的最新相关消息

[羽毛球]锦标赛 上海苦战险胜太原 中国体坛网 58分钟前
羽毛球价位上涨，业余球友自嘲捡球打 中国民间 2小时前
世界羽毛球冠军林丹开副业！餐馆饭店一把抓 体娱网 4小时前
国家羽毛球队的新红包！运动器械大馈赠 青年网 12小时前
冠军叫你打羽毛球敢去吗？国羽队“吓到”民间 体育八卦 15小时前

羽毛球 查查科普 欢迎编辑

羽毛球是一项室内外兼顾的运动，可分为单打与双打。羽毛球运动通常由羽毛球和羽毛球拍组成。随着科学技术的发展，羽毛球和球拍的材质也在发生着变化。由于使用力道，习惯方位等不同可特殊定制达到羽毛球和其球拍的最佳使用效果。
现代羽毛球运动始于英国，一种隔网拍打毽球的运动..... 详情>>
kepu.chacha.com - 查查搜索
其它资源：互动探秘 科技之窗 我爱发明

查查搜索 安全快速 ·

推广

“铮铮杯”羽毛球争霸赛全国海选中！想知道自己羽毛球有多厉害吗？想知道自己在全国羽毛球业余选手中的排名吗？第2届“铮铮杯”热烈欢迎您！
www.yeyuymq.game.com

相关查查排行榜 展开

排名	热搜趋势
1. 足球	↑
2. 篮球	↓
3. 乒乓球	↑
4. 羽毛球	↓
5. 体操	↑
6. 柔道	↑ 13

查查 CHACHA 新闻 网页 知了 图片 音乐 地图 科普 更多> 反馈 设置 登录

地球 X 查查一下

查查推荐： 宇宙 太阳系 月球 人造卫星 火星 下一批

地球 查查科普 欢迎编辑

地球（英文：Earth）属于太阳系八大行星系列（原为九大行星后冥王星被除名）按照距离太阳的远近程度排位第三颗行星。 地球有一颗天然的卫星，月球..... 详情>>
历史研究 历史记载 天圆地方 全部－其他含义>>
kepu.chacha.com - 查查搜索
其它资源：互动探秘 科技之窗 我爱发明

关于“地球”的最新相关消息

当太阳被压缩到直径10米，地球只有柠檬大小 科技联盟 23分钟前
你知道吗？！当太阳系被整体压缩，太阳压缩到直径10米的圆球，除木星，土星，天王星，等气态行星相对比较大之外，金、火、水星和地球都成了小不点！只有柠檬大的地球和.....
最新黑洞研究发现：距离地球14000光年外有黑洞数据 新闻摘要 3小时前
流星雨又要来啦！狮子座流星雨又将经过我国大陆上空 天文网 9小时前
从外太空看地球！给你看最美的地球 查查新闻 12小时前
科学家预计在2030年实现火星登陆 天文前沿 20小时前

查查搜索 安全快速 ·

相关查查 展开

热点关注	关注度
太阳系八大行星	★★★★★
冥王星被除名	★★★★★
地球、月球和潮汐	★★★★★
金木水火四大行星	★★★★★
历史上的地球大事件	★★★★★

推广

精品地球仪特价优惠！
100元起
科技早教
ad.chacha.com 14

查查 CHACHA 新闻 网页 知了 图片 音乐 地图 科普 更多> 反馈 设置 登录

香皂 X 查查一下

查查推荐： 香皂的种类 香皂花 早期皂角 香皂配方 下一批

香皂 搜搜科普 欢迎编辑

作为一种不可缺乏的日用洗涤产品，香皂，的使用历史可以一直追溯到公元前。我国从八十年代开始引进并逐渐广泛的使用香皂。古时候的人们采摘皂荚捣碎后加入其它香料进行泡浴。这中方法是至今所致比较古老的香皂雏形。
现今制造向左主要以脂肪酸纳和其它便秘活性剂为主要原料...详情>>
简单介绍 主要成分 发展历史 全部
kepu.chacha.com
其它资源：互动探秘 科技之窗 我爱发明

关于香皂的最新消息
你会用香皂洗脸吗？ 查查知了

2015年12月20日新科网报道 - 过去很多人们相信弱碱性的洗脸香皂是对皮肤有伤害的，所以对洗脸香皂有一种排斥心理。同时，许多过去的广告大肆宣传弱酸性洗漱用品对皮肤的好处从而继续“抹黑”了洗脸香皂的作用。然而最新消息表示，弱碱性的洗脸香皂其实对我们的皮肤不但没有伤害反而...
www.xinkenews.com/article/...html - 查查快照

查查搜索 安全快速

香皂的用途 展开


洗澡


洗头


洗脸

推广

香皂品牌榜中榜！买精品香皂→爱购商城
爱购商城让你一站购齐所有精品！海量选择就在爱购商城！
www.lovegou.com
欧美爱时尚化妆品 满足你的魅力需求
提供最时尚的欧美化妆品，让你摆脱卑微，重获自信！
www.omshop.com
制作自己的香皂去哪里？艾玛手工香皂欢迎您！
提供最新设备，低价原料，多种选择，让你制作独家香皂产品！
www.handmaking.cn

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查查 CHACHA 新闻 网页 知了 图片 音乐 地图 科普 更多> 反馈 设置 登录

足球 X 查查一下

查查推荐： 世界杯 贝克汉姆 国足 世界锦标赛 中国足联 下一批

AG 爱购网 – 足球相关宝贝购不停！ 推广
爱购网，足球狂粉，足球爱好者的家园！想要得到就来爱购网！中国最大网上购物平台！
明星海报 签名球鞋秋衣 比赛门票 门将手套 比赛足球
www.aigo.com

1 足球第一时间 – 邀您在线一起观球！
全国首创在线足球直播网站，邀您一同呐喊，一同观球，让我们一起把握每个精彩足球瞬间！
国足视频 英超视频 亚洲杯视频 世界杯视频 精彩一瞬
www.firstseond.cc

关于“足球”的最新相关消息

英超再起风云 利物浦大战曼联 体坛风云 3小时前
中国足联终发威！掀起亚洲体坛变革 中国足球 8小时前
AC米兰大事记 国际体坛 12小时前
体坛新动向 列国体坛新星大盘点 中外体育 16小时前
中国足球新力量！足球从小培养 体育力量 20小时前
足球体校？改不改办？ 中国青少年网 22小时前

查查搜索 安全快速

查查体育 展开


篮球


排球


乒乓球

“足球”相关明星 展开


弗拉米尼·阿森纳


拉斐尔·范德法特

马蒂亚·德西利奥

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查查 CHACHA 新闻 网页 知了 图片 音乐 地图 科普 更多> 反馈 设置 登录

购物 X 查查一下

查查推荐： 电视购物 实体店 电商 网上购物 名品代购 下一批

查查搜索 安全快速

购物 搜搜科普 欢迎编辑

购物（英文：shopping），大众常用“血拼”作为英文的近音俗称。购物主要指在零售商处条件选购的行为。其或可视为一种普遍的经济休闲活动。购即为买，物则代指所售货品。购物此行为为男女老少所共有..... 详情>>

基本简介 购物行为 购物平台 全部 其他含义>>

kepu.chacha.com

其它资源：互动探秘 科技之窗 我爱发明

推广

2015网上购物新干线！ 来易购，方便快速！

新干线购物网，一站式购齐您所需，即购即付即发货！在线购物，就来新干线！

www.newgx.com

GS全球购物！名品免税！

高端名品，衣饰、鞋帽、美妆就在GS全球购，只要你想要这里就蛮子您的需求！

www.gshopping.com

关于“购物”的最新相关消息

年节购物大潮开始！各大超市紧急存货

近前网 2015-12-27 11:48

又是临近年假的热闹人潮，据各地方报道，各大超市整紧锣密鼓的为年节假前的购物大潮做准备，务必确保在人流拥挤的大潮期间保证货品质量，购物安全，保障消费者的合法权益.....

香港为吸引内地购物潮流 重整规划条例 港澳网	3小时前
成都、太原、重庆等地试实行旅客机场退税政策 中国经济	7小时前
线上线下购物通！部分城市大商家实行新措施 商报	9小时前

相关查查 展开

热点关注	关注度
热门购物网站	★★★★★
中国免邮官网	★★★★★
全球代购网站	★★★★★
如何开网店	★★★★★
网店要不要交税	★★★★★

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查查 CHACHA 新闻 网页 知了 图片 音乐 地图 科普 更多> 反馈 设置 登录

月亮 X 查查一下

查查推荐： 中秋节 实体店 电商 网上购物 名品代购 下一批

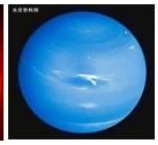
查查搜索 安全快速

月亮 查查图片 – 举报图片

image.chacha.com

查查热搜星球 展开

太阳



水星

火星

相关查查排行榜 展开

排名	热搜趋势
1. 太阳	↑
2. 月亮	↓
3. 地球	↑
4. 冥王星	↓
5. 水星	↑
6. 火星	↑
7. 木星	↓
8. 土星	↓
9. 金星	↓

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推广

护家网 – 购买你的日用家化！

购买家化领导品牌：元月亮，保清，爱护肤等等名牌正品就来护家网！护家网，保护你，保护你的爱人，保护你的家！

www.carehome.com

四叶洗护 专业保障

专供各种名牌洗护用品：如月，月亮情，肤爱等专业护肤品牌，特惠在即，欢迎选购！

www.4leaves.com

WeKnow+ 搜索 图片 新闻 百科 邮箱 视频 更多 登录

WeKnow 老虎 X

全部 图片 新闻 百科 邮箱 视频 更多 搜索工具

找到相关结果约为8,374,082个（用时 0.57秒）

相关搜索： 老虎游戏 动物世界 老虎王 老虎与狮子

老虎的图片搜索结果 举报图片



有关“老虎”的更多图片

老虎 - WeKnow百科

baike.weknow.com/view/19372.htm

老虎（英文： tiger; 俗称：虎、大虫），是现存体型最大的猫科动物。据称，老虎体长可达4米（12尺），重为400公斤（约880磅）。作为食肉的哺乳类动物，老虎有敏锐的听力、夜视能力，可自由伸缩的尖爪和利齿以及发达的运动神经让老虎能够快速的捕获猎物。老虎的先出特征就是在其白色或橘红色的毛皮上有垂直的条纹，这有利于老虎在伏击猎物时更好的隐蔽在树林里……

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宠物店

地址：青岛古乐街32号

电话：+864 4832 9922

此商家拥有所有权

评论 评价

快来抢先评价吧

查看关于一下查新的搜索结果：

虎（动物）

上一级分类：猫科

英文：Tiger 19

WeKnow+ 搜索 图片 新闻 百科 邮箱 视频 更多 登录

WeKnow 游乐园 X

全部 图片 新闻 百科 邮箱 视频 更多 搜索工具

找到相关结果约为10,337,983个（用时 0.37秒）

相关搜索： 游乐园相关电影 游乐园上海 游乐园设施

游乐园团购大全 热门游乐园新春特价

http://www.hongkongdisneyland.com/zh-hk/.....



