

CHARLES UNIVERSITY

FACULTY OF SOCIAL SCIENCES

Institute of Communication Studies and Journalism

Department of Marketing Communication and Public Relations

Bachelor's Thesis

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**Using New Technologies in Healthy Lifestyle
Interventions Targeted at Children: The Case of the
Netherlands**

Bachelor's Thesis

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Year of the defence: 2018

Declaration

1. I hereby declare that I have compiled this thesis using the listed literature and resources only.
2. I hereby declare that my thesis has not been used to gain any other academic title.
3. I fully agree to my work being used for study and scientific purposes.

In Prague on May 10, 2018

Marek Háša

References

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Abstract

New technologies such as social media or mobile games are often listed among the main contributors to the ever-increasing obesity rates among children. Paradoxically, the same technologies also bring potential to enhance the effectivity of healthy lifestyle interventions targeted at children.

This thesis investigated the approach of the creators of such interventions towards the use of new technologies. The author devoted his attention to downstream social marketing interventions realised in the Netherlands because of the country's low youth obesity rates and exceptional position in the latest innovation rankings. The central objective of this instrumental multiple case study research was to reveal the benefits and limitations of the researched practice as perceived by the interventions' creators.

Studying available documents and conducting four semi-structured interviews with the creators enabled the author to reconstruct the contexts and strategies of four Dutch healthy lifestyle interventions promoting exercise and healthy sleep and nutrition among children. The results indicated that the creators indeed regarded new technologies as a threat to children's physical and mental well-being; nevertheless, they also accepted them as an inevitable part of today's media environment and aimed to capitalise on their potential for healthy lifestyle interventions. Furthermore, the creators jointly called for further research evidence on the effectiveness of particular new technologies for different audience segments.

Abstrakt

Nové technologie, jako jsou sociální sítě nebo mobilní hry, jsou často viněny z přispívání k neustále rostoucímu procentu obézních dětí. Ty samé technologie však paradoxně skrývají velký potenciál pro kampaně propagující zdravý životní styl mezi dětmi.

Předmětem této práce byl přístup tvůrců takových kampaní k využití nových technologií. Autor se zaměřil na kampaně sociálního marketingu, které mají za cíl měnit návyky jednotlivců. Nizozemsko bylo pro svou nízkou prevalenci dětské obezity, a naopak velmi vysoké postavení ve světovém žebříčku inovativnosti vybráno jako země, jejíž kampaně by mohly poskytnout cennou inspiraci pro sociální marketéry z Česka i jiných evropských zemí. Hlavním cílem této mnohonásobné instrumentální případové

studie bylo odhalit, jaké výhody a limitace využití nových technologií spatřovali sami tvůrci kampaní na podporu zdravého životního stylu u dětí.

Na základě prostudování dostupných dokumentů a realizace polostrukturovaných rozhovorů s tvůrci sestavil autor případové studie čtyř nizozemských kampaní propagujících cvičení a zdravý spánek a stravu mezi dětmi. Výsledky výzkumu ukázaly, že autoři těchto kampaní skutečně vnímali nové technologie jako hrozbu pro fyzické i psychické zdraví dětí. Zároveň však tyto technologie považovali za neodlučitelnou součást dnešní mediální krajiny a chtěli využít jejich potenciálu pro své kampaně. Všichni konfrontovaní tvůrci navíc shodně volali po dalším výzkumu, který by odhalil, jaké nové technologie jsou skutečně efektivní pro různé cílové skupiny.

Keywords

social marketing, healthy lifestyle, children, new technologies, mobile games, social media, public health, the Netherlands

Klíčová slova

sociální marketing, zdravý životní styl, děti, nové technologie, mobilní hry, sociální sítě, veřejné zdraví, Nizozemsko

Title

Using New Technologies in Healthy Lifestyle Interventions Targeted at Children: The Case of the Netherlands

Název práce

Využití nových technologií v nizozemských kampaních na podporu zdravého životního stylu mezi dětmi

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Introduction

With its rates continually increasing in both adults and children, obesity is one of the leading preventable causes of death worldwide (World Health Organization [WHO], 2017b). Both American Heart Association (2016) and WHO (www.who.int) regard obesity as one of the most severe threats to public health in the 21st century. By creating healthier environments and dietary options, overweight and obesity can be largely prevented (www.who.int), especially in children and adolescents, among whom the prevalence of obesity has risen alarmingly from 4% to more than 18% in the last five decades (WHO, 2017b).

Social marketing, which proves to be a highly useful set of tools for the designers of such positive social change, has considerably evolved with the rise of new technologies, such as smartphones, mobile apps and social media (Evans, 2016). Innovative digital platforms have created new opportunities in the field of healthy lifestyle promotion, where they can be particularly effective if targeted at children and youth, the digital natives¹. However, the same new technologies also face serious criticism from public health experts for their contribution to an overly digitalised environment in which healthy food choices and plenty of movement are not a standard anymore (WHO, 2017a). According to Zlatko Marinov, Chief Physician at the Department of Obesity at Motol Hospital in Prague, Czech Republic, “new technologies are among the main causes of the current obesity epidemic - they are part of the toxic obesogenic environment we live in” (DVTV, 2017). The paradox of using innovative technologies in solutions to a problem which they themselves possibly contribute to at the same time will be the overarching theme of this paper.

The central research issue of this thesis revolves around the use of new technologies such as smartphones, mobile apps, tracking gadgets and social media in healthy lifestyle interventions targeted at children with a clear focus on the intervention designers’ perspective: What is the creators’ approach towards the use of new technologies in their interventions? The following questions may depict a more specific image of the thesis’ issues of interest: What reasons led them to the use of new technologies? What benefits and limitations of the use of mobile apps and social media

¹ In his eponymous article, Marc Prensky (2001, p. 1) popularized the term *digital natives* as a denomination of people who are “native speakers of the digital language of computers, video games and the Internet”. This label could be even more suitable for today’s children and youth, who are growing up in an environment saturated with even more advanced technologies.

in health promotion efforts do they identify? And what should be the role of new technologies in future healthy lifestyle interventions?

Providing an exploratory insight into the practice of creating innovative healthy lifestyle promotion among children is the primary objective of this thesis. The initial research design was comparative; the author intended to examine the approach of Czech social marketing practitioners in contrast to the approach of their Dutch colleagues. In the 2010 HBSC worldwide study on health behaviour in school-aged children (Curie et al., 2010), the Netherlands showed the lowest self-reported overweight or obesity rates among all EU countries in all of the 11, 13 and 15 years-old categories. For instance, only 8% of Dutch 13-year-olds were overweight or obese, while the world average was 14% and 13.5% Czech children of the same age reported a problematic weight. Moreover, the Netherlands were pronounced the third most innovative country in the world by the latest Global Innovation Index (Cornell University, INSEAD & WIPO, 2017), and OECD (2017) listed the Dutch Nutrition Center as a quintessential example of implementing innovative public health campaigns with the use of online technologies. These facts provided support to the assumption that studying Dutch cases would generate valuable insights for Czech designers of social marketing campaigns in terms of effective innovation.

Nevertheless, during the initial phase of the research, no well-suitable healthy lifestyle interventions were found in the Czech Republic. Tackling all the factors contributing to obesity requires a complex coordinated effort on multiple efforts (Duane, Domegan, McHugh & Devaney, 2016). As a communications scholar, the author aimed to investigate the downstream social marketing² part of this battle, that is the campaigns and interventions persuading individuals to adopt healthy lifestyle habits. Bacuvcik and Harantova's (2015) book on Czech social marketing campaigns demonstrates that there haven't been many healthy lifestyle campaigns created apart from policy interventions or CSR projects of different food brands. On the contrary, the work of Merritt, Kamin, Hussenöder and Huibregtsen (2017) suggests that social marketing is becoming a well-established domain in the Netherlands. There are many Dutch innovative pilot projects, as well as already implemented campaigns, that could have been of interest to this our

² Hoek and Jones (2011) distinguish two major social marketing approaches to social change: upstream, which strives for policy change and aims to create environments where social change is convenient for the target audience, and downstream, which focuses on inducing behaviour change on an individual level. These two approaches should ideally coordinate their actions in order to spark and sustain social change.

research, which can be documented by a number of recently published Dutch scholarly studies on this topic (Belmon, Middelweerd, Velde & Brug, 2015; Dute, Bemelmans & Breda, 2016; Kroes & Shahid, 2013; van Grieken, 2013). For this reason, the research then focused solely on Dutch social marketing projects targeting children, which are deemed to provide a more fruitful contribution to the problem studied.

Due to the international nature of this thesis, the author decided to apply APA Style, the most prevalent writing style within social sciences outside of the Czech Republic (www.bibme.org), to citations, references and the structure of this study; hence the key findings generated through a multiple case study research will be presented in the Discussion chapter alongside the limitations and implications of the research, while Conclusion will serve as a summarizing point of the thesis as a whole.

The first part of the thesis provides a theoretical discussion on the relationship between children, new technologies, and a healthy lifestyle. It provides a theoretical framework for the forthcoming qualitative research: social marketing is introduced as a field which can largely benefit public health; the contradictory arguments on children, new media, and healthy nutrition and exercise are discussed; latest examples of the use of new technologies in healthy lifestyle promotion are described to demonstrate its potential to the field. The second part then presents four qualitative case studies on Dutch healthy lifestyle interventions, which constitute the core of the thesis. These projects are innovatively promoting drinking water, exercising, adopting essential healthy nutrition and movement habits, and pursuing quality sleep respectively. By studying only campaigns which indeed use new technologies and capitalising on the wide variety of healthy habits they are promoting, the author strives to provide new scholarly insights into the practice of using new technologies in healthy lifestyle interventions targeted at children.

1. Literature review

The purpose of the following literature review offering the theoretical framework to this research is threefold: First, it introduces the field of social marketing in the context of public health and presents key principles to which social marketing interventions ought to adhere in order to induce social change. Second, it depicts contradictory perspectives on the relationship of children and new media with regard to health and a healthy lifestyle. Third, it offers a review of the benefits and limitations of using new technologies identified by previous healthy lifestyle interventions and pilot studies.

1.1 Social Marketing and Health

The fundamental principles and planning process of healthy lifestyle interventions presented in this chapter will facilitate our understanding of the role of new technologies in the analysed cases. Nevertheless, before looking into the planning process of health promotion campaigns, it behoves the author to briefly introduce social marketing in the contexts of public health and Europe.

1.1.1 Social Marketing in Europe

Perloff (2017) regards social marketing as one of the possible approaches that can be adopted by communication campaigns which strive to address specific social issues. Merritt et al. (2017) use the “one of the perspectives” label as well, only this time in the context of the behaviour change discipline. What makes the social marketing approach different from its competition is the implementation of commercial marketing concepts and techniques in the process of social change (Lee & Kotler, 2011). When applied in the context of public health, social marketing adapts and utilises well-established marketing tools and strategies to increase the prevalence of healthy behaviours in a population (Evans & McCormack, 2008). However, Wymer (2015) highlights the need for interdependency of social marketing and public health: commercial marketing techniques are not self-sufficient in addressing non-communicable diseases³; without understanding and adopting public health concepts, social marketing interventions cannot succeed.

Marketing social change as the primary product of public health poses a particular challenge because of the unprecedentedly hostile environment towards stimulating the

³ WHO (www.who.int) distinguishes four main types of non-communicable diseases: cardiovascular diseases, diabetes, cancers, and chronic respiratory diseases. These are all non-contagious chronic diseases of long duration and slow progression.

demand for this product (Siegel & Doner, 2007). The interventions' fundamental assumption is that changing individual behaviour will lead to public good, which is naturally contrasting the ideas of libertarians, who claim that every person can and should make their own life choices (Perloff, 2017). The threat of manipulation accusations is perhaps the main reason why social marketing is yet to become a widely accepted and used field in Europe, along with the competition of behaviour economy's seemingly cost-effective solutions to social issues (Merritt et al., 2017), the lack of sufficient evidence, and the disruptive counter-efforts of political and industry-based special-interest groups, which often strive to prevent social change (Ibrahim, 2015; Siegel & Doner, 2007).

Duane et al. (2016) point out the complexity of social marketing interventions, which were traditionally devoting all of their attention to changing individual behaviour with the help of commercial marketing concepts, but now need to build on these efforts in the second stage of social marketing by adjusting the whole web of intertwined influences which shape the issue tackled. Addressing comprehensive threats to public health requires a coordinated effort on multiple levels, in which stakeholders from various spheres including the government all act together (Duane et al., 2016; Wymer, 2015). A similar idea is presented by Siegel and Doner (2007, p. 20), according to whom, three major elements of social change need to be fulfilled in order to successfully tackle public health threats: "1) modifying individual behaviour and lifestyle, 2) improving social and economic conditions, and 3) reforming social policies". This thesis devotes its attention to the first element – dissolving social norms and inducing a lifestyle change with downstream social marketing (Kenny & Hastings, 2012).

1.1.2 Designing Health Interventions

The fundamental principle of social marketing lies within the orientation towards customer (in this case, a member of the target audience), a concept derived from modern commercial marketing theory (Lee & Kotler, 2011). According to Hall (2014, p. 77), the social marketing cycle-process starts with identifying a problem and continues with marketing research, segmentation, targeting, establishing objectives, developing a marketing strategy, implementing it, evaluating its efficacy and then redefining the problem again. Lee and Kotler (2011, p. 11) present a similar (yet more linear) model; however, they place the phase of researching into behaviour barriers, benefits, and competition just after selecting the target audience and articulating objectives. In any case, designers of a public health intervention must first thoroughly investigate the

contexts and motives of the undesirable behaviour; only then can they formulate persuasive messages which will motivate the target audience to adopt the desired habits and lifestyle (Wymer, 2015). Additionally, due to the oversaturation of health-related information in the media landscape, interventions' designers should tailor both their audience segmentation and communication strategy to the desired behaviour change and the lifestyles, preferences, beliefs and habits of the targeted individuals (Evans & McCormack, 2008).

The ultimate goal of downstream social marketing is to communicate the new behaviour as an offer which seems accessible at low economic or social costs, and more attractive than competing behaviours (Hall, 2014). Weinreich (2011) denominates this as product positioning: Social marketers highlight the benefits of the product (desired behaviour) in contrast to the competition (other behaviours or nonadaptation to the desired behaviour) and strive to translate these benefits into the minds of the target audience. Both social marketing theory and practice seem to have difficulties with consistently translating the classic marketing concept of 4Ps into the social change context (Peattie & Peattie, 2012). However, product generally stands for the promoted behaviour or social change (Lee & Kotler, 2011; Peattie & Peattie, 2012; Weinreich, 2011). Price represents the social, emotional or economic costs of abandoning the unhealthy habits or adopting the desired behaviour (Weinreich, 2011). Place involves both context-relevant placing and timing of the audience's encounter with the desired behaviour (Weinreich, 2011), as well as ensuring easy accessibility of the product to all segments of our target audience regardless of their socio-economic background (Peattie & Peattie, 2012). Finally, promotion refers to articulating effective persuasive health messages and deciding when, where, and how to convey them (Peattie & Peattie, 2012); this P is again very similar to the original marketing concept and includes designing and implementing a marketing communication mix (Hall, 2014).

The forthcoming case study research investigates the role of new technologies and their position within the 4Ps of social marketing for each of the analysed interventions. Nevertheless, it must be noted that in practice, designers of public health campaigns often do not, in fact, possess strong marketing skills (Siegel & Doner, 2007), and their social marketing interventions are instead based on their assumptions, intuition, and experience (Hall, 2014). Thus, another point of interest is whether or not social marketing concepts and schemes are utilised in the interventions studied in this thesis. In the next chapter, the

author proceeds to introduce the debate on the role of new technologies in children's life and health, which will also be reflected in the case study research.