梦幻海洋游乐园... 100元 ~~120元~~

童梦游乐园... 110元 ~~150元~~

水上漂游乐园... 118元 ~~140元~~

新闻报道

“科技游乐园”为各地中小学生送上寒假科技大餐

民生民聊 – 12小时前

民生民聊网最新消息，多地政府联合当地企业举办了多种“科技游乐园”活动。希望借此为放假在家的中小学生的寒假生活再添一道科技大餐。据悉……

更多关于“游乐园”的新闻

用户还搜索了：

海盗船

过山车

查看关于下一查看的搜索结果：

室内儿童乐园

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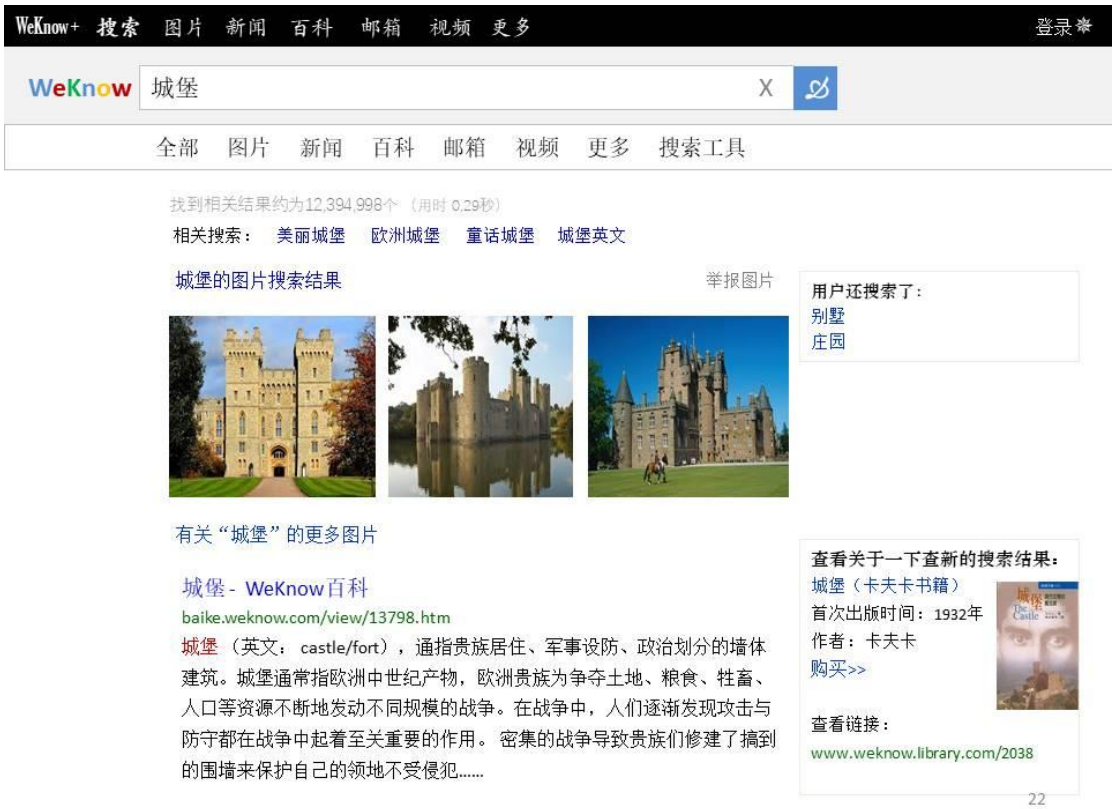
WeKnow+ 搜索 图片 新闻 百科 邮箱 视频 更多 登录
WeKnow 元宵 X
全部 图片 新闻 百科 邮箱 视频 更多 搜索工具
找到相关结果约为12,398,800个 （用时 0.39秒）
相关搜索： 灯会 正月十五 七天乐 元宵的种类
元宵的图片搜索结果 举报图片
用户还搜索了：
元宵的做法
元宵的意义
有关“元宵”的更多图片
中国历届元宵晚会视频点播页面_优影网（www.youying.com）
yuanxiao.youying.com/index.html
历届元宵晚会节目视频。
2015- 歌曲《我爱我家》 演唱：金康
歌曲《婆婆妈妈》 演唱：廖广
小品《天上地下》 表演：潘兴张蕾
歌曲《每天都过年》 演唱： 安恬天
歌曲《甜在心里》 演唱：董甜甜
查看关于下一查看的搜索结果：
水饺
包子
面条
21


WeKnow+ 搜索 图片 新闻 百科 邮箱 视频 更多 登录
WeKnow 城堡 X
全部 图片 新闻 百科 邮箱 视频 更多 搜索工具
找到相关结果约为12,394,998个 （用时 0.29秒）
相关搜索： 美丽城堡 欧洲城堡 童话城堡 城堡英文
城堡的图片搜索结果 举报图片
用户还搜索了：
别墅
庄园
有关“城堡”的更多图片
城堡 - WeKnow百科
baike.weknow.com/view/13798.htm
城堡（英文： castle/fort），通指贵族居住、军事设防、政治划分的墙体建筑。城堡通常指欧洲中世纪产物，欧洲贵族为争夺土地、粮食、牲畜、人口等资源不断地发动不同规模的战争。在战争中，人们逐渐发现攻击与防守都在战争中起着至关重要的作用。 密集的战争导致贵族们修建了搞到的围墙来保护自己的领地不受侵犯……
查看关于一下查新的搜索结果：
城堡（卡夫卡书籍）
首次出版时间：1932年
作者：卡夫卡
购买>>
查看链接：
www.weknow.library.com/2038
22

WeKnow+ 搜索 图片 新闻 百科 邮箱 视频 更多 登录

WeKnow 旅游 X

全部 图片 新闻 百科 邮箱 视频 更多 搜索工具

找到相关结果约为1,741,031个 （用时 0.46秒）

相关搜索： 旅游攻略 自助游 自驾游 欧亚旅游景点

欧旅 欧洲旅游 -europelvyou.net

广告 www.europelvyou.net/

数十个欧洲国家接机服务，无会员无隐形消费，数十旅游城市接送，全球统一定价

全球机票

欧旅机票享誉全球，每年服务上百万国人，众多航空公司代理，特价机票随时有

欧洲旅游

欧旅欧洲旅游欧洲数十机场接机服务，旅游城市低价接送，无会员制，无隐形消费

最近节假日：

除夕
2016年2月7日

新闻报道

济南元旦小长假旅游收入40.21亿元

齐鲁新闻网 – 6小时前
齐新网1月3日报道（记者王吉）记者3日从济南市旅游局了解到，元旦小长假，济南市共接待国内外游客485.01万人次，实现旅游收入40.21亿元，与……

年终快报：伊拉克旅游业复兴
世界通 - 12小时前

更多关于“旅游”的新闻

查看关于一下查新的搜索结果：
旅游
释义：旅行游览活动
英文：Travel

23

WeKnow+ 搜索 图片 新闻 百科 邮箱 视频 更多 登录

WeKnow 狮子王 X

全部 图片 新闻 百科 邮箱 视频 更多 搜索工具

找到相关结果约为16,337,879个 （用时 0.36秒）

相关搜索： 非洲雄狮 狮王 狮虎兽 狮子王歌曲

新闻报道

南非狮子王再次为父共有六只子女

动物大世界 - 9小时前
近日，南非开普敦的国家公园内一头叫彗星的雄狮再次拥有了三名子女。据统计，彗星已经年近不惑却已是六只小狮子的父亲。 而且，领动物园方面震惊的是，这头狮王的……

充满童年的味道，曾经的狮子王糖果
民生童趣网 – 12小时前

YR 《狮子乐乐》动画电影免费在线！优然网，视频高清在线观看

www.youran.com/show_page/id_zw……html

狮子乐乐动画电影在线观看…… 电影狮子乐乐 2016年上映。 别名： The Lion Named Happy/狮子乐乐 3D 时长88分钟 优然上映2015-11-22