1.2 Children, New Technologies, and Healthy Lifestyle

Initially, this thesis aimed to examine interventions targeted at youth. However, the United Nations flexibly define this category with the age of 15-24 (www.unesco.org), which is not in correspondence with the target audience of the cases studied. Therefore, also in this theoretical framework, the focus is narrowed to children, an age group with the upper boundary of roughly 15 years old. This chapter serves as an introduction to the contradictory arguments within the debate on new media's effects on children's development and both physical and psychological well-being. After a brief overview of the general perspectives, the chapter's attention is devoted particularly to the relationship of children's use of digital technologies and the (un)healthiness of their lifestyle. Terms such as digital or new technologies must be regarded with their relativity in mind, because they can be interpreted in many different ways, each time grouping different types of media content and platforms. For the purpose of this thesis, new technologies can be defined as a combination of modern hardware technologies such as computers, smartphones, iPods, or video game and interactive television platforms, and digital media and services, such as social networks, online messaging services, or mobile apps (Subrahmanyam & Smahel, 2011). The use of smartphones, for instance, is widely spread in the Netherlands, with more than 95% of Dutch teenagers using one (www.statista.com), and around 85% of Dutch secondary schools incorporating smartphones into lessons (Dutch News, 2015).

1.2.1 New Media's Influence on Children

As put forth by Valkenburg and Piotrowski (2017), the amount of time children spend with media today exceeds their time in school. Digital media are a fundamental part of the media consumption of today's children (Subrahmanyam & Greenfield, 2012), and they have established themselves so without necessarily reducing television time (Tarpley, 2012). Strasburger, Wilson and Jordan (2014) claim that children's capabilities to absorb and interpret media messages largely differ from the media perception of adults, but also from the media use and processing of adolescents, for whom peer acknowledgement, independence, and sexual development breed much greater importance. From what is often presented in the media themselves, the debate on new

media's influence on young people may seem to be inclining towards the downsides (Valkenburg & Piotrowski, 2017). However, as Singer and Singer (2012) argue, a substantial part of the criticism is based on assumptions and speculations rather than research evidence. Instead, research inclines in favour of neither the dystopian nor the utopian paradigm (Valkenburg & Piotrowski, 2017). Emerging technologies bring numerous benefits to the lives of children, while also posing many threats, which need to be examined in the context of recent social, political and economic changes (Buckingham, 2006). Introducing some of the different perspectives will be useful for the forthcoming research.

Subrahmanyam and Smahel (2011) deem the digital environment to be constituting a new social context for children and adolescents' development. On the one hand, digital technologies certainly bear many positive opportunities in this respect: the Internet empowers children to learn from infinite amounts of information which is accessible at all times and share the new ideas with their peers instantly; playing video games can improve many of children's cognitive skills (Subrahmanyam & Greenfield, 2012); social media provide children with tools and space important for their identity development and self-reflection (Zhao, Qiu & Xie, 2012), and create a comfortable environment for debates on sensitive topics (Subrahmanyam & Smahel, 2011); new technologies yield promising potential for developing new learning experiences more appropriate for the 21st century (Chee, 2015); by virtue of mobile apps, previously not very accessible activities such as photography are now extremely easy to use and can stimulate imagination and other abilities of children's minds at large scale (Gardner & Davis, 2014); mobile phones provide a rare sense of privacy to children in social contexts where private spaces are largely regulated (Ruddock, 2013); the combination of education and the entertainment elements of new media can facilitate conveying health or sexuality education messages to children (Valkenburg & Piotrowski, 2017). On the other hand, both physical and psychological well-being of children might be endangered by the (over)use of new technologies in numerous ways: the Internet exposes children to risky materials, sexually explicit or drastic violent content, and dangerous people (Buckingham & Willett, 2006); social networks create opportunities for cyber-bullying, and may contribute to lowering one's self-esteem (Zhao, Qiu & Xie, 2012), or negatively influence the development of children's intimacy and relationships with friends and family (Subrahmanyam & Smahel, 2011); uneven access to digital technologies due to children's different socio-economic backgrounds can further deepen social inequalities

(Subrahmanyam & Greenfield, 2012); digital platforms enable food and beverage producers to advertise their (unhealthy) products in ways and forms that are much more appealing to and effective with children (Institute of Medicine, 2006); violent content may fuel aggressive behaviours in certain children (Valkenburg & Piotrowski, 2017); the attractiveness of digital gadgets might result in children's addiction to them (Dutwin, 2010); extensive use of smartphones, computers and video game platforms can cause harm to children's physical health, such as damage to their sleeping patterns and unhealthy reduction in exercise and movement (Subrahmanyam & Smahel, 2011; Subrahmanyam & Greenfield, 2012; Valkenburg & Piotrowski, 2017)

This brief account of different arguments illustrates that the positive and negative effects often stem from the same attributes of new technologies. As put forth by Tarpley (Tarpley, 2012), we should regard new technologies as tools, whose impact depends largely on their usage and is yet to be fully comprehended in further research. Subrahmanyam and Greenfield (2012) agree that longitudinal research data are needed to decide which of the fears are rightful and which of the opportunities are indeed promising. Since the central point of our interest is preventing childhood obesity, the following chapter narrows the attention to the potential negative and positive effects of new technologies on children's physical condition.

1.2.2 New Media, Healthy Nutrition and Exercise

Sedentary activities and unhealthy food marketing are often linked with increases in childhood obesity rates by the media and public. Subrahmanyam and Greenfield (2012) suggest that a relationship might exist between time spent playing video games and obesity. Brockmyer (2014) also refers to video games' contribution to increases in sedentary lifestyle and obesity. However, research evidence for the connection between obesity and interactive technologies is sparse, with no direct causal effect proven (Subrahmanyam & Smahel, 2011). Dutwin (2010) confirms the need for more statistical evidence by discussing the mixed results of previous studies and suggesting that less media use does not necessarily lead to increased physical activity in children. Strasburger, Wilson and Jordan (2014) mention another type of threat to children's well-being: new technologies, if used extensively or until late hours, may depress the quality of sleep and shorten children's life cycles, thus conducing to overweight or obesity. Especially mobile phones are the deemed to be the cause of regularly delayed bedtimes for many children, which can lead to both physical and psychological difficulties in children's daily lives

(Subrahmanyam & Smahel, 2011). Additionally, according to Dutwin (2010), lengthy computer use often causes damage to children's posture due to unhealthy computer setup.

A different line of critique is concerned with media content rather than media (over)use. Valkenburg and Piotrowski (2017) argue that food advertising is a notable contributor to increasing obesity risks. Horgen, Harris and Brownell (2012) have a similar stance towards this issue and highlight the role of new technologies, which they regard as a tool food marketing now uses to deepen its integration in the lives of children and youth, which will only worsen the negative impact of unhealthy food marketing on obesity rates. According to the U.S. Institute of Medicine (2006), the food and beverage marketing industry strives to capitalise on online interactive technologies' vast potential for branding and advertising. Food brands are increasingly using tactics such as personalised online ads, advergames or product placement in videos and video games to create persuasive appeals which hold greater allure for children and youth (Institute of Medicine, 2006). Despite the numerous pledges of the food industry to reduce children's exposure to unhealthy food advertising, and to promote healthier alternatives as well, it appears that food brands are nowhere close to desisting from targeting the vulnerable audience of children with unhealthy habits-inducing messages (Institute of Medicine, 2006; Horgen, Harris and Brownell, 2012).

Contrariwise, some authors suggest that new technologies offer significant potential for effective social marketing interventions and health communication campaigns. The latest OECD (2017) report on obesity mentions the use of new technologies and social media among promising developments in communication policies tackling obesity. As Dutwin (2010) notes, the Internet enables public health professionals to communicate their prevention messages to children and youth cost-effectively if smart solutions are adopted. Zhao, Qiu and Xie (2012) focus on social networks and argue that new learning experience and interactivity features are the key opportunities which can be grasped by awareness campaigns targeting children. Valkenburg and Piotrowski (2017) highlight the importance of synthesising health education with entertainment, while also pointing to the link between exergames⁴ and better physical health of children. Participation and creativity are among the features that new media education projects can capitalise on (Lin, Chen & Chai, 2015). Chee (2015) adds that in order to truly exploit

⁴ As Brockmyer (2014) puts forth, exergames – digital games which track real physical movement of the player – were not initially designed to improve health; however, they yield potential for children's physical well-being and fitness.

contemporary technologies' potential in education, innovative teaching designs need to be created. Brockmyer (2014) confirms the potential of different types of digital games for improving children's physical condition, raising awareness, inducing social change, and even helping with serious or chronic medical conditions.

The review of Badawy et al. (2017) suggests that using mobile apps and text messaging in public health interventions increases their feasibility and acceptability. Similar conclusions can be found in the study by Glik et al. (2016), who claim that new media are very promising for health communication when it comes to attracting youth, nevertheless, they should not be the only strategy of health prevention efforts; instead, they should be integrated in multi-level interventions. Additionally, the study by De Cock et al. (2017) suggests that there indeed exists some evidence for the positive effect of commercial nutrition and fitness apps on the youth's eating habits and body mass index. However, as both the works by Dute et al. (2016) and Nollen et al. (2014) put forth, more research evidence is still needed to investigate the potential of mobile technologies for health promotion. Studies discussed in the following chapter will provide further testimony to the potential that mobile and other new technologies yield to healthy lifestyle promotion, while also depicting the limitations of digital intervention designs.

1.3 Promoting Healthy Lifestyle in the Digital Age

To bridge the previous parts of the theoretical framework, this chapter inspects new technologies with the lenses of healthy lifestyle-related social marketing efforts, provides further discussion of the opportunities and limitations of using new technologies in such interventions, explains the need for further research in this area, and concludes with the enunciation of hypotheses relevant to the forthcoming case studies. Studies introduced in the previous chapter indicate that the designers of health-related interventions and education projects can largely capitalise on the interactivity, engagement and entertainment elements of new technologies. Kubacki, Runhle-Thiele, Schuster, Wessels and Gruneklee (2015) also mention the interactivity of digital media and technologies among the key benefits and add anonymity, low cost, high reach and diverse segmentation opportunities available at reasonable expenses to the list. Weinreich (2011) devotes particular attention to social media and claims that they enable social marketing interventions to genuinely engage with a narrower audience segment by providing these people with more information and opportunities to interact with others. The study by Naslund et al. (2017) suggests that a connection might exist between

effective user engagement and improved results of health interventions which utilise social media. Balatsoukas, Kennedy, Buchan, Powell and Ainsworth (2015) focus more on the interaction between the members of target audience when arguing that different social media aspects such as community information sharing, peer pressure and social support may improve the efficiency of public health interventions. The recent study by Corepal et al. (2018) confirms that gamification and physical activity tracking can collectively create interventions which are accepted by the target audience as entertaining and enjoyable. Other ways of using new technologies such as SMS-based intervention designs (Fassnacht, Ali, Silva, Goncalves & Machado, 2015; Hingle, Nichter, Medeiros & Grace 2013) and healthy behaviours-promoting mobile apps (Flores Mateo, Granado-Font, Ferré-Grau & Montaña-Carreras, 2015; Kroes & Shadid, 2013) have also proven to offer intriguing potential in some studies.

New technologies have anchored an integral position in the media environment that children and youth live in (Subrahmanyam & Greenfield, 2012), and children's abilities to use new technologies are deemed to be continually improving from an early age (Dutwin, 2010). In this media context and taking into consideration all the aforementioned benefits and opportunities, using new technologies in public health interventions seems to be largely advantageous. According to Kubacki et al. (2015), social marketers are increasingly adopting the trends of commercial marketing, which also contributes to the rapid growth of using new technologies in the field of public health. Nevertheless, implementing new technologies is also accompanied by numerous concerns and limitations.

According to Mays, Weaver and Bernhardt (2012), several considerations need to be taken into account when designing digital interventions: Is the new technology accessible to the target audience? Is it a well-suited, cost-effective means of addressing this target group? Does it offer considerable benefits for conveying the message and engaging the audience? Can the intervention's impact be easily measured and evaluated? Evans (2016) supports the last of these concerns when arguing that due to the virtually nonstop access to such technologies, controlled studies are much more difficult, and the whole discipline of intervention design evaluation must adapt to the increasing use of digital technologies. Weinreich (2011) highlights the need for authenticity and relevance when implementing a social media-based intervention, while Dute et al. (2016) propose another concern regarding social network technologies – the effectivity of social features such as results sharing, challenges and comparison with others have not yet been

sufficiently supported with research evidence. Balatsoukas et al. (2015) question the ability of social media to function as the sole channel of health-promoting interventions. According to Schoeppe et al. (2017), healthy lifestyle-promoting commercial apps should implement more health behaviour theory in order to be truly beneficial for public health. Gabrielli et al. (2017) agree with the lack of theoretical background in commercial app-based interventions and note that non-commercial, evidence-based apps tend to be less engaging and popular among members of the target audience. Ernsting et al. (2017) propose a similar argument and claim that a considerable part of health-related apps is not engaging enough and that the extent of their engagement often coincides with their target audience's age, socio-economic status and other characteristics.

Finally, it must be noted that a number of authors express the need for further research on this topic. Zhao, Freeman and Li (2016) suggest improving the reporting of app-based health interventions and focusing on randomised controlled trials of large scale and high quality. White, Burns, Giglia and Scott (2016) agree and add that comprehensive evaluation plans should be implemented to measure the engagement strategies, behavioural outcomes, intervention mechanics and technological performance of the apps. A different approach is suggested by Belmon et al. (2015) who claim that further research should focus on identifying the most effective app-based behaviour change techniques for different audience segments and personality types. A similar idea is expressed by Corepal et al. (2018) who call for more longitudinal research investigating the effectiveness of specific gamification elements for different age groups and genders. Finally, Balatsoukas et al. (2015) propose investigating the extent to which theory influences the effectiveness of digital health interventions.

To conclude, there exists supportive evidence of the potential of new technologies for healthy lifestyle intervention design; however, this does not go without some concerns and limitations. Hypotheses that can be derived from the above-presented theoretical framework for the purpose of our research include the following: Using mobile apps, social media, activity tracking, digital gamification⁵ and other types of new technologies may be a feasible strategy to design a cost-effective intervention which is largely accepted by, appealing to, and engaging with children. The social features of social media and some health-related mobile apps can function as an effective motivational mechanism.

⁵ Gamification capitalises on people's inherent lust for competition and achievement. Incentives, levels, achievement "badges" and other types of game mechanics are used to enhance people's engagement in non-game environments and activities. (www.merriam-webster.com)

Opportunities to integrate interactive and entertaining elements in the intervention are among the benefits as well. However, social marketers should carefully consider if the use of new technologies is appropriate for the desired behaviour and target audience of the intervention. The interventions should be both evidence-based and engaging. Social marketers face difficulties when measuring and evaluating results of digital-based interventions, and further research evidence is still needed to confirm the positive aspects of the use of new technologies in health promotion. Additionally, as Buckingham (2015) suggests, a critical approach towards the use of new technologies in educational efforts is desirable. Substantial critique of new technologies can be found in the literature with regard to children and their development. Undeniably, social marketers should take into consideration the potential threats to children's well-being and seek the right balance when planning their desired new media use time.

The following multiple case study research will explore the perspectives on these issues held by the creators of Dutch healthy lifestyle interventions targeted at children, as well as study how these perspectives translate into their practice within the design and implementation of the actual interventions using new technologies.

2. Research Methodology and Results

The primary nature of this research is exploratory rather than verifying, thus it is the main aim to provide new insights into the practice of implementing new technologies in social marketing interventions promoting a healthy lifestyle among children. The purpose of these insights should then be to stimulate further research and specify its desirable directions. The contribution of this research lies within its focus on the approach of the interventions' creators.

The research questions are:

1. What were the intended functions of the particular new technologies in the analysed healthy lifestyle interventions targeted at children?
2. What benefits and limitations of the use of social media, mobile apps, gamification and exergames do the creators of the interventions identify?
3. What are the conditions which, according to the interviewed creators, need to be fulfilled to effectively implement different new technologies in healthy lifestyle interventions targeting children?

However, these questions serve only as guideposts to the author when discussing the results. The goal of this research is to fully comprehend the issue of interest and reveal the benefits and limitations of the investigated practice, which can be further explored and implemented in future research.

2.1 Research Methodology, Methods and Design

Instrumental case study research as described by Stake (2010) was chosen as the research of this thesis.

Case studies constitute a broad field of research which is abundant in different variations. Ridder (2017) distinguishes four significant lines of qualitative case study research design: The first two designs are built on positivist fundamentals. In the *No theory first* design, research questions often stem from gaps in theory. The researcher identifies cases which could provide insights into the investigated phenomenon and analyses them with pattern-matching logic without being limited by previous theory. Contrarily, the *Gaps and holes* design starts with a thorough analysis of previous theory. Pattern-matching logic is again the primary case analysis tool, and the research concludes with the process of analytic generalisation. Ridder's denomination of the next design - *Anomalies* - is rather self-explanatory. Here, the researcher seeks interesting,

extraordinary cases, which could presumably pose a testimony to the failure of theory. The observation of participants along with the understanding of social processes leads to the reconstruction of theory. Finally, the *Social construction of reality* design is based on the ideas of social constructivism⁶ and derives from the work of Stake (2010). This thesis identifies and describes the strategies of using new technologies implemented in the real-world cases; however, the main point of interest is the approach of the interventions' creators and their perception of the central research issue. From the philosophical perspective, the Social construction of reality design was thus identified as most suitable for the non-factual, interpretative nature of the aforementioned research focus.

According to Stake (2010), a case study is, first and foremost, a selection of the subject of interest. The first goal of a case study is to understand the case in its full complexity, and it is also the ultimate goal of intrinsic case studies, which are focused solely on the case of interest. The other type of case studies described by Stake (2010) is instrumental case studies, whose ultimate goal is to understand a specific phenomenon. Here, the role of cases is supportive - they provide real-world insights into the issue of interest. However, even when the central aim is to understand a specific phenomenon, each case study is an in-depth investigation into the one exemplar. The multiplicity of cases can positively contribute to the understanding of the research issue, in this research the approach of interventions' designers towards the use of new technologies in healthy lifestyle promotion among children. Stake (2010) suggests that depicting the occurrence of the phenomenon in the different situational contexts of several exemplars may enhance the trustworthiness of our interpretation of the research issue. Nevertheless, we must note that the findings of such studies are always subjective, albeit the multiplicity of cases studied.

Case study researchers must inevitably make selective decisions in terms of which documents, answers, findings and insights are of interest to the case and research issue. According to Stake (2010), the researcher should ideally function as an assistant in the reader's process of constructing knowledge about the case and research issue; the researcher's role should be twofold: to pronounce their interpretations; to provide the reader with materials enabling them to make their own assertions. For this reason, the

⁶ The central thought of Berger and Luckmann (1966), the fathers of social constructivism, is that reality is not created; instead, reality is being constructed through interactions with others. The implication of this sociological theory for our research is that the approaches of the interventions' creators are subjective and dependent on the creators' professional contexts.

author included full interview transcripts in the appendices as well as references to all information resources which were available online to the public.

The sub-chapters below offer a closer depiction of the research process and some details of the multiple case study design applied in this thesis.

Cases selection

The selection process is crucial especially with the instrumental multiple case study design (Stake, 2010). Stake (2010) suggests that purposive sampling needs to be applied in such design, and describes its phases as follows:

First, there is a population of all hypothetical cases. In this research, this population was all healthy lifestyle interventions targeting children, which had been recently implemented in the Netherlands and had used new technologies in some way. The author decided to focus solely on downstream social marketing interventions and eliminate all commercial CSR projects and school-based public policy interventions.

Second, accessible cases are identified to create a smaller sub-population. In this research, the subpopulation was identified gradually with the help of the members of Dutch Olympic Committee, who provided the author with contacts to numerous Dutch institutions and professionals interested in the area of health promotion among children. After many e-mail conversations and a few months-long initial researching with the help of a Dutch public health student, two potentially accessible interventions matching the profile of the cases of interest were found. The demandingness of this phase of the research was certainly one of the surprises the author experienced when preparing this thesis. Orientating oneself within the field Dutch public health and healthy lifestyle interventions would have undoubtedly been less difficult if the author had been a Dutch native speaker and inhabitant of the Netherlands.

Third, the researcher should create a selection of cases which offers a unique balance between variety (different authors, locations, behaviour change goals and communication strategies) and the opportunity to learn a lot about the research issue. Unfortunately, in this research, the author must have addressed both of the interventions identified in the previous step. After conducting the first two case studies and interviews, the author was given leads to two more potentially intriguing interventions by one of the interviewed creators, Ellis Koster. This recommendation element can be regarded as a violation of the ideal purposive sampling process and one of the limitations of this research. However, it must be noted that the outcome – the final selection of four

interventions to be studied – was adequate to the research interest as well as the necessary balance between variety and opportunity to learn. The interventions used different strategies, were implemented in different locations and times, targeted different audience segments, and aimed for different behaviour change outcomes. Their creators were all willing to provide the information necessary to create the case studies and to meet with the author for an interview.

The final selection of cases included the following interventions:

Name of the intervention	Initiating organisation	Behavioural objective	Use of new technologies
Speel je Fit	Dutch Football Association (Koninklijke Nederlandse Voetbalbond, KNVB)	More movement and playing football after school	YouTube videos featuring famous ambassadors and their sharing through social media
#7dagenwater	Youth on Healthy Weight (Jongeren Op Gezond Gewicht, JOGG)	Drinking clear water instead of soft drinks	A week-long Instagram-based challenge initiated by a vlogger in her YouTube music video
Hello Yoop	Yellow Riders and Rijnstate Hospital	Adopting healthy nutrition and movement habits	A mobile game featuring a virtual pet companion
Charge Your BrainzZz	Brain Foundation (Hersenstichting)	Learning about the rules and positive effects of healthy sleeping	An action mobile game for healthy sleep-related homework

Data collection and analysis

In accordance with Stake's (2010) understanding of case study research, the emphasis was put on qualitative data in this research. Two phases of data collection could have been distinguished: First, the author investigated resources which were available online. At that time, the goal was to obtain a preliminary insight into the case and its context and to identify the key strategies which had been implemented. Second, the author conducted four semi-structured interviews with the interventions' creators with the average length of one hour. The primary purpose of this interview was to fill in all the gaps in the understanding of the case, and the questions were prepared according to the extent of information available in the first phase. Details on the planning and conducting of the interviews can be found in the next sub-chapter.

When describing the role of documents in case study research, Yin (2014) argues that they can bring a broad range of specific information; however, documents may also

be difficult to access and biased due to the researcher’s selectivity and the reporting of the document’s author. The author realised both the positive aspects and downsides of documents during the data collection process. On the one hand, the data derived from the documents below allowed for a rather detailed reconstruction of the cases. On the other hand, the extent of collected data was not equal across the analysed cases. JOGG and Yellow Riders did not wish to disclose most of the research insights and evaluation data, either because of their partners or themselves. The Brain Foundation did not yet possess the findings of their evaluation research. Contrarily, KNVB provided the author with elaborate campaign reports in English with all the details including the quantitative assessment of the campaign’s success. However, since the multiple case study design applied was not comparative, these disparities in collected data were just a minor limitation. A more considerable limitation can be seen in the translations from Dutch to English which the author often must have carried out when analysing the interventions’ websites and other resources. Both the case reports and interpretative findings could have been slightly skewed due to the language barrier.

Nevertheless, the creators were all willing to disclose information regarding the primary strategies and new technologies used in their interventions; in combination with the personal interviews, the author collected enough data to investigate the cases with regard to the central research issue. The following resources were used to reconstruct the interventions:

Intervention	Media content	Websites	Articles	Unpublished documents
Speel je Fit	Speel je Fit YouTube channel (Hartstichting & KNVB, 2016); recording of Peter Legter’s presentation about the intervention (Soccerex, 2017)	World Heart Federation (www.world-heart-federation.org); CROWD, KNVB’s communication agency (www.thecrowdgoeswild.nl)	article about the campaign on KNVB’s website (KNVB Media, 2017)	A healthy heart your goal – final report (Hartstichting, UEFA, KNVB & World Heart Federation, n.d.); Speel je Fit – evaluation report (Hartstichting, KNVB & CROWD, 2017)
#7dagenwater	music video initiating the campaign (Teske, 2016); #7dagenwater Instagram profile (JOGG, n.d.a);	DrinkWater initiative (www.overopdrinkwater.nl); JOGG (www.jongerenopgezondgewicht.nl)	article about localized DrinkWater campaigns (Alles van IJsselstein, 2013); article about the	leaflets and handouts used as part of the DrinkWater projects (JOGG, n.d.b)

	user-created Instagram content including the #7dagenwater hashtag (www.instagram.com)		campaign (Mirande, 2017)	
Hello Yoop	Hello Yoop game for Android (Yellow Riders Foundation, 2017)	Yellow Riders (www.yellowriders.com); Hello Yoop (www.helloyoop.com)	two articles about the game (Arnhemse Koerier, 2017; Margot, 2017)	none
Charge Your BrainzZz	Charge Your Brainzzz game for Android (Grendel Games, 2017)	Brain Foundation (www.hersentiching.nl); Grendel Games (www.grendel-games.com); Charge Your Brainzzz (www.chargeyourbrainzzz.nl)	two articles about the game and its promotion (Chrono@Work, 2016; Chrono@Work, 2017)	none

Both the collection and analysis of data were conducted with the triangulation principle in mind. Stake (2010) regards triangulation as a process of using multiple information sources and inspecting the case from different points of view, thus minimising the probability of false or biased interpretations. Yin (2014) continues the advocacy of triangulation by arguing its importance in the data processing phase. A model described as the “convergence of evidence” (Yin, 2014, p. 121) should be applied – information from all the different resources should be extracted, analysed and interpreted in a single coherent process rather than deriving fragmentary findings from the respective resources. In the interpretative phase of case study research, the researcher’s mission is to reconstruct the story of the case, retrace meanings in the case’s activities and contexts, connect real-world practice with the academic concerns and debates, and offer their critical interpretations and observations with regard to the central research issue (Stake, 2010). The interventions were analysed from the social marketing perspective. However, despite the fact that the case reports include some quantifiable results, no attempt was made to evaluate the interventions’ effectivity and cost-efficiency quantitatively. To comprehend the creation process and strategies of the interventions, the fundamental social marketing concepts described in the theoretical framework were applied.

Interviews

Visiting the interventions' physical places of origin and interviewing their creators in person was possibly the most intriguing and inspiring part of this research. This experience provided the author not only with unique insight into the cases and issue of interest, but also with a glimpse into real-world practice highly valuable for the author's future research and career in this field. In all the cases, the author succeeded in his efforts to connect with the people who were actually in charge of the interventions (project leaders), and these people were then the interviewees. With one exception, all the interviews were conducted in the interviewees' workplaces, which undoubtedly enhanced the quality of the dialogues and the interviewees' concentration on the issues of interest.

The interviewees were:

Name	Organisation	Position
Peter Legters	KNVB	CSR Project Leader
Ellis Koster	JOGG	Marketing Advisor
Stephan Aarts	Yellow Riders	Founder and Director
Koko Beers	Brain Foundation	Project Leader

These experts would most probably not introduce themselves as social marketers, but at least within the context of the cases studied, they all adopted the role of social marketers to a certain extent. Because of the thesis' focus on the potential and limitations of using new technologies in healthy lifestyle interventions, interviews were conducted only with the initiators of the projects. However, interviewing experts from the partnering communication agencies which had delivered the promotional campaigns of the interventions could provide additional revelatory insights, especially about the reasons for choosing specific media platforms and communication tactics. Additionally, it is important to note that all of the interviewees agreed with being recorded for the purpose of subsequently creating interview transcripts, which can all be found in the Appendices and provide the reader with an opportunity to interpret the interviews themselves.

According to Yin (2014), both the strengths and weaknesses of interviews as a source of information for case study research stem from the same two characteristics – the interview's subjective nature and researcher's influence. Interviews can be easily directed at the issue of interest and have a unique ability to reveal the meanings of actions within the case as well as the personal attitudes and perceptions of the interviewee. However, response bias, wrongly formulated questions, and the interviewee's subconscious tendency to provide the interviewer with the information they seek can all

lead to misrepresenting findings. The author aimed to incorporate these benefits and limitations of interviews into the planning process and tried only to ask open questions which would not guide the interviewee to the “correct” answer.

The outlines of the interviews were created with regard to the information collected in the first phase of the research. Before the start of the interview, the author briefly introduced his research. In the first part, he asked the interviewee questions concerning the specific intervention with the aim to fully understand all its aspects, especially those related to the use of new technologies. The principal objective here was to acquire all the necessary information about the intervention’s strategies and use of new technologies without pushing forward the hypotheses from the theoretical framework. This part was particularly useful for reconstructing the cases’ stories in the Results chapter. In the second part, the interview was directed more clearly to the central research issue; questions were asked to reveal the approach, ideas and perceptions not so firmly anchored in the context of the particular intervention. The contribution of this part can be seen especially in the Discussion chapter of this thesis.

2.2 Results

This chapter presents the four cases of Dutch healthy lifestyle interventions listed above. In each case report, Stake (2010) suggests, case study researchers ought to provide the reader with rich descriptions, thus enabling them to comprehend the case in all its contexts holistically. However, due to the research objectives and the number of cases studied, the case descriptions presented below are not as thick as they would have been if a singular case study design had been applied. Only essential background and data relevant to the research issue are included in the reports. Nevertheless, the author inspects the cases from the perspective of social marketing and provides an overview of their most essential elements with a particular emphasis on the role of new technologies within the interventions targeted at children. To enhance the reports’ lucidity, two measures taken. First, the respective information resources are not further cited in the reports. The reader can find all the resources used in the Method chapter. Second, the case reports were clearly structured to include the following sub-chapters: executive summary; background and objectives; intervention; evaluation. Additionally, to stimulate the reader’s imagination and facilitate their understanding of the cases, the author included some visuals for each intervention in Appendices no. 1-4. Key findings addressing the central research issue will be presented in Discussion. The case reports below focus solely on

reconstructing and describing the interventions, their strategies, tactics and use of new technologies.