用户还搜索了：
动画电影
国产动画电影

演员表 超过五项

詹姆斯厄尔·琼斯

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WeKnow+ 搜索 图片 新闻 百科 邮箱 视频 更多 登录
WeKnow 象棋 X
全部 图片 新闻 百科 邮箱 视频 更多 搜索工具
找到相关结果约为4,000,100个 （用时 0.44秒）
相关搜索： 军棋 五子棋 围棋 棋谱 棋子饼 国际象棋
象棋的图片搜索结果 举报图片
大家来玩中国象棋
wwww.88games.com> 益智游戏
有关“象棋”的更多图片
新闻报道
济南打造世界象棋文化之都：三方合作弘扬象棋文化
齐鲁民生 – 2小时前
齐民网1月4日报道（记者李天天）济南市人民政府联手中国象棋协会山东旅游发展有限公司顺利签订协议，共同打造齐鲁象棋文化……
查看关于下一查看的搜索结果：
围棋比赛
象棋国手
更多关于“象棋”的新闻
25


WeKnow+ 搜索 图片 新闻 百科 邮箱 视频 更多 登录
WeKnow 乒乓球 X
全部 图片 新闻 百科 邮箱 视频 更多 搜索工具
找到相关结果约为8,970,000个 （用时 0.55秒）
相关搜索： 羽毛球 篮球 排球 保龄球 网球 橄榄球
乒乓球的图片搜索结果 举报图片
用户还搜索了：
世界杯乒乓球赛
乒乓球国家队
有关“乒乓球”的更多图片
新闻报道
青岛少儿乒乓球年度总决赛即将举行
青岛早知道 – 12小时前
昨天， 2015“乒乓骄傲杯”青岛市少儿乒乓球年度总决赛在体育场谢幕。来自全省各市区县的300多名12岁以下的少儿乒乓球选手参加了该比赛，共有15名进入昨天的最后总角逐……
教你玩乒乓！就来爱玩网
wwww.aiwan.com> 休闲游戏
更多关于“乒乓球”的新闻
26

广知搜索 新闻 网页 知乎 视频 地图 求答 更多 登录

狐狸 X 广知搜索

广知推荐： 九尾狐 狐仙 白狐 狐狸精 妖狐

太极☯八卦，斩妖除魔！ 纵横三界就在堕仙网!

一等座驾：九尾妖狐（幼兽）
价格:3800金币
属性：风、雷
适用等级：初级魔法师、中级战士
查看全部属性>>

一等座驾：九尾妖狐（成兽）
价格:5800金币
属性：风、雷、火
适用等级：中级魔法师、高级战士
查看全部属性>>

堕仙简介 购买点券 初级装备 终极装备 详情>>
来自广知游戏平台
www.zhuixian.com – 2016-1-1

狐狸 - 广知科普
狐狸： 食肉犬科哺乳动物。喜食鱼、蛙、虾、蟹、鼠类、昆虫、鸟类及其他小型动物。其食谱中也包括部分植物的果、叶、根部。其种类繁多，分为北极狐、赤狐、银黑狐。狐狸性格机敏，常代指狡猾的人.....
生活环境 种属分类 外形特征 详情>>
看看更多狐狸的释义>>
广知科普 - kepu.guangzhi.com/v..... 2015-01-12

相关生物 展开



北极狐 黄鼬 狸

热议话题 展开

关键字	热度
狐狸的皮毛颜色	5
狐狸和葡萄的故事	4
养狐狸的方法	4
狐狸在中国的分布情况	3
狐狸和猫的区别	2
狐狸能活多久	1

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广知搜索 新闻 网页 知乎 视频 地图 求答 更多 登录

猫 X 广知搜索

广知推荐： 汤姆猫 加菲猫 猫和老鼠 黑猫警长 猫的品种类

猫 广知图片



相关搜索： 猫的简笔画 猫头像 卡通猫 机器猫 猫美图 猫和老鼠 波斯猫 狸猫
pic.guangzhi.com/p.....2016-1-2 查看全部图片

少儿动画片 展开

猫的最新相关消息
蹭车“耗子”称霸火车站 安检是“猫”大显神威
民情网 4小时前
据记者报道，日前 天津火车站内聚集了30多名自称铁路系统内部职员的“车耗子”， 他们通常两三人一组，分布在车站各个角落招揽客人。执法人员获悉此事，马上.....

“板脸猫”走红网络 天天网红	5小时前
2015爱宠大比拼：猫狗选美大赛 万科新闻	12小时前
猫抓老鼠是天性？宠物猫的现状 民生民晓网	14小时前

动物排行榜 展开

1. 狗	★★★★★
2. 猫	★★★★☆
3. 猴子	★★★★☆
4. 狮子	★★★☆☆

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广知搜索 新闻 网页 知乎 视频 地图 求答 更多 登录

茶叶 X 广知搜索

广知推荐： 茶叶知识 生茶 熟茶 茶叶的分类 清肠茶

茶叶 - 广知科普

茶叶，通常指茶树的叶子或幼芽。通常所饮用的茶叶就是用茶树的叶子和幼芽通过采摘、挑拣、晾晒和烘烤制成的用开水直接冲泡的饮品。茶说双子叶植物，现今所知的茶叶有约30个属，500个种类，多分布于热带和亚热带地区.....

历史记载 种属分类 分布地域 详情>>

广知科普 - kepu.guangzhi.com/v..... 2015-10-21

大家在看 展开

关键字	热度
茶叶的减肥功效	5
茶叶的用途	4
茶叶的种类	3
如何制茶叶	2
茶叶水洗脸	1

茶叶（共170.3万款）全网比价 - 广知比价

润安 东亭铁观音茶叶礼盒清香型高档送礼佳品...
¥128 广发

买一送一！清新绿茶!茶叶采自无污染沂蒙山.....
¥88 天鹿

2015新上龙井茶！新年在即，送礼选茶叶.....
¥118 茶韵

浏览更多茶叶相关商品>>
bijia.guangzhi.com－2015-12-27

茶叶排行榜 展开

1. 绿茶	★★★★★
2. 正山小种	★★★★★
3. 龙井	★★★★★
4. 碧螺春	★★★★★
5. 毛尖	★★★★★
6.普洱	★★★★★

29

广知搜索 新闻 网页 知乎 视频 地图 求答 更多 登录

雾霾 X 广知搜索

广知推荐： 北京雾霾 雾霾图片 雾霾原因 雾霾危害 雾霾城市

雾霾 - 广知科普

雾霾（英文：Fog and Haze），或称灰霾、烟霞等，是雾和霾的统称，是一种近几年才出现的天气现象。雾霾指的是空气中的杂质，例如灰尘、硫酸、硝酸、有机谭清华和我等大量极细微的干尘粒子均匀的漂浮在空气中，使其浑浊，导致视野模糊可见度恶化等危害。中国不少地区已经将雾霾天气作为灾害性天气进行天气预警预报.....

基本简介－组成成分 - 形成原因－已知危害

广知科普－kepu.guangzhi.com/v.....； 2015-12-29

相关灾害天气 展开

光化学烟雾

沙尘暴

雾霭

雾霾的最新相关消息

雾霾的产生预计打压我国的经济转型，需当断则断的治理

中国民声 2小时前

据记者报道，目前的雾霾阴魂不散现象仍然在持续中，甚至有进一步扩大的趋势，天气预报总局预计在元旦小长假后的首个工作日继续在全国十数个重工业城市发布雾霾橙色预警.....

年底雾霾将持续霸占各大头条 万答新闻	5小时前
年末辟谣：吃水果不能排除雾霾毒 广知新闻	12小时前
雾霾时期该不该通风？ 生活告诉你	14小时前
出门戴口罩管用吗？雾霾天的策略 广知生活帮	15小时前
治理雾霾成本月搜索关键词榜首 广知排行榜	18小时前

推广

高级儿童口罩过滤式防颗粒物.....
¥30 护家
www.huajia.com

30

广知搜索 新闻 网页 知乎 视频 地图 求答 更多 登录

登山 广知搜索

广知推荐： 登山作文 爬山 攀岩 登山运动 登山驴友

登山 广知图片



相关搜索： 登山图片大全 登山户外运动图片 登山素材 登山风景 登山壁纸

pic.guangzhi.com/p.....2016-1-4 查看全部图片

相关运动 展开



蹦极 滑雪 攀岩

登山 - 爱鲁旅游指南

爱鲁旅行社盛情推出山东登山旅游景点，最新出行攻略和旅游团信息。除登山外，爱鲁旅行社还组织有齐鲁文化八日游，泰山三日游，蓬莱仙岛一日游等系列优惠旅行团计划，欢迎进一步咨询！

鲁ICP证010022号 酒店 团购 国际酒店 公寓式宾馆预订

爱鲁旅行社 – trip.ailong.com/t..... - 2015-12-30

大家在看 展开

关键字	热度
登山的好处	5
登山的注意事项	4
登山路径的选择	3
老人能不能登山	2
小孩登山注意事项	1

31

广知搜索 新闻 网页 知乎 视频 地图 求答 更多 登录

眼镜 广知搜索

广知推荐： 太阳镜 近视眼镜 防辐射眼镜 框架眼镜 隐形眼镜

OHO眼镜连锁店，网上配镜第一选择

OHO全国连锁眼镜店，提供各大品牌眼镜框架，近视镜片，防辐射眼镜，隐形眼镜，安全美瞳，近视墨镜，偏光太阳镜等多种眼镜，满足您对镜框和镜片的不同需求！ 100%正品保证，网上下订单，当日发货！

www.oho.com –1天前

眼镜的最新相关消息

专家建议：雾霾尽量不要带隐形眼镜，多眨呀有助于保护眼睛

民生网 7小时前

据记者报道，最近有科研部门做了权威实验表明，雾霾天隐形眼镜上的菌落比例高出平时的12倍还多。在此，权威眼科医院医生特别提醒，就持续多日的重霾天气，进行室外活动的同事请不要佩戴隐形眼镜.....