2.2.1 Speel je Fit

Executive summary

Speel je Fit was a short-term intervention implemented by KNVB and The Heart Foundation during Women's UEFA EURO 2017 in the Netherlands. Its primary objective was to promote playing football and active lifestyle in general among children aged from 8 to 12. KNVB's communication agency created nine videos in which nine celebrity ambassadors presented their own easily replicable football exercises in a simple, fun manner. These videos were promoted online through a range of social media platforms. To activate the central message – that movement, and football, in particular, are fun and exciting, a tour around schools was organised along with engaging activities for children in the tournament's fan-zones. The use of YouTube as the primary communication channel proved to be both efficient and cost-effective. However, this tactic was successful only as part of the integrated campaign approach, in which offline activation efforts also played a crucial role.

Background and objectives

In 2017, the World Heart Federation and UEFA partnered with the Heart Foundation (Hartstichting) and KNVB to raise awareness about heart health issues before and during that year's Women's EURO football championship, which was hosted in the Netherlands. The jointly created initiative A healthy heart your was targeting women and children and its main objective was to promote active lifestyle as the best prevention of cardiovascular diseases, the no. 1 killer worldwide. Speel je Fit, which can be translated as Play Fitter, was a part of this overarching campaign, along with Active Match App, a mobile app encouraging people to walk and cycle to the tournament's stadia, or an online fitness challenge called #MatchFitWomen. The ultimate goal of this intervention, which was a part of a long-term collaboration between the Heart Foundation and KNVB, was to motivate children to move and play (football) more. More than 3 out of 4 children under the age of 12 were not meeting the national exercise norm for good health. KNVB identified sedentary lifestyle as the primary villain, with video games and other new technologies as major contributors. The primary objective was twofold: increasing awareness about a healthy lifestyle and activating the target group to move more. The

project was well in line with KNVB's long-term CSR strategy to promote a healthy lifestyle among children. However, since it was partially a CSR project of KNVB, Speel je Fit also had secondary objectives: promoting football as a healthy sport for all and attract attention to the Women's EURO tournament.

Intervention

Speel je Fit targeted primarily children aged 8-12, one of the reasons being that Dutch children usually start playing football at approximately this age. KNVB wanted to promote movement among this age group and identified the Women's EURO tournament as the perfect opportunity for that. Regarding geographic segmentation, the intervention focused on children living in the tournament's host cities and their suburbs to capitalise on the general excitement revolving around the championship. According to Peter Legters (Appendix 5), the Project Leader of Speel je Fit, KNVB made use of cognitive dissonance when designing the intervention: *"We were making them try different football exercises and they would realise that movement is actually more fun than other unhealthy behaviours. When creating behaviour change, you have to focus on activation. People usually already know what's good for them and what's not."* Instead of providing changing children's attitude with information and hoping for a subsequent change in their behaviour, KNVB aimed to instantly mobilise children to find out on their own that football and other movement activities are fun.

As Peter Legters (Appendix 5) noted, *"one of the research insights that we used was that role-models are very important for this age group."* The central idea was thus to create nine simple football exercises endorsed by nine celebrity ambassadors (Dutch football players, singers, TV presenters and vloggers), which could be easily replicated even on the street. This idea was well-corresponding with KNVB's "Like a Pro" philosophy, through which the organisation has been inspiring and motivating children to make progress their exercising and eating. Playing football was thus positioned as something fun, but also as an activity which needs practice and allows for individual progress and skills improvement.

Initially, KNVB had a mobile app in mind as means of delivering the nine exercises to children. However, their partnering communication agency CROWD advised them not to develop any apps for such a short-term intervention mainly because of their expensiveness. CROWD also conducted research into the target audience's media habits, which concluded with two key audience insights: children aged 8-12 spent on average 1

hour per day watching YouTube videos; vloggers were children's heroes. The creators regarded social media as an environment which is largely popular among this age group and would enable them to reach the target audience quite easily. The agency made nine videos with the ambassadors (Appendix 1, Picture SP2) and was promoting them on YouTube as well as other social media channels. Since the children were often watching football-related videos on YouTube, the videos had excellent organic reach. Moreover, the ambassadors also helped with sharing the videos on their profiles on Instagram and Snapchat. The videos were around 4 minutes long and featured the respective ambassadors explaining their exercises in a comprehensible, humorous manner. KNVB did not want to ask children to do anything online such as sharing their own videos on YouTube, mainly because *"it is not even legally allowed to ask children under 16 to do specific online tasks without their parents' supervision."* (Peter Legters, Appendix 5). Moreover, because *"the engagement rates of previous KNVB's social media efforts were pretty low"* (Peter Legters, Appendix 5), the organisation did not aim to create any viral content. The videos' purpose was rather simple: to present the exercises and get children outside. Other online tactics were used to raise awareness about the campaign, such as the Speel je Fit theme song by Elindo Avastia or Totally Fit Kidz, a TV programme also featuring this popular young musician.

However, KNVB knew they had to approach children offline as well to activate the online campaign's message. They organised a tour around 12 primary schools and prepared a small football festival in each of them (Appendix 1, Picture SP1). Moreover, Speel je Fit was present in the fan zones surrounding the tournament's stadia (Appendix 1, Picture SP3). Both the fan zones activation and school events enabled the intervention to engage with the children in person and motivate them to try the football exercises in that very moment and experience the positive feelings connected with movement on their own. As part of the offline events, Speel je Fit staff were handing out themed t-shirts, posters, balls and booklets with the exercises' descriptions, all featuring the campaign's logo – a football with a heart (Appendix 1, Picture SP4).

Evaluation

The delivery of Speel je Fit's message was ensured by a coordinated effort combining different offline and online communication channels, and the creators were contented with the performance of all of them. YouTube videos with the exercises reached more than 340 000 views and were, according to the 200 children interviewed in the

evaluation research, easily comprehensible, credible and funny. Elindo Avastia's catchy theme song starring the ambassadors stayed in the Kids' Top 20 hit chart for 20 weeks and was played on Spotify and YouTube more than 16 000 times. The Totally Fit Kidz programme had over 128 000 impression on TV and online combined. Generally, the creators regard their use of social media in this intervention as highly cost-effective.

Speel je Fit was present in 7 fan-zones for 29 days and engaged with around 16 000 children fans, with more than 75% of them leaving with the plan to practice the exercises at home, according to the post-interviews in the fan-zones. In each of the 12 schools visited, the intervention engaged approximately 500 children and reached their parents as well. However, as Peter Legters highlighted in the interview, the intervention's staff saw in person that the children were genuinely enjoying football and movement by virtue of Speel je Fit, and that was even more important than the numbers. The goal of making children more active is of course very challenging to measure. However, both KNVB and the Heart Foundation were highly satisfied with the intervention's course, reach and results. As Peter Legters (Appendix 5) put it, *“the evaluation was definitely a weak point of the campaign, and we are well aware of it. (...) Judging the success of the campaign by the number of video views was a paradox because we didn't really want to make children spend more time on YouTube, of course. (...) We saw that a few thousand children were enjoying playing football thanks to our campaign – I think that's the most important thing.”*

2.2.2 #7dagenwater

Executive summary:

Youth on Healthy Weight (JOGG) and its commercial partner Spa created the social media-based #dagenwater challenge to target teenagers as part of JOGG's long-term clean water-promoting efforts. Research insights suggested that girls from 12 to 15 would be easiest to reach. Also, it was found that they were listening more to vloggers and other influencers than to their teachers and parents. For this reason, JOGG partnered with Dutch vlogger Teske, who created a water-themed music video connected to a week-long challenge of drinking only water. Together with Teske's and JOGG's other social media content, the music video sparked wide adoption of the challenge – many Dutch girls from all over the Netherlands participated in the challenge and shared their own content through social media. Both JOGG and Spa were highly contented with the

campaign's reach and engagement, which built a solid basis for future localised water-promoting efforts in JOGG's partnering schools and municipalities.

Background and objectives:

JOGG is an organisation whose principal activity is the development of so-called JOGG approach. Employing public health professionals as well as communication experts, JOGG's mission is to create health promotion concepts and strategies, which can then be adopted and adapted by partnering Dutch municipalities. The organisation aims to tackle overweight and obesity of Dutch youth by creating healthier environments in cooperation with the government, schools, municipalities, parents and commercial partners. One third of Dutch municipalities has already been tailoring JOGG's healthy lifestyle promotion concepts to their local contexts and needs. These intervention concepts aim to promote healthy eating, sleeping and movement. JOGG has already used social media in some of the previous campaigns, such as Free Movement or The Daily Mile, both promoting movement among school-aged children. DrinkWater is JOGG's overarching theme for the promotion of drinking clean water instead of soft drinks among children aged from 0 to 19, which are the cause of children's average intake of 26 sugar cubes per day. The organisation prepared a micro-site on this topic, inviting all Dutch schools and municipalities to participate by making use of the facts and sample campaign materials and ideas provided. Since its introduction in 2012, the DrinkWater concept has been adopted and localised in many Dutch schools, which can create their own interpretations of the concept: localised posters, leaflets, handouts for parents, themed weeks and events including water games and experiments. However, as Ellis Koster, JOGG's Marketing Advisor, noted, until 2016, DrinkWater's messages were successfully conveyed mainly to children aged 0-12 through children daycare and primary schools. *"Our DrinkWater efforts weren't very interesting for adolescents from 12 to 19. We had to find another proposition for that segment."* (Ellis Koster, Appendix 6) Therefore, JOGG decided to find a different approach to reach teenagers with their water promotion efforts. Coincidentally, one of JOGG's commercial partners, water brand Spa, also aimed to promote drinking water among teenagers.

Intervention:

JOGG and Spa had cooperated before; however, this was their first shared effort to address children aged 12-19. The organisations realised that the difference between

boys aged 19 and girls aged 12 was too significant to bridge. One of JOGG's partner's research suggested that the segment of girls aged 12-15 should be the easiest to reach among teenagers because of their somewhat positive attitude towards clean water. Further research then found that Dutch girls of this age were tired of being taught what is healthy and what is not over and over again. They were already aware of the health benefits of drinking clean water. Another research finding was that teenage girls could not be reached through parents and schools anymore, instead, they were listening to vloggers and other influencers. "Our research found out that social media was the best way to reach this target audience." (Ellis Koster, Appendix 6) For this reason, JOGG and Spa decided to create a nationwide, social media-based campaign.

JOGG's #7dagenwater (#7dayswater) as a locally adaptable concept can be considered a social marketing intervention; however, in the case of the national challenge, it will be more accurate to use the campaign label instead. The seven days-long social media-based challenge took place between November 13 and November 20, 2016. The campaign's fundamental element was famous Dutch YouTube vlogger Teske, who had been promoting healthy lifestyle habits on her own before. Ellis Koster (Appendix 6) highlighted the role of Teske as a highly authentic messenger: *"She was very popular with the target audience, and she was also very interested in healthy lifestyle and had a history of vlogs on it. It was a perfect match. Some of the other vloggers were working with candy brands as well; the message wouldn't be very authentic or believable if conveyed by them."*

JOGG and Spa provided Teske with funds to write a theme song, *In Mijn Glas*, and create a professionally executed music video (Appendix 2, Picture DW2), which became the central media product of the campaign. In the video, Teske invited her followers and all the other Dutch teenage girls to participate in the challenge with her and drink only water for the next seven days. Additionally, Teske encouraged them to share their own water-related pictures on Instagram and Snapchat, thus spreading awareness about the challenge among their friends and peers (Appendix 2, Picture DW4). During the challenge week, Teske was creating and sharing her own water-related content and messages through Instagram, Snapchat and YouTube, naturally accompanied with the #7dagwater hashtag. JOGG also contributed to the campaign with Instagram and Facebook content, usually in the form of water-related photo tips (Appendix 2, Picture DW3) and ideas for variations of clean water, such as putting different types of fruit in water bottles. Variation of taste was among the key values JOGG and Spa aimed to

promote because previous research into the girls' drinking habits had suggested they had considered drinking water as something boring. For this reason, JOGG and Teske tried to position drinking water as fun, tasty, healthy and most normal behaviour. However, regarding the healthiness of drinking water, no factual information was communicated apart from the benefits of clean water to the quality of one's skin, which was important for the target audience. In the beginning, the campaign was naturally most successful in reaching Teske's social media followers and girls active on YouTube. However, the message was meant to reach other girls during the challenge week as well through their friends' posts and everyday in-school interaction. Additionally, the challenge week was followed by a two weeks-long campaign involving catering companies, which were promoting clean water in Dutch schools (Appendix 2, DW1). Moreover, the concept of a week-long water-drinking challenge was offered to all of JOGG's partnering schools and municipalities, many of which have already implemented their adaptations with local influencers.

Evaluation:

Initially, JOGG was aiming to research the change of attitudes and behaviours as part of the evaluation plan. However, their partners advised them to focus solely on social media measures when evaluating such a short-term project. Both JOGG and Spa were highly contented with the campaign's reach: *"Our evaluation plan consisted mainly of engagement numbers on social media, and those were all exceeded. (...) We didn't spend much money on advertising and the girls we targeted were still reacting to our campaign."* (Ellis Koster, Appendix 6) Teske's music video has now over 234 000 views, 6 900 likes and 1 200 comments, and was very well accepted by her followers. Her complimentary content on Snapchat and Instagram performed beyond expectations as well. With only very limited advertising expenses, the campaign resulted in significant reach and can be considered highly cost-effective in this respect.

2.2.3 Hello Yoop

Executive summary:

Hello Yoop is a Tamagotchi-like mobile game featuring a virtual pet companion which needs to be taken care of. Children are encouraged to keep this pet called Yoop happy by moving more, eating healthier and resting better each day. By making the children feel healthy, the app teaches them to motivate themselves to adopt and sustain a

healthy lifestyle. Initially, the app was developed as a digital obesity-treating tool developed for Rijnstate Hospital in Arnhem; however, it was later redesigned to function as an obesity prevention game and is now available to all children in the Netherlands. Numerous motivational mechanisms such as incentives, social comparison, progress tracking or entertaining mini-games are implemented in the game to ensure that children will adhere to the game's six-months-long programme, which was developed in cooperation with a lifestyle coach, behaviour change expert and obesity paediatrician. The development process was rather lengthy and costly; nevertheless, the results suggest that the game could be very effective especially for some children. Yellow Riders, the company in charge of the game's development, is now planning further innovations to the game, such as personalisation or entering diary records with voice.

Background and objectives:

The Yellow Riders company presents itself as a developer of so-called serious games – playful approaches towards serious (health-related) issues. Its vision is to facilitate behaviour change, treatment and rehabilitation in a fun, easy and exciting manner, thus contributing to the fields of healthcare and public health. The company's Hello Yoop project, formerly called NObesitas, was initiated by Rijnstate Hospital in Arnhem. The hospital created a six-months-long obesity treatment programme; however, its pilot phase revealed that involving so many specialists for such a long time would be far too costly. Therefore, the hospital approached Stephan Aarts and his company Yellow Riders with a challenging task – to develop a digital tool which would allow the doctors to stay in touch with obese patients nonstop, and which would constantly be supporting the children on their journey to a healthy lifestyle. The project was financed by Rijnstate Hospital, the province of Gelderland, and the investment of Yellow Riders. Three professionals were asked to participate in the development process as expert advisors: lifestyle coach Marjolein Postma, behaviour scientist Roel Hermans from Radboud University, and obesity paediatrician Saskia Bouma from Vrije Universiteit Medical College and the Slotervaart Ziekenhuis hospital.