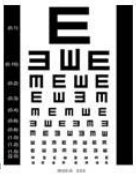
隐形眼镜有吸附性，雾霾天最好别戴 万科知了 5小时前

隐形眼镜危害多，戴隐形眼镜时应注意什么？ 健康咨询 12小时前

戴隐形眼镜可感染寄生虫或导致失明 民晓网 14小时前

相关词汇 展开





配镜 视力测试 视力表

大家在看 展开

关键字	热度
隐形眼镜的危害	5
怎样挑选镜片	4
太阳镜的挑选	3
游泳时能戴隐形眼镜吗	2
隐形眼镜的好处与坏处	1

32

广知搜索 新闻 网页 知乎 视频 地图 求答 更多 登录

游泳 X 广知搜索

广知推荐： 蛙泳 自由泳 蝶泳 游泳眼镜 仰泳

游泳 广知图片



相关搜索： 游泳图片大全 游泳卡通 游泳卡通图片大全 游泳指导图 儿童游泳

pic.guangzhi.com/p……2016-1-3 查看全部图片

游泳的最新相关消息

喜迎元旦，惠天县游泳协会举办冬泳比赛

山西频道 8小时前

据记者报道，山西惠天县游泳协会在启路径上全山庄举办动用比赛喜迎元旦活动，以冬泳人独特的方式应届元旦的到来。男女老少齐聚比赛现场为各位选手加油鼓劲。参赛选手们劈波斩浪，你追我赶个个信心十足，凭借良好的水性和精湛的技艺赢得了观众们的一致喝彩…

2016新年新愿望：我要实现游泳梦 民间民声 5小时前

热搜排行榜 展开

仰泳	5
蝶泳	4
自由泳	3
蛙泳	3
花样游泳	2
混合泳	1

33

广知搜索 新闻 网页 知乎 视频 地图 求答 更多 登录

火车 X 广知搜索

广知推荐： 动车 电力机车 蝶泳 火车票 火车站

火车 - 广知科普

火车（英文：Train），是一种比较普遍的交通工具。火车起源于蒸汽汽车，而第一台蒸汽汽车有由英国的矿山技师结合蒸汽机于1804年制造而成，当时的时速约为5至6公里每小时。由于当时的火车主要依赖煤炭或木柴作为原料，所以人们称其为“火车”，这个名称被一直沿用至今。后来……

火车简介 – 历史由来 - 历史变革 – 制造原理

看看更多火车的释义>>

广知科普 - kepu.guangzhi.com/v…… 2015-11-18

火车的最新相关消息

济南火车南站元旦小长假期间共发送旅客10.5万人次

齐鲁之声 12小时前

据铁道部统计，今年元旦小长假济南南站工发送各地旅客约为10.5万人次，较去年同期增长了12%。为了方便旅客的出行，济南火车站继续加开济南至北京、青岛、哈尔滨等地的往返动车组……

河南男子逃火车票被列车员警告后补票 广知资讯 13小时前

从火车发展史看中国的经济奇迹 经济之声 17小时前

我国的火车发展史：从无到有到最先进的光荣史 华盛网 21小时前

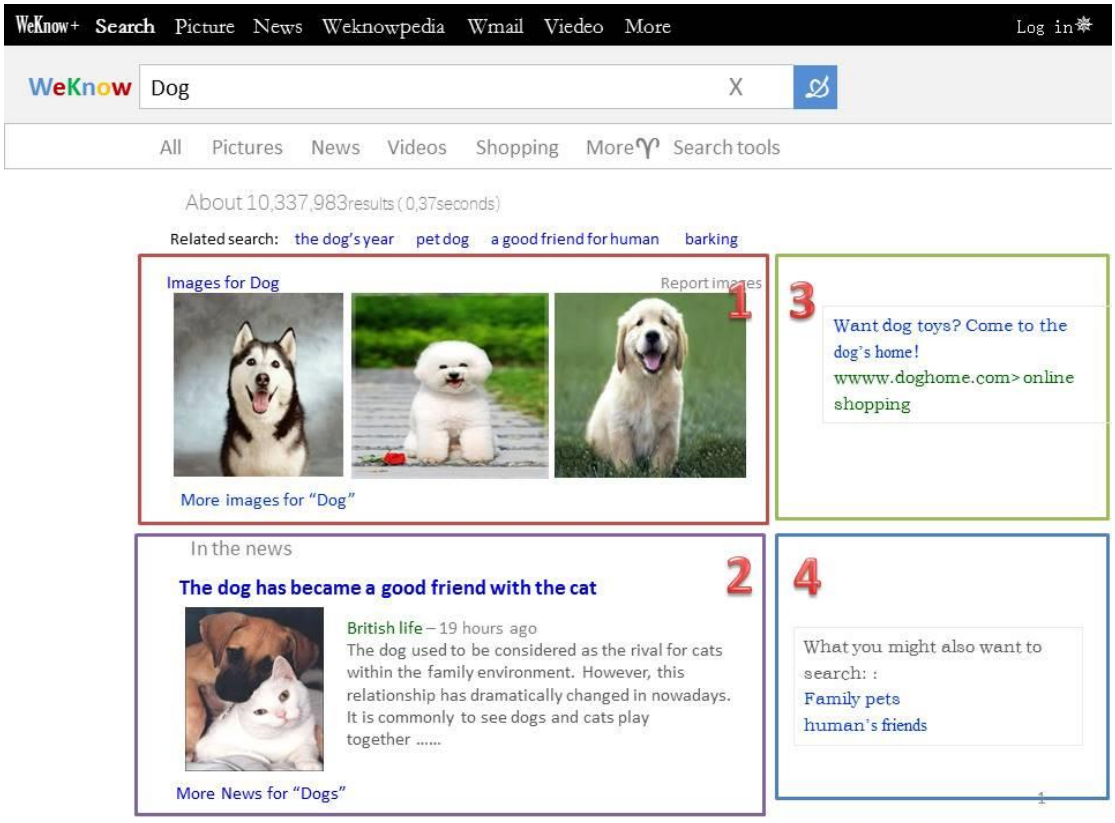
火车类型 展开

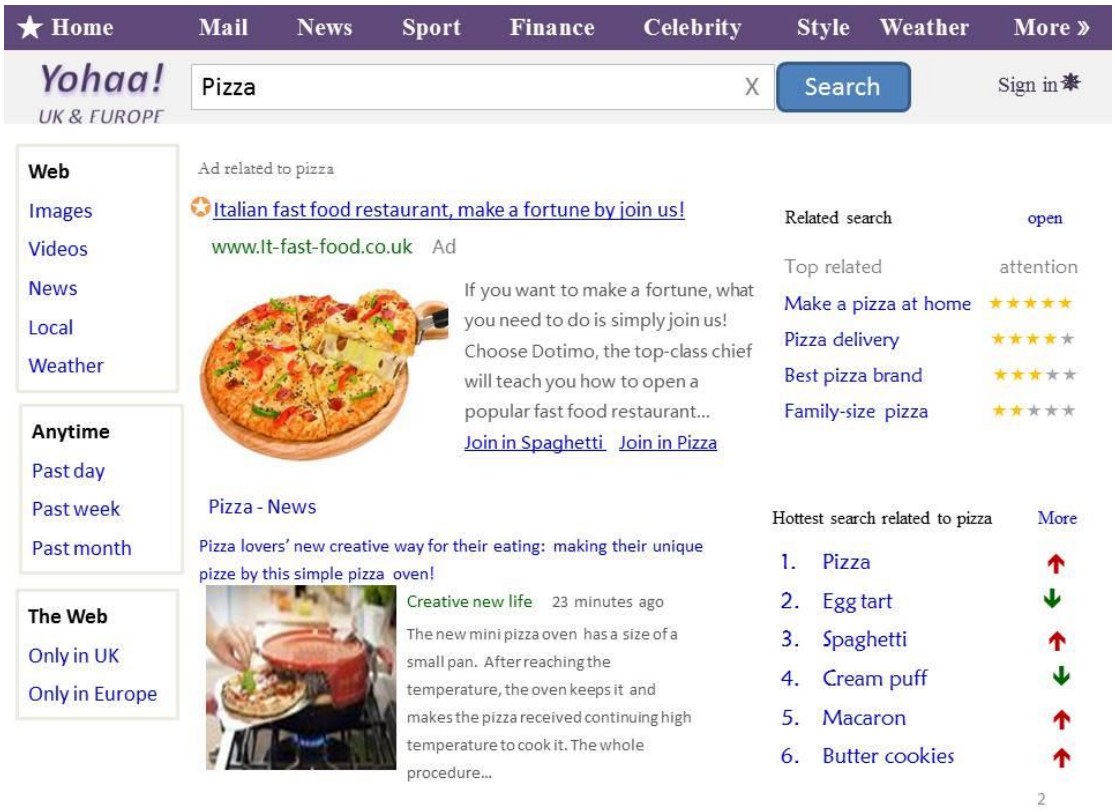


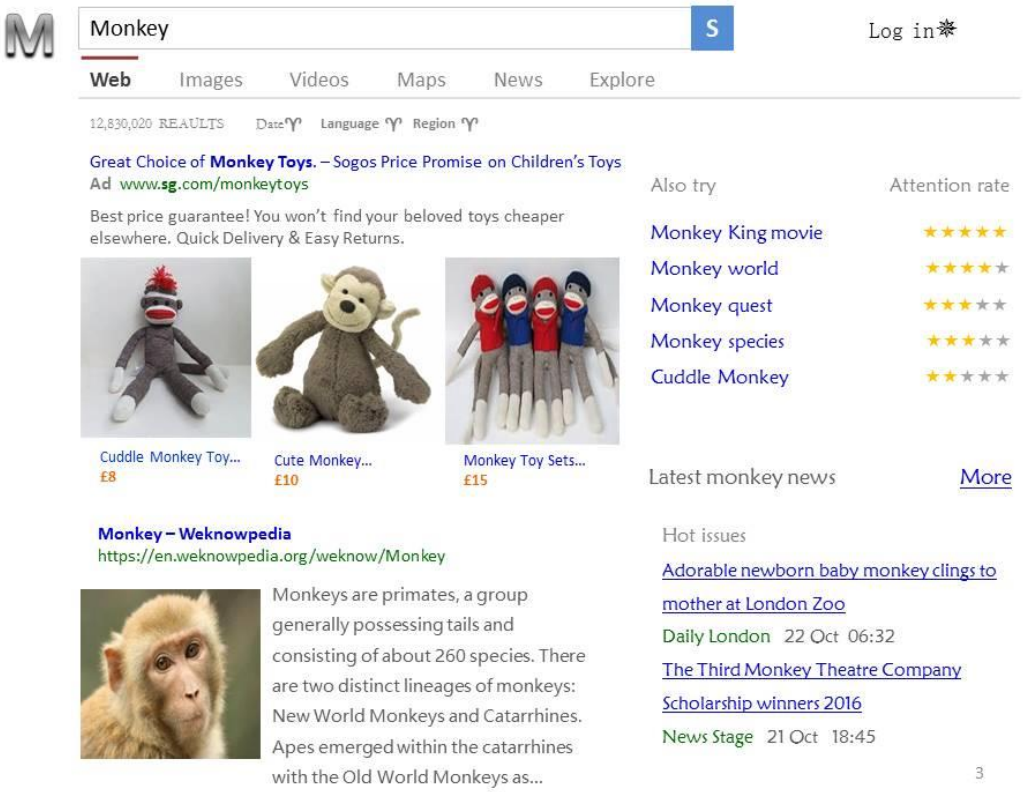
动车 电力火车 蒸汽火车

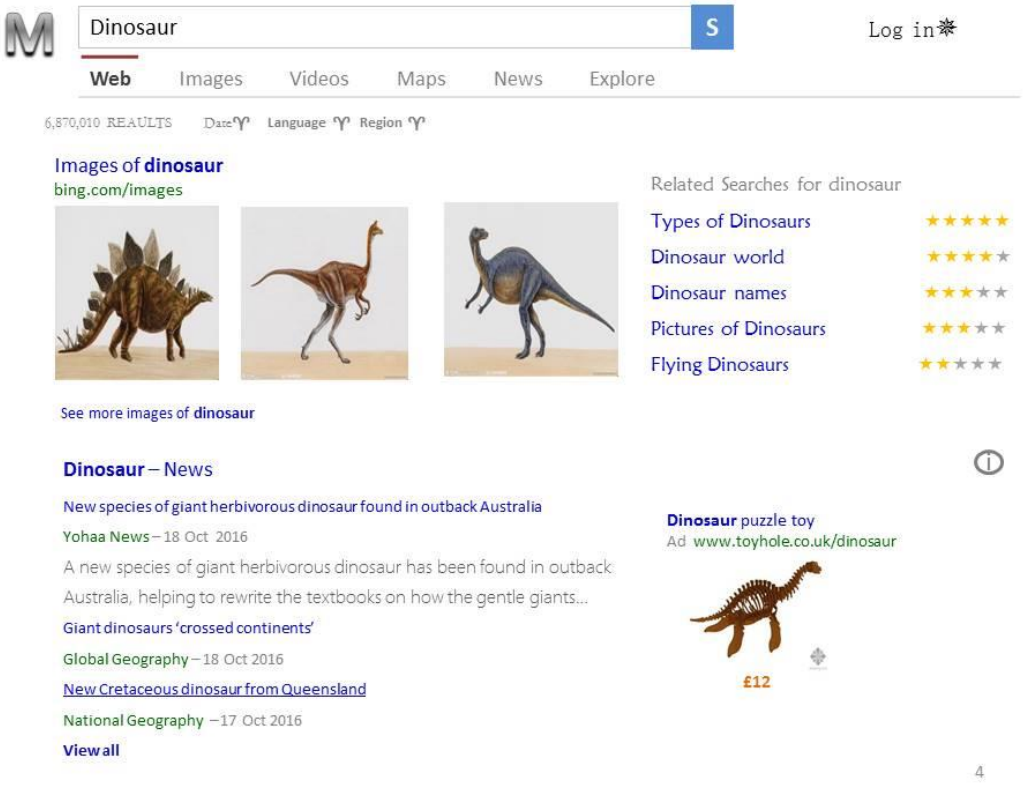
34

APPENDIX B. WEB PAGES FOR STUDY 4






Monkey
S
Log in
Web
Images
Videos
Maps
News
Explore
12,830,020 REAULTS
Date
Language
Region
Great Choice of Monkey Toys. – Sogos Price Promise on Children's Toys
Ad www.sg.com/monkeytoys
Best price guarantee! You won't find your beloved toys cheaper elsewhere. Quick Delivery & Easy Returns.
Cuddle Monkey Toy...
£8
Cute Monkey...
£10
Monkey Toy Sets...
£15
Also try
Attention rate
Monkey King movie
Monkey world
Monkey quest
Monkey species
Cuddle Monkey
Latest monkey news
More
Monkey – Weknowpedia
https://en.weknowpedia.org/weknow/Monkey
Monkeys are primates, a group generally possessing tails and consisting of about 260 species. There are two distinct lineages of monkeys: New World Monkeys and Catarrhines. Apes emerged within the catarrhines with the Old World Monkeys as...
Hot issues
Adorable newborn baby monkey clings to mother at London Zoo
Daily London 22 Oct 06:32
The Third Monkey Theatre Company Scholarship winners 2016
News Stage 21 Oct 18:45
3


Dinosaur
S
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Images
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Maps
News
Explore
6,870,010 REAULTS
Date
Language
Region
Images of dinosaur
bing.com/images
Related Searches for dinosaur
Types of Dinosaurs
Dinosaur world
Dinosaur names
Pictures of Dinosaurs
Flying Dinosaurs
See more images of dinosaur
Dinosaur – News
New species of giant herbivorous dinosaur found in outback Australia
Yohaa News – 18 Oct 2016
A new species of giant herbivorous dinosaur has been found in outback Australia, helping to rewrite the textbooks on how the gentle giants...
Giant dinosaurs 'crossed continents'
Global Geography – 18 Oct 2016
New Cretaceous dinosaur from Queensland
National Geography – 17 Oct 2016
View all
Dinosaur puzzle toy
Ad www.toyhole.co.uk/dinosaur
£12
4

Panda S Log in

Web Images Videos Maps News Explore

8,374,082 REAULTS Date Language Region

Panda – Weknowpedia
https://en.weknowpedia.org/weknow/Panda

Panda, also called giant panda or panda bear is a bear native to south central china. It is easily recognized by the large, distinctive black patches around its eyes, over the ears, and across its round body. The name "giant panda" is sometimes used to distinguish it from the unrelated red panda. Thought it belongs to the order Carnivora, the panda's diet is mostly relied on bamboo. Panda in the wild will occasionally eat other grasses, wild tubers, or even meat in the form of birds, rodents or carrion. In captivity, they may receive honey, eggs, fish, yams…

Images of **panda**
bing.com/images

See more images of **panda**

Learn More

Panda Cutie is a cartoon movie and tells a story about a little panda named Cutie, who leaves the zoo and finally finds her home in China. Click the link to see the trail and learn more about Panda Cutie's adventure.

Related searches for **panda**

Panda's lifespan	★★★★★
Facts about pandas	★★★★★
Panda's favorite foods	★★★★★
Where to see live pandas	★★★★★
Panda Internet security 2016	★★★★★

5

Strawberry S Log in

Web Images Videos Maps News Explore

5,670,000 REAULTS Date Language Region

strawberry – Weknowpedia
https://en.weknowpedia.org/weknow/strawberry

The garden strawberry (or simply strawberry) is a widely grown hybrid species of the genus Fragaria. It is cultivated worldwide for its fruit. The fruit (which is not a botanical berry, but an aggregate accessory fruit) is widely appreciated for its characteristic aroma bright red colour, juicy texture, and sweetness. It is consumed in large quantities, either fresh or in such prepared foods as…

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cn.globalshopping.strawberrynet.co.tw
Want to buy your beloved beauty products from Asia, including Korea, Japan and Taiwan? Here we are! We will offer you the most popular products…

Korea Lip Balm
£2.99

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£3.99

Taiwan Lipstick
£4.99

Recommend search		Hot rate
1.	Apple	18763↓
2.	Orange	16432↑
3.	Strawberry	12945↑
4.	watermelon	9842↓
5.	Cherry	8763↓
6.	Grapefruit	7786↑
7.	Lemon	7699↑

Related searches for **strawberry**

How to grow strawberry	★★★★★
Strawberry cake	★★★★★
Strawberry dessert	★★★★★
Strawberry jam recipe	★★★★★
Strawberry cheesecake	★★★★★

6

MaiDi

Log in

Web Images Videos Maps News Explore

4,700,011 REAULTS Date Language Region

Maidi Official Store
Ad · Maidi.com
Latest Maidi Trainers & Gear. Or design your own. Free Returns! Free delivery with Maidi+. Returns are always free. | Shop the ...
maidi.com has been visited by 100K+ users in the past month
maidi.com is rated ★★★★★ (28,420 reviews)

Maidi – Official Site
http://www.maidi.com
We would like to show you a description here but the site won't allow us. So Just click on our site and find more amazing stuff in there!

Recommend search


Morning-running


Rope-skipping


Night-running

Maidi – Weknowpedia
https://en.weknowpedia.org/weknow/maidi

MaiDi

MaiDi, Inc. is an French multinational corporation that is engaged in the design, development, manufacturing and worldwide marketing and sales of footwear, apparel, equipment's, accessories and services. The company is headquartered near Paris, New York, London and Portland metropolitan area. It is one of the world...