Intervention:

Yellow Riders aimed to twist the common image of games as a significant contributor to sedentary lifestyle and obesity. The company wanted to capitalise on the inherent ability of games to motivate people and organised a two-day challenge for Dutch

game studios. The winning concept was a Tamagotchi-like virtual pet companion, present at all times in children's pockets in the form of a mobile app, continually nudging them towards a healthier lifestyle. However, these nudges were not invasive at all. The app was created to provide moral support, set up a clear trajectory towards the adoption of healthy habits, and offer advice or intervention when needed. The game's central objective was to teach children to motivate themselves rather than motivating them externally. The app suggested that in order to keep Yoop healthy and happy, children needed to move more, eat healthier and sleep well. Children were reminded to have a good breakfast, eat small portions of healthy food during the day, walk at least 10 000 steps each day, drink at least eight glasses of water instead of soft drinks and spend a few minutes on meditation. As Stephan Aarts (Appendix 7) noted, "*children have many distractions in their lives – computers, TVs, mobile phones – therefore, we also focused on implementing instructions for resting well, meditation and so on.*" They were also reminded to feed Yoop along with themselves and watch his (and their) calories. Children were doing all of this with Yoop, but the creators ensured they would not be spending too much time using the app. The main idea was that after making children feel healthy, they would naturally change their attitude from "I need to do this for Yoop" to "I need to do this for myself".

Additional motivational mechanisms were implemented in the game to ensure that children would complete the six-months-long programme. Children could track their activities and progress and be provided with data about their habits and patterns. For each completed day, they would receive a sticker, and for each completed month, they would receive a wristband. These incentives also functioned as a socially motivating element because children were naturally comparing themselves with their classmates and siblings. Points earned in the game could be exchanged for further customisation of their Yoop (Appendix 3, Picture HY1) or material incentives, such as a trip to ZOO with their family. Children were invited to earn more points by playing educative mini-games related to healthy habits, which had been designed in cooperation with children themselves. However, Yellow Riders largely reduced this feature in order to minimise the number of distractions in the game.

Initially, the target audience was the youth obese patients of Rijnstate Hospital aged from 12 to 16. In this phase of the project, the game was supposed to function as a treatment tool facilitating the lifestyle improvement of obese children before they would move from primary and secondary schools to high schools. After the successful implementation of this treatment tool, the game was then redesigned to serve as a means

of prevention. Yellow Riders removed the medical elements of the app but maintained the format of a six-months-long programme with continuous progress. After the first six months, the app remains perfectly usable, but there are no incentives available in exchange for points anymore. According to Stephan Aarts (Appendix 7), the lack of incentives does not discourage children from continuing using the app: *“According to our data, children still use the app to check whether they are doing well or not and to learn a bit more.”* Since July 2017, this version of the game has been available to the public via App Store and Google Play, with all Dutch children aged 8 or more as the primary target audience and their parents as the secondary target audience. Yellow Riders’ PR agency suggested that vloggers would be the most effective means of promotion in this case. For that reason, the company invited popular Dutch gaming vloggers to the launching event in Soonsbeekpark in Arnhem, where they had created a GPS-based track that children could follow to earn more points and rewards (Appendix 3, Picture HY2). As an accompanying promotional effort, a regular summer prize draw was held every week – every child who had completed at least five days in the past week had a chance of winning a child-friendly WIKO Smartphone. Regarding future promotional efforts, Yellow Riders plan to create more partnerships with vloggers, include schools and hospitals in their communication strategy, and create more GPS-based tracks for the game in parks all around the Netherlands.

Evaluation:

The development process of Hello Yoop required substantial investments regarding both time and funds. However, according to the available results, *“this mobile game is the best tool for healthy lifestyle promotion at least among some children”* (Stephan Aarts, Appendix 7). Unfortunately, Yellow Riders’ evaluation data were non-disclosable, which prevented the author from drawing any more conclusions concerning the intervention’s effectivity. Nevertheless, Stephan Aarts was contented with the forepassed phases of the project. His company now plans to attract more Hello Yoop players and also to implement significant improvements in the game, such as entering their food diary records with voice or automatic personalisation: *“We want the app to reflect the preferences of the child. With data analysis and automatic personalization, the app should be even more effective.”* (Stephan Aarts, Appendix 7)

2.2.4 Charge Your BrainzZz

Executive summary:

One of the Brain Foundation's lines of activities consists of educational and prevention projects concerning mental health and well-being. In September 2017, the foundation, together with partnering organisation Chrono@work, released innovative learning package Charge Your BrainzZz, which was created to educate children aged 12-15 about the importance of healthy sleep and encourage them to adopt key healthy sleeping habits. This package included a rich variety of materials for three 45 minutes-long biology lessons and was promoted among teachers to be downloaded and implemented in their classes. Despite the fact that new technologies were identified as one of the major contributors to the poor quality of sleep among youth, the pupils of the participating classes were asked to play a mobile game as their homework. This serious game was also conveying the key messages of the learning package; however, its primary purpose was to serve as an entertaining and engaging benefit.

Background and objectives:

The Brain Foundation's mission is twofold: supporting people with brain disorders and helping them to fully participate in society; raising funds for and organising prevention projects which help to keep the brains of the Dutch healthy for as long as possible. In October 2016, the foundation partnered with Chrono@work, a chronobiological spin-off company of the University of Groningen, which provides researchers, health professionals and commercial companies with support and knowledge on sleep-wake rhythms and their impact on people's health and well-being. This partnership aimed to tackle sleep deprivation among children and youth. Chrono@work identified the age group of 12-15 as a vulnerable segment due to the significant hormonal, physical and social-environmental changes these children were going through. According to the company, the discrepancy between these children's sleeping needs and patterns often lead to sleep deprivation, which was deemed to be a common cause of poor academic performance, behavioural problems, decreases in mental well-being and a higher risk of alcohol and drug abuse. New technologies such as computers, tablets and smartphones, were identified as a major contributor to the damaged sleeping patterns of this age group. As Koko Beers (Appendix 8), Project Leader at the Brain Foundation, mentioned: "*We didn't do our own research on this, but we extracted some insights from the literature. One of these insights was that children were indeed spending a great part*

of their evenings and even nights with their mobiles and computers, so we knew that was something which needed to be addressed in the learning package.” The objective of this partnership was to develop an educative programme informing children about the importance of quality sleep for their well-being and everyday life and encouraging them to adopt healthier sleeping habits.

Intervention:

Chrono@work’s research found out that the best way to reach this target group was through their biology class, preferably in the second or third year of biology when the curriculum was matching the intervention’s topic the most. The children had already entered puberty but were still willing to listen to school and teachers. The secondary target audiences were teachers and parents. Healthy sleeping was supposed to be positioned and communicated as a behaviour which would make children feel, look, and perform in school much better. *“We wanted to make the learning process fun, but the desired behaviour itself was not communicated as fun.”* (Koko Beers, Appendix 8) Additionally, the intervention’s creators wanted to show the target audience that healthy sleeping is not only highly beneficial to their daily life but also rather easy to adopt. The Brain Foundation decided to create a modern learning package consisting of three 45 minutes-long lessons, for which Chrono@work then created the contents. These included a wide variety of teaching methods and tools, such as card games, discussion exercises or interviews with parents. Additionally, in the initial research, both children and teachers expressed the wish for animated introductory videos (Appendix 4, Picture CB3) for each lesson as well as some game. For this reason, the partnering organisations asked Grendel Games to develop a serious game, which would add more engagement and entertainment to the package while also conveying the key messages of the learning package. Another digital platform included in the package was the Charge Your BrainzZz website, which provides children, teachers and parents with comprehensible information about healthy sleeping as well as some tips for adopting a healthier sleeping pattern. Moreover, the website offered a chronotype calculator and served as the central delivery channel of the package to teachers who were interested in using the materials in their class. In all the website’s sections, new technologies were mentioned among the main contributors to unhealthy sleeping because of the energetic signals and blue light they were conveying.

The Charge Your BrainzZz game (Appendix 4, Picture CB1) served as an entertaining homework element. Although the key information from the lessons was

incorporated, the primary purpose of this 3D action game indeed laid within entertaining the pupils and making them more interested in the issue. As Koko Beers (Appendix 8) explicitly stated, *“the game is a nice element to have in the intervention, but it wouldn’t create a change in behaviours on its own, it needs some context and information.”* The game’s story revolved around a sleep-inducing wizard called Sandman who wanted to retire and leave his duty of helping people with asleep to his successor, the player. The first level (Appendix 4, Picture CB2) included mainly fighting and collecting enchanted objects related to healthy or unhealthy sleep. The two other levels, which were only accessible with a code received from the teacher, were more complicated and included features such as blue light or energy drinks. In order to prevent pupils from spending too much time playing the game in the evening, the collection of points was blocked after 8 pm. The Charge Your BrainzZz website features a leaderboard where children could compare themselves with each other and get motivated to earn more points. Moreover, the Brain Foundation announced a contest for the best gamer ending on May 1, 2018, who would win a trip to a museum with his class.

Both the modern educational package and mobile game were launched on September 27, 2017. The first schools to implement the learning package were located in Groningen because of Chrono@work’s contacts; however, the intervention was later spread across the whole Netherlands. Apart from a launching event, social media advertising, newsletters and public relations efforts were all used to promote the package among teachers. All these communication channels lead to the Charge Your BranizZz website, where teachers were invited to download the package and include it in their biology class.

Evaluation:

Since its launch, the learning package has been downloaded by teachers more than 300 times. Initially, the Brain Foundation aimed to set up specific quantifiable goals concerning the intervention’s reach. However, since the project is still in its pilot phase, the foundation still focuses on the qualitative feedback, which suggests that the intervention has been working well and has been positively accepted among children, teachers and parents. In Spring 2018, researchers from Vrije Universiteit Amsterdam and the Public Health Service of Amsterdam will be testing the quality of sleep and sleeping habits before and after the intervention in different schools. This study is expected to offer insights for further improvement and reveal whether or not the strategy of creating a

learning package has proven to be useful with regard to the desired behaviour change. One of the elements that the foundation seeks to improve is the website: *“The website was offering the package to teachers, but at the same time it provided a sleep encyclopaedia for children and parents. The evaluation study I mentioned will reveal if using this one website for all the different objectives and audiences was a good strategy or not. In my opinion, it was a bit too much for one platform.”* (Koko Beers, Appendix 8)

The incentives also offer room for improvement, which have not been successfully implemented in the intervention yet. The Brain Foundation does not possess any research findings regarding the role of the mobile game in the intervention. However, according to available feedback, both children and teachers perceive the game as an attractive, entertaining bonus to the whole intervention. Well, it was costly, but it makes the whole package more interesting and attractive. *“But I really can’t tell if the game was cost-effective and if the benefits outweigh the investment we made.”* (Koko Beers, Appendix 8)

2.3 Methodology and Results Summary

The author investigated the four interventions above with the aim to advance the understanding of the benefits, limitations and best practice of using new technologies in healthy lifestyle promotion targeted at children as perceived by the interventions’ creators. Due to the exploratory nature of his objectives, the author adopted instrumental multiple case study design as described by Stake (2010). The cases were chosen because of their accessibility and the opportunity to learn much about the research issue which they provided. First, the author analysed available online resources such as websites, articles and the interventions’ media content. Second, he proceeded to conduct four semi-structured interviews with the interventions’ creators. Finally, he applied the triangulation principle to reconstruct the contexts, strategies and implementation of the chosen interventions.

Both KNVB and JOGG identified social media as the most effective communication channel when targeting children. KNVB ensured the wide reach of Speel je Fit, a campaign making children play football and exercise more after school, with nine YouTube videos featuring celebrity role-models. This online tactic built a solid basis for the interventions’ offline activation strategy. Similarly, JOGG capitalised on the influence of vlogger Teske when motivating teenage girls to participate in their challenge of only drinking water for seven days. Yellow Riders also opted for YouTube as an important

communication channel; however, their cooperation with vloggers only served as means of promoting their obesity-tackling mobile game. The company developed a mobile app which used gamification to help children adopt healthy lifestyle habits in successive steps and through a fun experience. The entertaining aspect of digital games was even more important for the Brain Foundation, which decided to create a mobile game as an engaging homework tool. The Charge Your BrainzZz action game was developed as part of the foundation's learning package to keep students interested in the topic of healthy sleep even at home.

The case reports above alongside the interview transcripts in Appendices no. 5-8 and the interventions' visuals in Appendices no. 1-4 enable the reader to develop their own understanding of the cases and research issue. In the forthcoming chapter, the insights derived from the case reports and interviews will be discussed with the theoretical framework of this thesis to enunciate the key findings of this research as well as their limitations and implications.

3. Discussion

The case reports above provided descriptive reconstructions of the investigated interventions, which will now serve as the basis of the author's interpretative assertions. The author does not aspire to draw any evaluative conclusions regarding the effectivity of the strategies implemented in the respective interventions. Instead, the objectives here are: First, to understand the reasons which led to the use of new technologies in the analysed healthy lifestyle interventions targeting children. Second, to reveal the general approach of the interventions' creators towards innovative tactics. Third, to briefly confront these findings with the theoretical framework developed in the literature review. After discussing the key findings, important remarks will be made regarding the research limitations and implications for social marketing and public health professionals and researchers in general, and for those targeting children in particular.

The following sections will discuss in more details the key findings, which are:

1. The creators regarded new technologies as one of the main contributors to sedentary lifestyle and sleep deprivation; however, they identified the same technologies as platforms and environments of which popularity among children can help meet their interventions' objectives.

2. Social media enabled the creators to cost-effectively reach children nationwide and engage them with their favourite role-models on a mass scale; however, authenticity, credibility and smart activation strategies were crucial for the success of social media-based interventions.

3. Mobile games were perceived by the creators as an entertaining, engaging and largely accepted healthy lifestyle intervention platform; however, both commercial and research partners, as well as the children themselves, needed to be incorporated in the development process to create an efficient and cost-effective gamified digital intervention.

4. The creators jointly called for more research evidence to reveal which new technologies indeed generate significant potential for healthy lifestyle promotion and what are the most effective ways of using them for different audiences and users.

Key Finding 1: *The creators regarded new technologies as one of the main contributors to sedentary lifestyle and sleep deprivation; however, they identified the same technologies as platforms and environments of which popularity among children can help meet their interventions' objectives.*

As mentioned in the theoretical framework, extensive use of new technologies might reduce exercise and damage sleeping patterns of children (Subrahmanyam & Smahel, 2011; Subrahmanyam & Greenfield, 2012; Valkenburg & Piotrowski, 2017). Similarly, all of the interventions' creators regarded new technologies as a significant contributor to unhealthy lifestyle among children. Yellow Riders were in agreement with Brockmyer (2014), according to whom video games can contribute to increases in the prevalence of sedentary lifestyle and obesity. The Brain Foundation likewise agreed with scholars suggesting that new technologies such as mobile phones can depress the quality of sleep and cause delayed bedtimes, thus contributing to numerous physical and mental difficulties during the day (Subrahmanyam & Smahel, 2011; Wilson & Jordan, 2014).

At the same time, the creators were also aware of their popularity with this age group. They agreed with Subrahmanyam and Greenfield (2012), who claim that new technologies have secured a fundamental position in children's lives already. Social media constitute an environment in which children enjoy spending their time, watching entertaining videos and learning new things. Playing games on mobiles and smartphones is a beloved daily routine for many children (The NPD Group, 2015). Moreover, these technologies are already well-established in children's media environment and their usage will most probably not be reduced by any means: *"To be honest, we are still not sure if it really is a good idea to encourage children to spend more time on their phones playing a game as part of an intervention which promotes healthier sleep. But I think they would be playing games on their phones anyway if it wasn't for our game."* (Koko Beers, Appendix 8) Instead of trying to battle this phenomenon, public health professionals can grasp the opportunities which new technologies bring.