Related searches for **Maidi**

- Maidi Outlet Store ★★★★★
- Maidi Clearance UK ★★★★★
- Maidi Sale Outlet UK ★★★★★
- Maidi Running trainers ★★★★★
- Maidi Free Run Series ★★★★★
- Maidi Factory Outlet Online ★★★★★

7

Shoes

Log in

Web Images Videos Maps News Explore

5,324,014 REAULTS Date Language Region

How to repair your favourite shoes – YohaaKnows
www.yohaaknows.com/beauty&style/fashion&style

You don't need to discard your favourite pair of shoes just because they're in disrepair. Save some money by troubleshooting common footwear problems rather than purchasing a new pair. Problem # 1- Stretched fit. A stretched fit can turn into an annoying problem when gaps allow your foot to slip around in the shoe, leading to blisters and general frustration...

Shoes – News

Eddy, Thai Elephant Wounded by Land Mine, Gets New Prosthetic Leg

Asia Life Times 19 Oct 2016
Eddy stepped on a land mine near Thai's border when he was 8 months old. He lost one of his front leg in this accident. This was happened a decade ago. While recently, he received his artificial limb, which thanks to the Asian Elephant Foundation hospital in Central Thailand. Eddy is one of more than a dozen elephants who have been wounded by land mines ...

Ad

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Ad www.designforyou.co.uk
Design your personal shoes, bags and even clothes! You have multiple choices on styles, clothing and deigns! We provide you the best you can be!

Join the Shoemaker and become rich!...
Ad www.shoemaker.com
One of the most popular stores in the world, and we are welcome you to join us and share our fortune!

Related searches for **Shoes**

- How to choose shoes with clothes ★★★★★
- Different style shoes for women ★★★★★
- Cheap shoes online ★★★★★
- Cushion walk shoes ★★★★★
- Online cheap shoes UK ★★★★★

8

Cake

Log in

Web Images Videos Maps News Explore

6,203,090 REAULTS Date Language Region

Cake – Weknowpedia
https://en.weknowpedia.org/weknow/cake

Cake is a form of sweet dessert that is typically baked. In its oldest forms, cakes were modifications of breads but now cover a wide range of preparations that can be simple or elaborate and share features with other desserts such as Pastries, meringues custards and pies. Typical cake ingredients are flour, sugar, eggs, butter or oil a liquid, and leavening agents, such as baking soda ...

History - Varieties - Special-design cakes - Shapes

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Egg Flour Milk

Yohaa - Food – Cake recipes
www. Yohaa.co.uk/food/**cake**

Browse our easy cake recipes: from birthday cakes, chocolate cakes and lemon drizzle cakes to the perfect Victoria sponge - not forgetting plenty of gluten-free options.

Sponge Cake Chocolate Cake Cupcakes Lemon Cake Fairy Cakes

Cakes at Your Local New-world Supermarket
www. Yohaa.co.uk/food/**cake**

Shop New-world Supermarket Delicious Food Range Now. Order Online & Collect in Your Local Store.

Related searches for **Cake**

- Cakes online UK delivery ★★★★★
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9

Pillow

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Pillow – News

Attention! Buy a cheap mattress, have a late night and bin your pillow: things you know about sleep is totally wrong
Daily Life 18 Oct 2016

...If you must have a pillow, use a single shallow one, which, on the right mattress, will compress to fit. It's better to regularly ...

This odd-shape pillow is perfect for your airplane naps
Yohaa Technology 18 Oct 2016

Why falling asleep in hotel is more difficult than in your ow bed?
Travel skills 17 Oct 2016

Pillow – Weknowpedia
https://en.weknowpedia.org/weknow/pillow

A pillow is used to sleep on and support the head/neck or other parts of the body while sleeping, lying down or sitting. In addition, pillows have decorative uses and are used on beds, couches or chairs; these are also referred to as cushions. In contemporary western culture pillows consist of a plain or patterned fabric envelope (pillowcase) which contains a soft stuffing, such as feathers ...

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Ad WonderSleep.com/Pillow
Up TO 60% Off The High Street Price Extra £10 Off Over £50 Code SAVE10. Pillow; Duvet; Waterproof...

Pillow – The Best Pillow
Ad www.beddings.com/Pillow
Shop No and Try It For 100 Nights. Learn How Great Our Pillows Are!

Pillows at New-world.co.uk – Low Prices On Pillows
Ad Newworld.co.uk/Pillows
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Ad related to paintbrush

Shop the best paintbrush in here!
www.bargain.co.uk/paintbrush Ad
Brand: Pro-Purdy Wooster Capri John's choice Ladders
type: Reach brush Flat brush Round tip brush Miniature brush


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Capri professional paintbrush...
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Paintbrush beginner's set ...
£15

Paintbrush – Image Results



More Paintbrush images

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Paintbrush selection	★★★★★
Paintbrush for beginners	★★★★★
Best paintbrush brand	★★★★★
Paintbrush training	★★★★★

Hottest search about paintbrush More

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2. Flat brush ↓
3. Smooth glide brush ↑
4. Long handled brush ↓
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6. Round tip brush ↑

11

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Bear – Image Results



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Cuddle bear toy	★★★★★
Bear types	★★★★★
Bear's living style	★★★★★

beloved bear toy– shopping at ToyOcean!
www.toyocean.co.uk/bear Ad


Stone's Toy the cuddle bear toy.....
£10.99


Cuttie's microwaved bed bear toy...
£15.99


John Swiss's cuddle bed bear toy ...
£12.99

Bear
Mamals
Bears are classified as caniforms, or doglike carnivorans, with the pinnipeds being their closet living relatives. Although only eight species of bears are extant, they are widespread, appearing in a wide variety of habitats throughout the Northern Hemisphere and partially in the Southern Hemisphere. Bears are found ...More

12

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Badminton - News

Badminton Coaches hope youngsters will blaze a trail to Olympic glory中
Champion's Nest 18 Oct 06:45

Dan Lin's movie is in the making
Asia Sports 18 Oct 07:30

Badminton ace Dan Miller claimed gold at European Senior Camps
Daily Sports 14 Oct 08: 18

Badminton - Weknowpedia

en.wekowpedia.org/badminton

Badminton is a racquet sport played using racquet to hit a shuttlecock across a net. Although it may be played with larger teams, the most common forms of the game are "singles" (with one player per side) and "doubles" (with two players per side). Badminton is often played as a casual outdoor activity .....

www.yeyuymq.game.com Ad
The Greater London Local Organising Committee proudly present the following badminton competition! Click the link and learn more.

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2. Basketball
3. Volleyball
4. Table Tennis
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6. Baseball

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Earth - Weknowpedia

en.wekowpedia.org/earth

Earth, (Otherwise known as the world) is the third planet from the Sun, the densest planet in the Solar System, the largest of the Solar System's four terrestrial planets, and the only astronomical object known to harbor life.
According to resources, Earth formed about 4.54 billion years ago...

Earth - News

Breaking news! E.T.'s Home Star Probably Looks Nothing Like the Sun
Morning Space 18 Oct 12:34
According to the latest findings, there is a potentially earth-like planet around the closet star to earth – that is the space headline that captured the world's imagination this summer...

Lonely Planets: Alien 'Hot Earths' Have Few Friends
Daily news from Star 18 Oct 10:53

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Soap - Weknowpedia
en.wekowpedia.org/soap

In chemistry, the soap is a salt of a fatty acid. Household mainly use soaps for washing, bathing and other types of housekeeping, where soaps act as surfactants, emulsifying oils to enable them to be carried away from water. In industry, they are also used in textile spinning, and re important components of some lubricants. Soaps for cleaning obtained by treating vegetable or animal oils and fats with a strong base...

Soap - News

Ten Ways to Keep Your Skin Calm And Clear
Life Time 23 minutes ago
Living with sensitive skin is difficult. It's not only painful but since it's the most visible part of our bodies, it can also be very emotional and stressful. Finding the right balance for your skin can be a life long journey. Before investing in treatment, here's everything you need to know about sensitive skin...

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Bathing


Head-washing


Face-washing

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Get Discounts on Football from the Top Brands. Click our link and buy online!

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Look through our huge selection of football kits we will give you the best price!

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Football - News

Football Clubs 'Justified in Studying Atlantic League
Europe Sports 23 Oct 20:42
Football match remembers Tony Jamie in fitting style
Weknow Sports 23 Oct 14:39
Football: Why doesn't Armstrong start have scholarship?
Sports Online Forum 22 Oct 15:12
体A former football player saved his dad with CPR
City's Star for Today 21 Oct 11: 32

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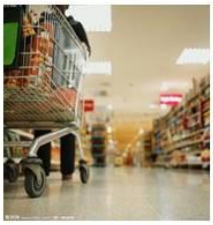
Shopping - Weknowpedia

en.wekowpedia.org/shopping

A retailer or a shop is a business that presents a selection of goods and offers to trade or sell them to customers for money or other goods. Shopping is an activity in which a customer browses the available goods or services presented by one or more retailers with the intent to purchase a suitable selection of them...

Shopping - News



Weknow Daily 20 Oct 11:48
In honour of the approaching holiday season — and the massive amount of shopping you're likely about to do — we've rounded up some of the best shopping apps for iOS and Android.....

Online Shopping at New World Supermarket | NWS.co.uk Ad
www.NWS.co.uk
Huge Range and great Savings at New World Supermarket Order Now. Delivery When You Want!

Shopping – Fashion Day – New Range Ad
Fashionday.co.uk/new-range
Purse Friendly Fashion Trends, Shop Online /Store to get 20% off 1st Order!

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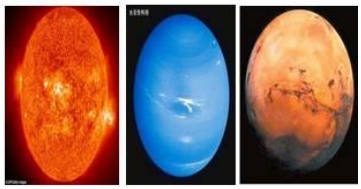

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Tiger - WeKnowpedia

weknowpedia.com/view/19372.htm

The tiger is known as the largest cat species, most recognizable for their pattern of dark vertical stripes on reddish-orange fur with a lighter underside. According to the report, the largest wild tiger had a body length of 3.35 m over curves and 388.2 kg in weight. As apex predators, tigers generally preying on ungulates such as deer and bovids. Tigers are territorial and usually solitary but social, they often requiring large contiguous areas as habitat that can support their prey needs .....

Warm home Direction

Pet shop

Address: 32 Victoria Street, East London, UK

phone: 0114 204 4848

Reviews:

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Tiger (Animal)

Cat species

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Great groupon for Fairgrounds! Best Christmas ever!
http://www.groupon.com/Fairgrounds/.....



Fairground in Paris... ~~£120~~ £100

Fairground in Barcelona... ~~£150~~ £ 110

Fairground in Rome... ~~£140~~ £ 118

In the News

"Scientific Fairground" will bring the best Christmas gift for children in London

Daily talk – 12 hours ago

To encourage children to love science, multiple city council organize their local scientific fairground to appeal children and make their Christmas with more fun. According to the latest report.....

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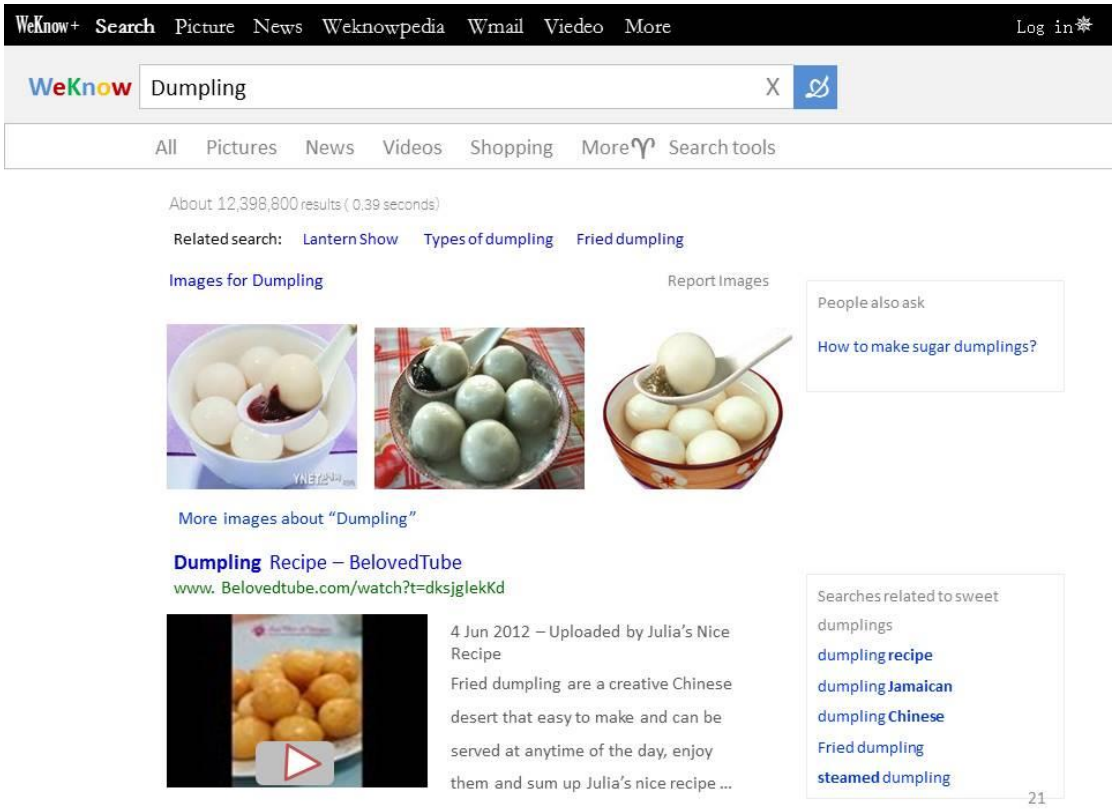
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Fried dumpling are a creative Chinese desert that easy to make and can be served at anytime of the day, enjoy them and sum up Julia's nice recipe ...
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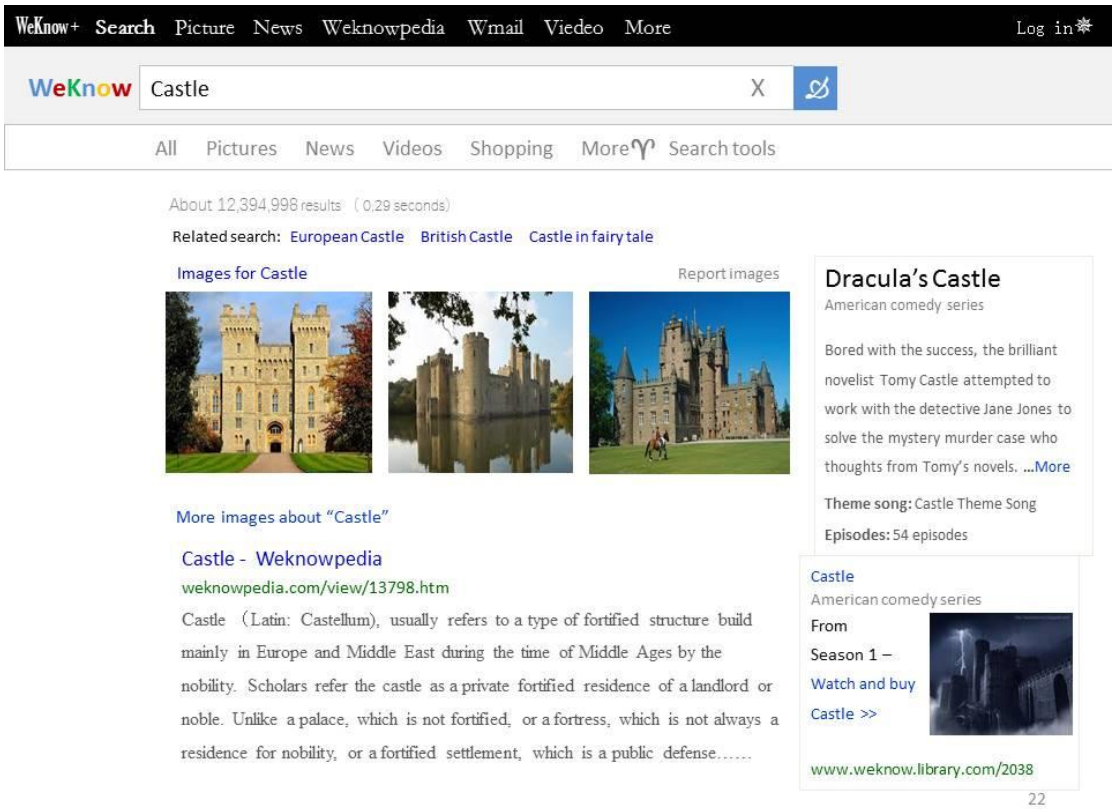
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American comedy series
Bored with the success, the brilliant novelist Tomy Castle attempted to work with the detective Jane Jones to solve the mystery murder case who thoughts from Tomy's novels. ...More
Theme song: Castle Theme Song
Episodes: 54 episodes
More images about "Castle"
Castle - Weknowpedia
weknowpedia.com/view/13798.htm
Castle (Latin: Castellum), usually refers to a type of fortified structure build mainly in Europe and Middle East during the time of Middle Ages by the nobility. Scholars refer the castle as a private fortified residence of a landlord or noble. Unlike a palace, which is not fortified, or a fortress, which is not always a residence for nobility, or a fortified settlement, which is a public defense.....
Castle
American comedy series
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SAA Travel | Worldwide Adventure Tour, Flights and Hotel
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Upcoming holiday:

Halloween
31.10.2016

In the news

The forgotten small beautiful Macquarie island make travelers shock

Tourist Online– 8 Aug 2015
A butterfly-shaped little island in the Dodecanese has gain great attention since a group of researchers have visited there. They reported amazing views and creatures living in this little island have survived from the undersea earthquake....

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The south Africa Lion King becomes six little lions' father

Animal World Breakthrough – 9 hours ago
Recently, the lion king named Comet in the Cap Town of South Africa became a father again for three little lions. According to the breeder of Comet, he has been a father for six little lions in total.....