According to the interventions' creators, the ultimate benefit of new technologies laid within the opportunity to reach children in their natural environment (social media) or through their favourite activities (games). While social media were favoured for their ability to ensure a wide reach cost-effectively and convey an intervention's messages authentically and engagingly, games were used as the primary intervention platform to blend the process of adopting healthy lifestyle habits with entertainment and fun. One of

the shared benefits of mobile apps and social media perceived by the creators was their permanent presence in children's phones, which allowed for frequent engagement with the intervention irrespective of time and place.

However, the creators also maintained a critical stance towards new technologies. They knew that seeking the right balance in terms of the encouraged new media consumption was crucial to avoid undesirable effects on the audience's lifestyle. Despite the continuous contact with the audience that new technologies enable, healthy lifestyle interventions must inevitably limit the technology usage they require or encourage. Motivating children through their phones to leave the phones behind was indeed a challenging task: *"It's cost-effective and you can reach your audience 24 hours a day whenever you like. But there is also the difficult challenge of persuading them to leave their phones behind with content shared on their phones."* (Ellis Koster, Appendix 6) JOGG, for instance, aimed to reduce this limitation by putting greater responsibility on parents – the organisation was working on a campaign motivating parents to set up clear rules for their children's new media use.

Key Finding 2: *Social media enabled the creators to cost-effectively reach children nationwide and engage them with their favourite role-models on a mass scale; however, authenticity, credibility and smart activation strategies were crucial for the success of social media-based interventions.*

As Peter Legters (Appendix 5) put it in the interview, "social media seemed like a place where they spend large amounts of time, and we can reach them in there quite easily." KNVB and their communication agency identified social media, and YouTube in particular, as a largely popular environment among the target audience. Videos on YouTube posed an opportunity to engage children with their role-models on a mass scale in an entertaining and authentic manner. In combination with the social media support of the ambassadors, this strategy ensured that the central messages of the campaign would spread wide and fast across the whole country with only limited spending on advertising. The cost-effectiveness of conveying health-related messages through social media is among the essential benefits highlighted by Dutwin (2010) as well as Kubacki et al. (2015).

JOGG's research indicated that teenagers were best reachable through vloggers and other social media influencers. Through Instagram, Snapchat and YouTube, their partnering vlogger Teske was able to spark a movement, motivating girls to only drink

clean water at least for the next seven days. The girls' own social media content then helped to spread the message even further. However, the mobilising effect was not the primary reason for implementing this strategy; instead, JOGG realised the potential of social media for a highly cost-effective nationwide delivery of a campaign. As Ellis Koster (Appendix 6) noted, *"the main advantage (of using social media) is that you can get quite close to the target audience in their own world, in their natural environment."* Another benefit was that the girls could engage with both Teske and their peers and support one another in the challenge. A similar point is put forth by Weinreich (2011), who suggests that social media enable to genuinely engage with a specific audience segment and create opportunities to interact with each other. Moreover, as noted by Naslund et al. (2017), better user engagement leads to better intervention outcomes. For this reason, Teske created most of the content by herself and was directly interacting with the girls on Instagram and YouTube. Additionally, JOGG realised that choosing an authentic messenger, a vlogger with a history of health-related activities was crucial to the campaign's success. This also corresponds with the suggestions of Weinreich (2011), who highlights authenticity and relevance as the key aspects of successful social media-based social marketing efforts.

Speel je Fit and #7dagenwater both used YouTube as the primary media platform because their creators' research suggested it would be an opportunity to engage with the target audience in its natural environment and ensure a wide reach at relatively low costs. However, both of these social media-based efforts must have been accompanied by activating offline tactics to induce the desired behaviour change. KNVB was well aware that the social media part of the campaign must have been only one of the intervention's elements: *"We were in contact with the children also in the fan zones of the tournament and in the schools that we went to with Speel je Fit. So, for us, the online content was just one of the parts of the campaign. The children should see the videos online, see the campaign in a fan zone, receive a leaflet about it in their school, and then they will hopefully try the exercises at home as well."* (Peter Legters, Appendix 5) KNVB's approach was in correspondence with the ideas of Balatsoukas et al. (2015) and Glik et al. (2016), who all suggest that social media should not be chosen as the sole platform of the intervention; instead, it should be accompanied by other intervention levels and tactics. In the case of Speel je Fit, the crucial challenge was to activate the message of the social media campaign offline and push the children to try the exercises in person. Without being followed by the school tour and fan-zone events, the videos would most

probably not induce any behavioural change. Similarly, follow-up activation efforts must have followed the #7dagenwater challenge to induce a long-term change in Dutch girls' drinking habits. This social media challenge raised awareness about the overarching DrinkWater initiative and laid a solid basis for its further activation in JOGG's partnering schools and municipalities.

Key Finding 3: Mobile games were perceived by the creators as an entertaining, engaging and largely accepted healthy lifestyle intervention platform; however, both commercial and research partners, as well as the children themselves, needed to be incorporated in the development process to create an efficient and cost-effective gamified digital intervention.

The Yellow Riders company saw great potential in serious games for both treatment and prevention of diseases and disorders. The Brain Foundation agreed that gamification could serve as an engaging element, while also continually stimulating the audience's motivation to adopt the desired behaviour. The approaches of both organisations were thus in line with the studies of Brockmyer (2014) and Corepal et al. (2018), which suggest that games and gamification indeed have potential to induce social change. Nevertheless, the use of mobile games in the two interventions largely differed.

According to the Brain Foundation, the mobile game in the Charge Your BrainzZz learning package did not play a crucial role; however, it was widely accepted by both children and teachers as a welcomed entertaining feature. The approach of the Brain Foundation corresponded well with the idea of Valkenburg and Piotrowski (2017), according to whom blending education with entertainment can facilitate conveying health-related messages. By engaging the children with the topic at home in a form they were used to and enjoyed, the game ensured that the children would stay interested in the issue of healthy sleep even after class and be reminded of the key information presented in the lessons. Also, it must be noted that the game had been asked for by both children and teachers in the preliminary research, which was most probably the main reason for its development. The Brain Foundation had not yet evaluated neither the game's role within the package nor its cost-effectiveness; however, the primary goal of the game undoubtedly was to provide an attractive, fun homework platform.

The case of Hello Yoop was different. Rijnstate Hospital was searching for a cost-effective solution to the budget problems of their newly developed obesity treatment programme and later decided to create a serious game, for which they hired Yellow

Riders. The main reason for creating a mobile game was thus the feasibility of digital treatment solutions along with the constant virtual contact enabled by a mobile app. Substituting the care and support of medical professionals at such relatively low costs could most probably not be done by any offline solution. With all its motivational mechanisms, material incentives and entertaining features, the Hello Yoop game proved to yield potential for obesity prevention. A similar approach towards serious games can be found in the study by Corepal et al. (2018) or in the text by Chee (2015), who argues that new technologies allow for the creation of innovative learning opportunities. However, to develop such a behaviour-changing game, Yellow Riders must have cooperated with behaviour change, medical and lifestyle experts, and “*involved children in the constant development process*” (Stephan Aarts, Appendix 7). The company aimed to tailor the intervention to the child’s life by automatic personalisation in the future. Such an innovative feature could again not be realised at such low costs as part of an offline intervention.

As Badawy et al. (2017) suggest, mobile apps can increase the feasibility of public health project. The case of Hello Yoop confirmed this idea – since it served as a cost-reducing solution to an already existing treatment programme with budget difficulties, the substantial investments in the development of the app were definitely about to return. Nevertheless, the costliness of mobile app development definitely presented an obstacle to healthy lifestyle interventions, one which is not often mentioned in the literature. As Peter Legters noted (Appendix 5), KNVB was also interested in using mobile apps; however, they were also well aware of the downsides: “*creating mobile apps, for instance, is very costly and challenging. (...) I think that apps do have some potential for healthy lifestyle programmes, but you need to invest a lot of money in it and create something outstanding. You should either do it really, really well, or you shouldn’t do it at all.*” Similar concerns were expressed by Ellis Koster. Moreover, both Yellow Riders and the Brain Foundation also suggested that creating a digital game for a public health intervention was virtually impossible without establishing partnerships and cross-sectional cooperation of social marketers, schools, governmental organisations, universities and commercial partners. When preparing their next digital intervention - a digital healthy lifestyle tool targeting people older than 50 - the Brain Foundation was planning to organise a hackathon connecting talented students with researchers, commercial partners and members of the target audience to create a genuinely feasible, research-based, behaviour change-inducing product, which would also be largely

accepted by the target audience. Such an innovative approach could yield excellent potential regarding the budget difficulties and other obstacles public health professionals must face when designing a digital intervention.

Key Finding 4: *The creators jointly called for more research evidence to reveal which new technologies indeed generate significant potential for healthy lifestyle promotion and what are the most effective ways of using them for different audiences and users.*

Many studies cited in the literature review above highlight the importance of further research for future advancements in digital health interventions. A similar consonance was found in the creators' expressions of the need for more cooperation with professionals, universities and research institutions active in the field of public health. Especially in terms of serious games, such partnerships could be highly beneficial for the researchers as they would allow them to apply their own evidence-based strategies in practice. According to Stephan Aarts (Appendix 7), *“there's a lot of evidence available from universities about the effectiveness of digital health interventions, but people don't really know about it yet. Our goal is to bring this experiential knowledge out in the streets in a very simple, fun way.”*

Ellis Koster (Appendix 6) remained sceptical towards the long-term effectivity of new technologies in healthy lifestyle interventions: *“At the moment, I am not convinced that it works in the long run. I believe that more research is needed to see if there is a potential for successful long-term digital interventions as well.”* More research is critically needed to support the effectiveness of the use of new technologies in healthy lifestyle interventions with further evidence and to identify the best practices and most efficient platforms and strategies for different audience segments. As Koko Beers (Appendix 8) put forth, the creators are not even convinced about the effectivity of different new technologies: *“People always have the urge to win and to get some kind of reward for their activity. But I'm not sure if gamification can ensure a long-term behaviour change. We're very interested in these issues, but we don't have the answers unfortunately. (...) The objective of the Brain Foundation and other organizations as well should be to do research into this and reveal which new technologies can really benefit to health promotion.”* Similar concerns can be found in the works by Duane et al. (2016) and Nollen et al. (2014), who focus on the potential of mobile technologies, as well as in

the study by Dute et al. (2016), which questions the effectivity of the different social features of social media.

As Peter Legters (Appendix 5) likewise noted, “*further research is needed to understand which behavioural mechanisms work well, perhaps even for long-term interventions.*” Another opportunity which could be grasped by healthy lifestyle interventions is the motivational potential of comparing one’s performance with friends and peers. However, including a competitive element might also backfire as it could discourage some children from participating in the intervention. As put forth by Corepal et al. (2018), longitudinal research must investigate the effects of particular gamification elements on different audience segments. Belmon et al. (2015) focus on app-based interventions in general; however, they agree that investigating the effectivity of different digital intervention strategies for specific audience segments is crucial for future advancements in this field.

Additionally, the creators found it challenging to assess the cost-efficiency of digital interventions. Researchers should strive to investigate the feasibility of different digital technologies and tactics for interventions of different lengths and objectives. Zhao et al. (2016) suggest implementing large-scale randomised controlled trials for this purpose. White et al. (2016) agree and add that developing comprehensive evaluation plans including the behavioural outcomes would be a promising strategy to improve the reporting of healthy lifestyle app-based interventions.

As Tarpley (2012) notes, the use of new technologies is becoming an increasingly important phenomenon in the field of public health interventions. Evans (2016) agrees and claims that new measurement methods must be developed to evaluate innovative digital interventions effectively. These suggestions for further research as well as all the others mentioned in the paragraphs above were clearly reflected in the concerns of the interviewed creators.

Additional findings

One of the less apparent benefits of online interventions is their availability to the public. This advantage could be particularly important for CSR projects, which should also be informing stakeholders other than the target audience about the organisation’s activities. By sharing Speel je Fit videos on YouTube, KNVB was spreading the word about their healthy lifestyle promotion efforts much faster than in the case of more

traditional offline interventions. However, this advantage was not among the primary motivations of the creators to use new technologies as the central intervention platform.

Activity tracking technologies were also deemed by the creators to be beneficial for healthy lifestyle intervention. Nevertheless, the tracking element must be accessible to all members of the target audience, ideally through a mobile phone. For instance, as Peter Legters (Appendix 5) suggested, exergames in fan-zones at football tournaments might serve as nothing but an entertaining bonus to a larger campaign due to their limited reach: *“It would be a really nice, fun feature, which could work very well. But it can’t be used for a big audience, that’s the disadvantage.”* Brockmyer (2014), Valkenburg and Piotrowski (2017) all support the potential of exergames for improving the physical health of children. However, due to their limited accessibility, exergames were not even considered by the interviewed creators to be implemented in their interventions.

The possible violation of the intervention’s inclusiveness was only one of the many limitations and dangers the creators had in mind regarding the use of new technologies. According to Subrahmanyam and Greenfield (2012), due to the uneven distribution of modern digital gadgets, using new technologies in social marketing interventions can cause further inequalities. However, since more than 95% of Dutch teenagers use smartphones (www.statista.com), basic app-based interventions seem to be rather inclusive in the context of this country.

Furthermore, both Yellow Riders and KNVB highlighted the complications caused by legal restrictions regarding children’s data and privacy. According to Peter Legters (Appendix 5), this policy significantly narrowed the possibilities of Dutch social marketers to interactively engage with children on social media and ask them to do specific actions such as sharing their own content. Stephan Aarts (Appendix 7) mentioned a similar experience: *“We wanted to create support groups for children on Facebook, for example, but there was a problem with data security.”*

Finally, the author aimed to reveal if social marketing theory and concepts can be applied to the practice of Dutch healthy lifestyle promotion. The key principles of social marketing such as the orientation towards consumers (Lee & Kotler, 2011), product positioning (Weinreich, 2011) or coordinated multiple-level effort of stakeholders from various spheres (Duane et al., 2016; Wymer, 2015) were indeed reflected in the analysed cases. Moreover, all the analysed cases reported the intention to understand the barriers to the desired behaviour with research, which is another fundamental characteristic of social marketing listed by Wymer (2015). However, it leaves no doubt that the creators

did not apply any advanced social marketing strategies and concepts when designing the analysed interventions, certainly not deliberately. The creators did not regard themselves as social marketers, although they were, in fact, creating interventions well-fitting the definition of social marketing. This supports the claims of Hall (2014), who argues that public health interventions tend to be largely based on the intuition and experience of their creators. However, it must be noted that all the analysed cases were supported with some research data; therefore, the interventions were not dependent solely on their creators' previous projects and intuition. A more surprising finding was that the creators all highlighted the importance of further research. This suggests that they were aiming to rely even less on their experience and intuition; instead, they were seeking evidence-based strategies which could be implemented and then thoroughly evaluated in a coordinated effort with partnering universities and research institutes.

Regarding the planning process of social marketing, the scheme presented by Lee and Kotler (2011) fit the investigated cases slightly better than Hall's (2014) process sequence because it positions research after identifying target audiences and setting up objectives, not before. Additionally, the following assertions could be made about the position of new technologies within the 4Ps model of social marketing: Social media served as a means of promotion in the cases of #7dagenwater, Speel je Fit and Hello Yoop. With Hello Yoop, the mobile game was the fundamental element of the whole project and could be regarded as its means of delivery of the desired behaviour. Similarly, the Charge Your BrainzZz game helped in the delivery of the learning package and its healthy sleeping messages to the target audience. Nevertheless, such applications of the 4Ps of social marketing to the analysed cases seemed to be rather inaccurate, simplifying and redundant. This finding supports the argument by Peattie and Peattie (2012), who claim that social marketing struggles to consistently translate the 4Ps derived from its commercial predecessor into practice.