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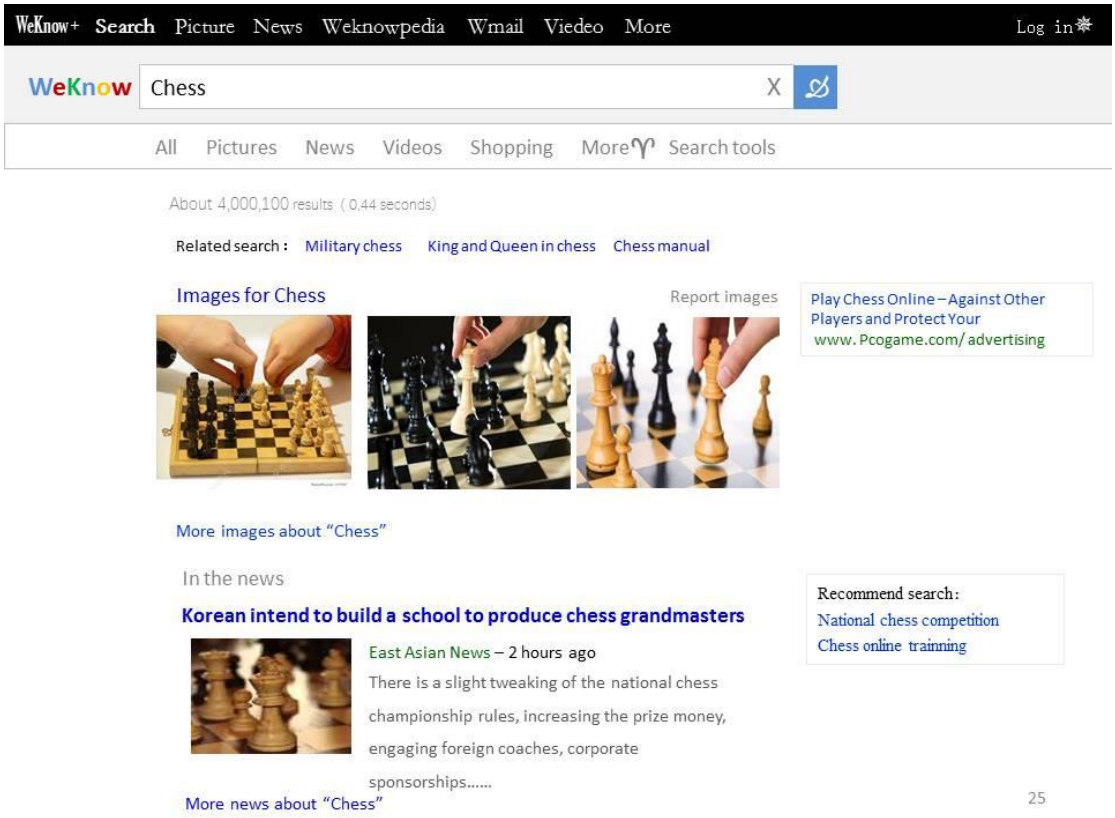
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Korean intend to build a school to produce chess grandmasters
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There is a slight tweaking of the national chess championship rules, increasing the prize money, engaging foreign coaches, corporate sponsorships.....
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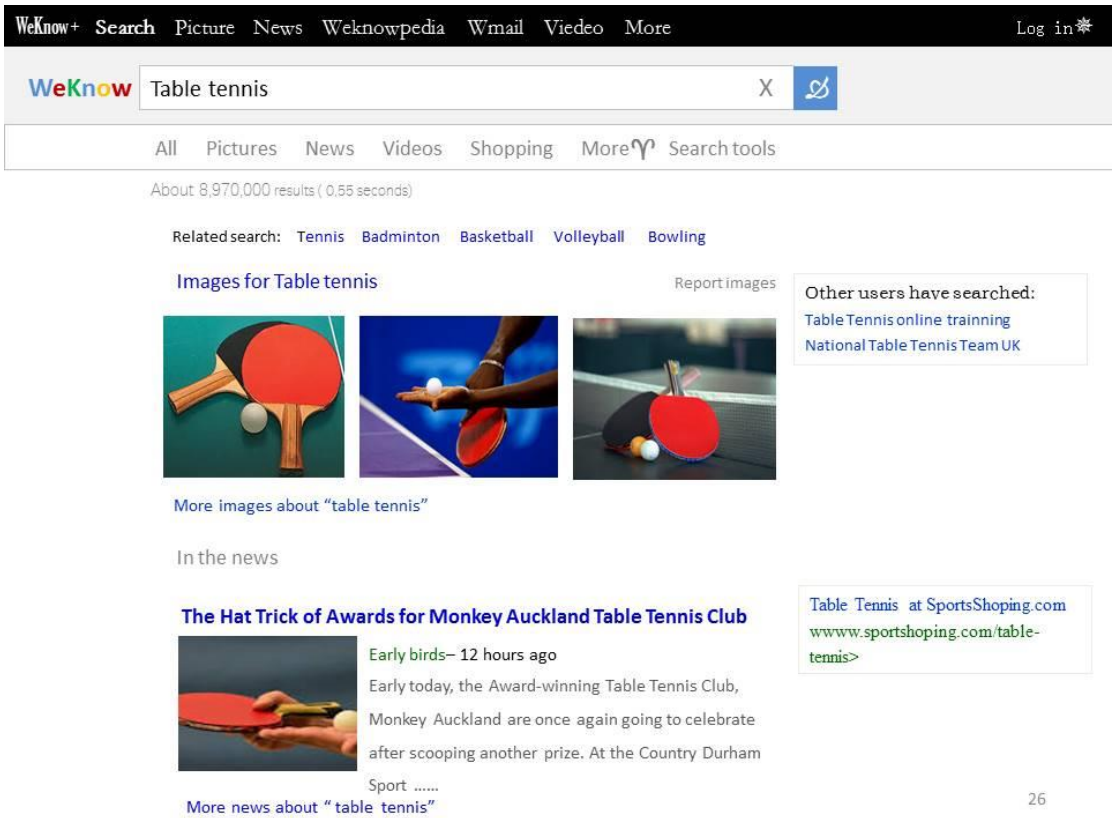
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Play Best Fox Games
www.51games.com/fox-games.html

Fox Revenge is a great action game. You have three lives. Your mission is to destroy all enemies on the screen as quick as possible. If you have not kill all of them in three minutes ,you will lose one life. It is worth nothing that you can... More>>

S.O.S, you are greatly needed at the pet store. You know! That's right, there are some poor little fluffy foxes there who are depending on you for getting fed...More>>

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Fox
https://en.weknowpedia.org/weknow/fox

Foxes are small-to-medium-sized, omnivorous mammals belonging to several genera of the family Canidae. Foxes are slightly smaller than a medium-size domestic dog, with a flattened skull, upright triangular ears, a pointed, slightly upturned snout, and a long bushy tail...

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Arctic Fox

Yellow Weasel

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Getting Rid of Foxes	3
Fox Species	2
Fox colours	1

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Question

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Images for Cat

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Celebration The National Black Cat Day 2016: 15 adorable black cats and kittens
Daily Information – 18 Oct 2016

There is a lot of silly superstitions around black cats, causing they're less adopted than other colour kitties. The National Black Cat Day happens every October 27 and fans are encourage to celebrate the beauty and uniqueness of black cats...

Adorable flying kittens get caught in messy cat fight as they ...
Yohaa News - 17 Oct 2016

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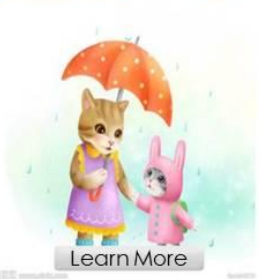

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2. Cat	★★★★☆
3. Monkey	★★★★☆
4. Lion	★★★☆☆

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Tea | Search | Answers | Videos

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Tea
https://en.weknowpedia.org/weknow/tea

Tea is an aromatic beverage commonly prepared by pouring hot or boiling water over cured leaves of the *Camellia sinensis*, an ever green shrub native to Asia. After water, it is the most widely consumed drink in the world...

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www.teafarm.co.uk/

Chinese Black Tea Gift Set
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★★★★★ rating for teafarm.co.uk

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4. Oolong teas	★★★★★
5. Fruit Teas	★★★★★
6. Chai Teas	★★★★★

29

Question

Fog | Search | Answers | Videos

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Fog is a visible mass consisting of cloud water droplets or ice crystals suspended in the air at or near the Earth's surface. Fog can be considered a type of low-lying cloud and is heavily influenced by nearby bodies of water, topography, and wind conditions. In turn, fog has affected many human activities, such as shipping, travel, and warfare...

Fog set to blanket Somerset on 27 October 2016
Daily Life in UK – 27 Oct 2016
The Met Office has issued a weather warning of **fog** across Somerset this morning as the sun comes up. Patches of **fog** are likely to form readily ..

Fog warning to drivers as 'tricky travelling conditions' hit
Yohaa News – 24 Oct 2016

Met Office issues new servere fog warning for York
Yorkshire Local News – 23 Oct 2016

Fog or mist expected during this weekend
North Yorkshire Observers – 22 Oct 2016

More news about "Fog"

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Whether Special Glasses could Protect People From Beijing's Hazardous Air

Asian Today – 18 Dec 2015
Last week, the Chinese government declared Beijing's first ever Red Alert for smog and pollution. "*Smog, smog, go away, little children want to breathe*, I think as I trudge to work, trying not to inhale too deeply. My breath bounces off my pollution mask into my glasses..."

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Postcard from Bern: Swimming along the rive Aare

Europe Daily - 25 Oct 2016

..."Swimming in the Aare is a deeply rooted culture within our city ... Locals are really nuts about it," says Kaspar Allenbach, the Bernese graphic designer behind the playful design of the Aare Guru app, which provides up-to-the-minute data on the river's water temperature and flow rate....

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www.equipmentsale.com/sports
The Online Most Popular Swim Equipment Shop! Price Match Guarantee · Fast Delivery · Easy Return

Swimming Home | One-stop UK...
www.swimminghome.co.uk
Here tells you everything you need to know about swimming, diving, synchro and water polo. All you need in one place.

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Train
https://en.weknowpedia.org/weknow/train
Train is a form of rail transport consisting of a series of vehicles that usually runs along a rail track to transport cargo or passengers. Motive power is provided by a separate locomotive or individual motors in self-propelled multiple units. Although historically steam propulsion dominated, the most common modern forms are diesel and electric locomotives, the latter supplied by overhead wires or additional rails. Other energy sources include horses

A person was hit by train on York to London Line

Local Yorkshire - 21 Oct 2016

According to the latest report, train service on the East Midland has been severely disrupted following an accident this morning. The line, from York to London, was closed for a while after a person was hit by a train...

Train operator stop train on busy platform and goes home...

Daily Talk - 20 Oct 2016

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