To conclude this section discussing the reflection of social marketing theory in the analysed interventions, the remarks above contradict the findings of Merritt et al. (2017), who claim that social marketing is becoming a well-established domain in the Netherlands. There may be numerous projects which indeed fulfil the definition of social marketing interventions in the Netherlands; however, at least in the four cases investigated in this thesis, the creators did not have any social marketing concepts in mind when designing their interventions.

Limitations

The primary limitation stems from the application of instrumental case study research. The findings and interpretations presented in this chapter are inevitably subjective and cannot be generalised to the population of healthy lifestyle interventions. Another limitation is the thesis' focus narrowed to the use of new technologies. The analysed cases offer intriguing material in terms of real-world practice, which could be highly valuable to study in a single intrinsic social marketing case study. Such research design would allow for delving much more deeply into the intervention's positioning ideas, distribution and communication strategies, specific tactics and even quantifiable evaluation.

Moreover, the author decided only to study interventions which indeed used new technologies. However, investigating the reasons which led other interventions' creators not to use new technologies could offer a valuable comparison. Another limitation could be seen in the relativity of the term "new technologies", which can represent a wide variety of digital hardware and software. The role, benefits and limitations of these technologies would of course substantially differ.

Furthermore, the author devoted his attention solely to interventions targeted at children and realised in the Netherlands, which, at least to some extent, necessarily binds the findings above to the context of Dutch children.

Finally, the quality of this research was negatively affected by some procedural limitations, which are further described in the Method chapter. The most significant obstacle in the research process was the language barrier; not being a Dutch native speaker led to difficulties in the process of acquainting oneself with Dutch public health field as well as in the collection and analysis of data.

Implications and further research

Due to the limitations above, the implications of this research cannot be overestimated. However, the findings presented in this chapter can inspire the designers of similar interventions targeted at children and serve as guideposts to the researchers in their future studies. Social marketing and public health practitioners can acquire insights regarding the benefits and dangers connected with the use of new technologies in their efforts and imprint them onto their work. However, the implications for researchers are of a more urgent nature.

All of the interviewed creators agree that more research is critically needed to fully comprehend the issue of implementing new technologies in such interventions; this thesis thus poses a call from practitioners to researchers, arguing the importance of this research issue and inviting them to participate in the advancements in this field. Further research should focus on the long-term effectiveness of various digital behaviour change strategies for different audience segments. Additionally, future studies of this issue should devote their attention to a particular technology or digital intervention strategy. The potential of such technologies for healthy lifestyle interventions largely differs, investigating these digital platforms separately would thus allow for more accurate conclusions.

Finally, the research found that albeit the social marketing nature of their interventions, the creators did not capitalise on any particular social marketing concepts and schemes when designing and implementing their behaviour change strategies. This finding suggests that more interconnection and cooperation between social marketing researchers and public health practitioners is needed to further establish the field of social marketing in the Netherlands and other European countries.

Conclusion

The ultimate aspiration of this thesis was to contribute to the understanding of the use of new technologies in healthy lifestyle interventions targeted at children. Previous research and social marketing interventions suggested that despite being often listed among major contributors to a sedentary lifestyle, new technologies such as social media and mobile games could also create attractive opportunities for public health interventions, thus helping to decrease the ever-rising obesity rates among children and youth. The central research issue laid within the approach of the creators of such healthy lifestyle interventions. The author aimed to reveal the benefits and limitations of the use of new technologies as regarded by the practitioners. The central objective was to depict a reflection of innovative social marketing trends in real-world practice.

The goal of the first part of the thesis was to constitute a theoretical framework which would introduce social marketing in the context of designing public health interventions and encapsulate the main arguments in the debate on the relationship between new technologies and children's (physical) health. Extensive research evidence was found to support the idea that new technologies can enhance the effectivity of healthy lifestyle interventions. According to the cited studies, digital intervention designs could offer feasible, interactive, cost-effective, appealing, engaging and entertaining means of reaching the target audience and inducing behaviour change. However, numerous limitations and dangers of such practice arose from the literature as well. The designers of healthy lifestyle interventions should take into account the threats the technologies pose to children's well-being when designing their projects. Furthermore, many authors expressed the need for further research and longitudinal studies to reveal which technologies and strategies of their implementation would best work for different audience segments and desired behaviours. The reflection of this theoretical framework in the following research was twofold: First, the social marketing concepts and schemes briefly introduced in the first chapter were applied when reconstructing the cases of interest. Second, the hypotheses enunciated at the end of the theoretical framework were confronted with the findings of the research.

The second part of the thesis focused on the analysis of real-world interventions and the approaches of their creators. To provide exploratory insights into the issue of interest, the author adopted instrumental multiple case study design. The context of the Netherlands was chosen due to the country's extraordinary innovation rankings, rich

history of academic studies on innovative healthy lifestyle promotion, and rather low obesity rates. With these characteristics in mind, the author presumed that studying Dutch interventions could generate intriguing insights into the effective use of new technologies, thus inspiring other social marketing projects and researchers. The author then identified four accessible cases with large potential to learn more about the research issue: Speel je Fit, a movement-promoting campaign of the Dutch Football Association which combined social media-based efforts with offline activation; #7dagenwater, a purely social-media based national challenge promoting drinking clean water with the help of a popular Dutch vlogger; Hello Yoop, a Tamagotchi-like mobile game initially developed as an obesity treatment tool but later redesigned to function as a prevention intervention; Charge Your BrainzZz, a learning package about healthy sleeping habits which consists of materials for three biology lessons and includes an action mobile game for homework.

The data collection process consisted of two phases: First, the author analysed available online resources which offered information about the interventions' backgrounds, objectives and strategies. Second, the author interviewed the project leaders of the interventions to complement the information necessary for the reconstruction of the case, and to depict an image of their approach towards the use of new technologies in such interventions. The triangulation principle was applied to both data collection and analysis. However, the quality of this research decreased as some procedural limitations emerged. For instance, the fact that the author was not a Dutch native speaker caused difficulties in the initial research phase and allowed for slightly skewed interpretations. Moreover, due to the limited number of accessible and promising cases found, the author must have violated the rules of purposive sampling. Nevertheless, the author found four cases which were perfectly fitting the research issue, managed to collect enough data to reconstruct their contexts and strategies and interviewed professionals who were in charge of their creation.

The case reports provided the reader with an overview of the interventions and with particular attention devoted to the use of new technologies in the cases. In the discussion, further interpretative assertions were made regarding the creators' approaches. The hypotheses from the theoretical framework were all well-reflected in these findings. The creators regarded new technologies as highly promising for the design and implementation of innovative and engaging health promotion strategies. Nevertheless, they were also well aware of the downsides and jointly argued the importance of limiting digital media use within the intervention to prevent any negative

effects on children's well-being. Additionally, the results indicated that social marketing theory was not deliberately adopted by the creators, even though the nature and objectives of the interventions would allow labelling these projects as social marketing efforts.

This thesis did not aspire to provide a comprehensive analysis of the efficiency of new technologies within healthy lifestyle interventions, nor is it an elaborate comparison of different new technologies and their potential for public health efforts. Further research should address both of these objectives. The manifestation of concerns such as the cost-efficiency or the ideal role of new technologies within an intervention largely differed for social media and mobile games. Therefore, it is crucial to investigate the different new technologies separately or in a comparative design to reveal which of them can be genuinely beneficial for different audience segments and behaviour change objectives. Similarly, the cost-efficiency and conditions of effectivity of such practice must be further inspected, ideally with complex longitudinal research. There was an apparent consonance in the creators' call for these directions of future research.

To conclude, it behoves the author to highlight the subjective, exploratory nature of the instrumental multiple case study design applied, due to which the findings of the thesis are non-generalisable to healthy lifestyle interventions targeted at children. Yet the aim was not to generate objective truths, but instead to provide in-depth insights with potential implications for both theory and practice. Scholars interested in the relationship between children's well-being and emerging technologies, as well as designers of similar projects targeted at children, can extract inspiration from this research. The contribution of this thesis then also lies within the grounds it set for further research for which also the interventions' creators jointly asked. Finally, the thesis provided the author himself with real-world insights from experienced public health practitioners which are invaluable for his future research and professional activities. The challenging design, which required a highly flexible research approach, also enriched the author regarding methodology and research capabilities.

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Institut komunikačních studií a žurnalistiky FSV UK
Teze BAKALÁŘSKÉ diplomové práce

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Došlo dne: 25 -05- 2017 -1-

Čj: 2362 Příloh:

Přiděleno:

Předpokládaný název práce v češtině:

Využití nových technologií v kampaních na podporu zdravého životního stylu zaměřených na mládež: Příklad České republiky a Nizozemska

Předpokládaný název práce v angličtině:

Using New Technologies in Healthy Lifestyle Campaigns Targeted at Youth: The Case of the Czech Republic and the Netherlands

Předpokládaný termín dokončení (semestr, akademický rok – vzor: ZS 2012/2013):

(diplomovou práci je možné odevzdat nejdříve po dvou semestrech od schválení tezí)

LS 2017/2018

Základní charakteristika tématu a předpokládaný cíl práce (max. 1000 znaků):

One of the leading preventable causes of death worldwide is obesity¹. Its rates are continually increasing in both adults and children, therefore authorities view obesity as an alarming public health problem and strive to address it with different social marketing campaigns.

This thesis investigates the approach of social marketing professionals from the Czech Republic and the Netherlands towards the use of innovative technologies in downstream social marketing campaigns focused on exercise and nutriment habits of youth. It strives to reveal whether creators of such campaigns incline towards using new technologies (mobile applications etc.) in their motivational efforts. Additionally, since the Netherlands is a country with a rich history of innovative social projects and has great results in children happiness rankings², the author aims to discover whether its social marketing campaigns differ from the Czech ones, and if so, how.

1) World Health Organization: *Obesity and overweight (fact sheet)*. Updated June 2016. On-line at: <http://www.who.int/mediacentre/factsheets/fs311/en/>

2) UNICEF: *Child well-being in rich countries. A comparative overview*. Florence, Italy, 2013. ISBN: 978-88-6522-016-0. On-line at: https://www.unicef-irc.org/publications/pdf/rc11_eng.pdf

Předpokládaná struktura práce (rozdělení do jednotlivých kapitol a podkapitol se stručnou charakteristikou jejich obsahu):

- Abstract
- Table of Contents
- Introduction
- Theoretical part:
 - o Social Marketing and Public Health
 - Definition and Subfields of Social Marketing
 - Promoting Health Through Social Marketing Campaigns
 - o Children, Youth, and New Media and Technologies
 - Youth's Consumption of New Media
 - Positives and Negatives of Their Relationship with New Technologies
- Practical part:
 - o Research Aim and Questions: New Technologies in Social Marketing Health Campaigns
 - o Research Methodology
 - o Research Findings – Case Studies and Comparison

- Discussion and Conclusion
- Bibliography
- Appendices

Vymezení zpracovávaného materiálu (např. konkrétní titul periodika a období jeho analýzy):

The author will produce in total up to four case studies of social marketing campaigns from the Czech Republic and from the Netherlands, which tried to inspire youth to exercise more or eat better, and will conduct interviews with the campaigns' creators (a representative from both the agency and the client side, however, a certain flexibility will be required here).

Postup (technika) při zpracování materiálu:

Qualitative case study methodology and multiple-case design will be applied. Methods will include qualitative interviews and content analysis.

Základní literatura (nejméně 5 nejdůležitějších titulů k tématu a způsobu jeho zpracování; u všech titulů je nutné uvést stručnou anotaci na 2-5 řádků):

- **EVANS, W. Douglas and Gerard HASTINGS, 2008: *Public Health Branding: Applying Marketing for Social Change***

This book examines theory and best practices of branding and its application in public health programs. Through a series of reviews and case studies, the book argues that branding is an emerging public health strategy that needs resources and continued development of innovative methodologies to effect lasting population-level change.

- **LEE, Nancy R. and Philip KOTLER, 2011: *Social Marketing: Influencing Behaviors for Good***

A renowned textbook for the planning and implementation of programs designed to bring about social change. The authors take key marketing principles and show readers how to apply them to campaigns and efforts to improve health, decrease injuries, protect the environment, build communities, and enhance financial well-being.

- **STRASBURGER, Victor C., WILSON, Barbara J. and Amy B. JORDAN, 2014: *Children, Adolescents, and the Media***

This book provides a comprehensive, research-oriented overview of how the media impact the lives of children and adolescents in modern society. Incorporating the most up-to-date research available, the authors target areas most controversial and at the heart of debates about the media and public health - equipping students to approach the media as critical consumers.

- **TOP, Peleg and Jonathan CLEVELAND, 2010: *Designing for the Greater Good: The Best in Cause-Related Marketing and Nonprofit Design***

A comprehensive resource for designers, creative professionals, marketers, corporate communications departments and nonprofit leaders, this book showcases work from a variety of sectors including Family and Community, Animal Causes, Health, Human Rights, Environmental Awareness, Spirituality, and the Arts. The 24 case studies feature interviews with the designers for different social marketing campaigns.

- **VALKENBURG, Patti M. and Jessica Taylor PIOTROWSKI, 2017: *Plugged In: How Media Attract and Affect Youth***

This important study looks at both the sunny and the dark side of media use by today's youth, including why and how their preferences change throughout childhood, whether digital gaming is harmful or helpful, the effects of placing tablets and smartphones in the hands of toddlers, the susceptibility of young people to online advertising, the legitimacy of parental concerns about media multitasking, and more.

- **YIN, Robert K., 2013: *Case Study Research: Design and Methods (Applied Social Research Methods)***

Providing a complete portal to the world of case study research, the Fifth Edition of Robert K. Yin's bestselling text offers comprehensive coverage of the design and use of the case study method as a valid research tool. The book offers a clear definition of the case study method as well as discussion of design and analysis techniques.

Diplomové práce k tématu (seznam bakalářských, magisterských a doktorských prací, které byly k tématu obhájeny na UK, případně dalších oborově blízkých fakultách či vysokých školách za posledních pět let)

- ŠROMOVÁ, Anna: *Promotion of Healthy Lifestyle in Non-commercial Advertisement*. Charles University in Prague, Faculty of Social Sciences. Bachelor Thesis, 2015.
- FILSAKOVÁ, Petra: *Social Marketing in the Czech Republic*. Charles University in Prague, Faculty of Arts. Bachelor Thesis, 2016.
- ŠINDLEROVÁ, Hana: *Opinion of children of senior school age on physical activity, health and sport*. Charles University in Prague, Faculty of Physical Education and Sport. Master Thesis, 2015.

Datum / Podpis studenta/ky

22. 5. 2017


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TUTO ČÁST VYPLŇUJE PEDAGOG/PEDAGOŽKA:

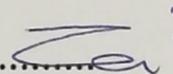
Doporučení k tématu, struktuře a technice zpracování materiálu:

Případné doporučení dalších titulů literatury předepsané ke zpracování tématu:

Potvrzuji, že výše uvedené teze jsem s jejich autorem/kou konzultoval(a) a že téma odpovídá mému oborovému zaměření a oblasti odborné práce, kterou na FSV UK vykonávám.

Souhlasím s tím, že budu vedoucí(m) této práce.

Mgr. Markéta Zezulková, Ph.D., MA, PGCE

22/05/17 

Příjmení a jméno pedagožky/pedagoga

Datum / Podpis pedagožky/pedagoga

TEZE JE NUTNO ODEVZDAT **VYTIŠTĚNÉ, PODEPSANÉ** A VE **DVOU** VYHOTOVENÍCH DO TERMÍNU UVEDENÉHO V HARMONOGRAMU PŘÍSLUŠNÉHO AKADEMICKÉHO ROKU, A TO PROSTŘEDNICTVÍM PODATELNY FSV UK. PŘIJATÉ TEZE JE NUTNÉ SI **VYZVEDNOUT** V SEKRETARIÁTU PŘÍSLUŠNÉ KATEDRY A **NECHAT VEVÁZAT** DO OBOU VÝTISKU DIPLOMOVÉ PRÁCE.

TEZE SCHVALUJE NA IKSŽ VEDOUcí PŘÍSLUŠNÉ KATEDRY.

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Appendices

Appendix no. 1: Speel je Fit in pictures (visual content)



Picture SP1: Speel je Fit activation event in a primary school

Retrieved from: <https://www.soccerex.com/media/6494/speel-je-fit.jpg?anchor=center&mode=crop&width=720&height=405&rnd=13148899261000000>



Picture SP2: Screenshot from a Speel je Fit video with actor Tim Douwsma

Retrieved from: <https://www.youtube.com/watch?v=Knq1M8gkX6o>



Picture SP3: Speel je Fit activation playground in a WEURO2017 fan-zone
Retrieved from: <https://www.boostgroup.eu/assets/Uploads/Cases/Images/IMG-6050.jpg>



Picture SP4: The logo and visual style of Speel je Fit
Retrieved from: <https://www.boostgroup.eu/assets/Uploads/Cases/Images/artboard-1.jpg>

Appendix no. 2: #7dagenwater in pictures (visual content)



Picture DW1: #7dagenwater activation in schools

Retrieved from: <https://pbs.twimg.com/media/DXrRne3WkAApwy9.jpg>



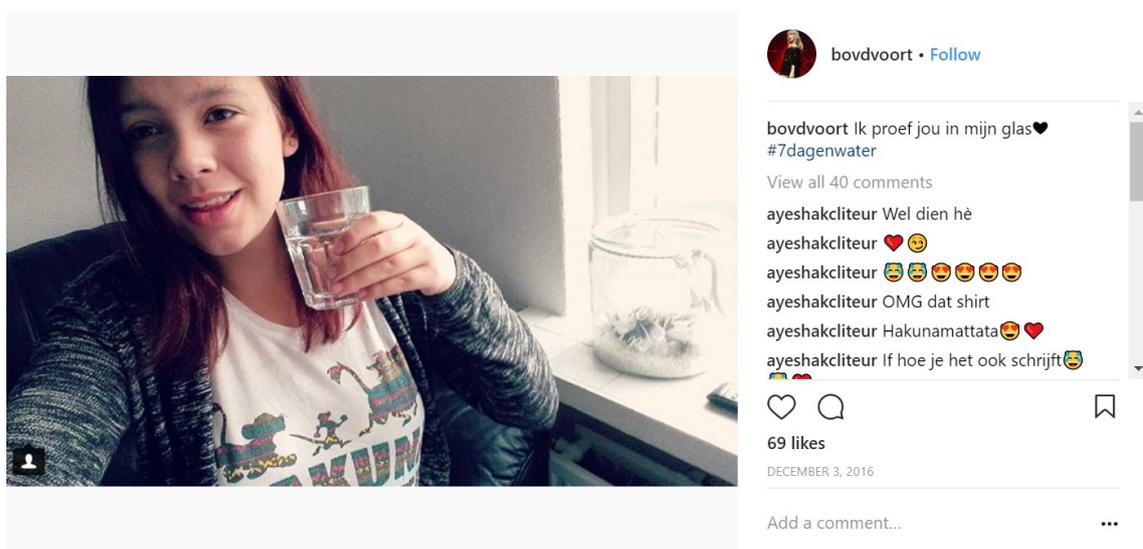
Picture DW2: Screenshot from Teske's *In Mijn Glas* music video

Retrieved from: <https://www.youtube.com/watch?v=R33o-V74-pY>



Picture DW3: One of the Instagram “tips” shared by JOGG – “Do not do the *7dayswater* challenge alone”

Retrieved from: <https://www.instagram.com/p/BTBM-pKIEWt/>



Picture DW4: An Instagram post shared by one of the girls participating in the challenge – “I taste you in my glass”

Retrieved from: <https://www.instagram.com/p/BNju9XqAYpT/>

Appendix no. 3: Hello Yoop in pictures (visual content)



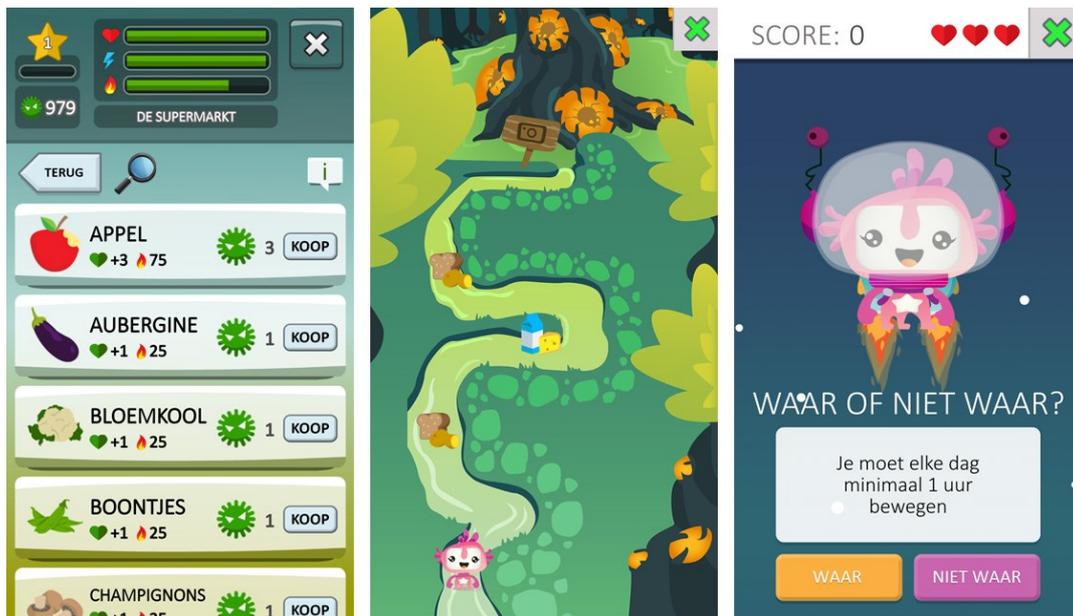
Picture HY1: Examples of pet customization in the Hello Yoop app

Retrieved from: <https://www.weberinteractive.nl/wp-content/uploads/2017/07/project-yoop1-1.jpg>



Picture HY2: Poster of the Hello Yoop launching event in Sonsbeek Park, Arnhem

Retrieved from: <https://facebook.com/yellowridersinternational>



Picture HY3: Examples of the Hello Yoop game mechanics

Retrieved from: <https://www.weberinteractive.nl/wp-content/uploads/2017/07/project-yoop3.jpg>

Appendix no. 4: Charge your brainzZz in pictures (visual content)



Picture CB1: Home screen of the Charge Your BrainzZz game

Retrieved from: http://www.grendel-games.com/wp-content/uploads/2017/07/CYB_splash.png



Picture CB2: Example of the Charge Your BrainzZz game mechanics

Retrieved from:

<https://play.google.com/store/apps/details?id=com.grendelgames.chargeyourbrainzzz>



Picture CB3: Screenshot of one of the introductory animated videos about healthy sleep

Retrieved from: <https://chargeyourbrainzzz.nl/>

Appendix no. 5: Interview with Peter Legters from KNVB

Below presented is the transcript of the interview with Peter Legters (PL), CSR Project Leader at the Dutch Football Association (KNVB). The researcher (R) interviewed Mr. Legters in a café in Utrecht Central Station on January 11, 2018.

The Speel je Fit campaign

R: What was your role within Speel je Fit?

PL: As the CSR project leader of Dutch Football Association, I was in charge of our part of the campaign.

R: The campaign was a part of a bigger initiative called A healthy heart your goal, is that right?

PL: Yes, the World Heart Federation partnered with UEFA to create this initiative, which was manifested in the Netherlands during the UEFA Women's EURO Championship 2017. And Speel je Fit was also partially connected to this tournament.

R: What were the reasons for targeting children from 8 to 12?

PL: There were many reasons for that. First, we wanted to target a small audience, just a small segment of youth, because youth is a very diverse group of people. This age group wasn't really meeting the national movement and exercise norms. Also, children in the Netherlands usually start with football at the age of around 7 or 8, so it made sense for us in this respect as well.

R: Did you choose the target audience before thinking about the theme, tactics and media channels of the campaign?

PL: Yes, we chose the age group and wanted to do something good for them. We already did some campaigns about healthy nutrition for this audience, that's why we decided to promote movement.

R: Did you use any research when designing the campaign?

PL: With the help of our partnering agency, we looked especially into the behaviour of our target audience. We found out that they were spending a lot of time on YouTube, while their older peers were more into Facebook and Instagram. So that's why we chose YouTube as our main channel. But our geographical segmentation was based on the Women's EURO tournament – we were advertising to children living in or around the seven host cities because children from these areas were most affected by the tournament.

R: Did you carry out any research on the children's habits and behaviour?

PL: One of the research insights that we used was that role-models are very important for this age group. However, the tone of voice and the type of videos we used were usually based on our experience and intuition.

R: Was there any secondary audience? The parents or teachers, for instance?

PL: No, not really. With the limited budget we had, we knew that we had to really focus on a specific age group. A sub-campaign targeting parents sounds nice, but that would only take part of our budget and energy.

R: What was the desired behaviour your campaign was promoting?

PL: We wanted to inspire children to increase the time they spent on exercising and playing outside, especially playing football, of course. I already mention the Dutch national exercise norm – we aimed to push children closer to meeting this norm.

R: And what were the communication goals?

PL: Since it was a CSR project of Dutch Football Association, the obvious goal was to contribute to the good brand image of the association. But first and foremost, we wanted to contribute to the tournament's goals – creating a positive atmosphere in the fan zones and spreading the spirit of football and healthy movement.

R: Was the campaign a short or long-term intervention? Was it a part of a bigger project?

PL: This specific campaign was just a short-term thing. However, the idea of getting children to be more active is still in our CSR policy, of course. We are now looking for other football-related solutions which could inspire children to exercise more after school, such as street football training sessions hosted by professional trainers, for example. But we don't plan to implement Speel je Fit again. Although we used some of the Speel je Fit elements such as the symbol of the ball and some of the football games in TV programme Totally Fit Kidz, which is co-sponsored by KNVB and the Dutch Heart Foundation.

R: What was your behaviour positioning strategy?

PL: We have this philosophy called "Like a Pro", so "Eat Like a Pro", "Exercise Like a Pro" and so on. That's why we showcased some popular Dutch football players as the role-models, teaching children quite difficult football exercises which they used to do when they were young. We wanted to challenge the children and inspire them to try and improve. Fun was also an important element, but the key here was individual effort and progress.

R: Did you use any particular social marketing scheme when designing the campaign?

PL: The initial idea was to create nine short videos about the nine exercises of our nine football ambassadors. The exercises were the central theme and could be regarded as the product of the campaign. Our partnering communication agency developed the rest of the campaign. We weren't really following any specific marketing methodology. In terms of communication, we were relying on the knowledge of the agency.

R: What led you to the decision to use YouTube as your primary communication channel?

PL: It was the advice of the agency. They researched the media habits of the target audience and found out that they spend one hour on YouTube every day, so we knew we had to be present on YouTube.

R: Apart from YouTube, what were the other communication channels?

PL: We had two approaches – online and offline. The core of the online part was YouTube, where we were posting our content and advertising as well. We also used the Totally fit kidz TV programme and were promoting the campaign on a variety of websites connected to the topic.

R: Did you use any calls-to-action in the campaign?

PL: We didn't ask the children to do anything online, such as sharing the videos, because it is not even legally allowed to ask children under 16 to do specific online tasks without their parents' supervision. Instead, we were encouraging them to go out and play football on the street with their friends or even by themselves.

R: So, didn't try to make use of the mobilising potential of social media?

PL: In our previous social media efforts, the engagement rates were pretty low. We didn't want to try creating something really cool and viral. Instead, we wanted to motivate them to start immediately with being more active.

R: What was the motivational mechanism of your campaign?

PL: It was the cognitive dissonance effect – we were making them try different football exercises, and they would realise that movement is actually more fun than other unhealthy behaviours. When creating behaviour change, you have to focus on activation. People usually already know what's good for them and what's not. The key is to make them really try the healthy activities. Our strategy was to get the children outside, to make them realise on their own that movement is fun. Then they would change their attitude naturally.

R: Did you have any specific evaluation plan? Were you happy with the results?

PL: The primary goal of the campaign was to make children more active, which is very difficult to measure, so we didn't include that in the evaluation plan. We were looking at the social media numbers, of course. We also did some exit interviews with children leaving the fan zones of the tournament, asking them if they liked it and why or why not etc. The evaluation was definitely a weak point of the campaign, and we are well aware of it. However, overall, we are happy with how the campaign turned out. Judging the success of the campaign by the number of video views was a paradox because we didn't really want to make children spend more time on YouTube, of course. We interacted directly with a couple of thousands of children when touring around schools with the exercises and distributed 1250 balls and around 120000 booklets with pictures of the national team and instructions for the exercises. I saw many children doing the exercises in person, and they really liked it. I think that's the most important thing – we saw that a few thousand children were enjoying playing football thanks to our campaign.

New technologies in healthy lifestyle interventions

R: Did you (or the communication agency) choose YouTube as the main communication channel because of its popularity among the target audience, or was the cost-effectiveness the main reason?

PL: It was definitely not about the budget. We asked the agency to find out what is the best way to address this target audience in order to make them more active. One of the offline options could be going to primary schools and promoting football in the classes, but that is again very difficult because of the law. Social media seemed like a place where they spend large amounts of time and we can reach them in there quite easily. Also, the popularity of the footballers featured in the campaign helped us reach an even wider audience without spending more funds on advertising.

R: If the target audience was a bit older, would you then make use of the interactivity opportunities social media create?

PL: I like the idea of the children shooting their own videos of themselves doing the exercises, but I don't think it would have much of an effect. It could be just a small feature of the campaign.

R: Looking back, would you do anything differently regarding the use of new media?

PL: Well, we're very happy with the work of the nine ambassadors, who participated for free, which is not really common among such famous people. But I think that we should have asked them more specifically to share some posts about the exercises on their social media profiles when the campaign started. We didn't really do that, and I think it could further increase the reach of the campaign.

R: Generally speaking, do you think that the social features of social media have potential for social marketing campaigns?

PL: Yes, absolutely. We're working now on a new pilot project, which is about exercising after school. And we really want to use a mobile app as part of this project. The children could compare their exercise results with their friends, children from other schools and professional athletes too. We're really interested in this competitive element now. I think it's important to offer the children something more than just the traditional football exercises and activities.

R: Do you think that the elements of gamification are effective even for a long-term intervention?

PL: We were thinking of an app which would allow you to collect points for healthy habits in your daily routine, but there's rather big competition on the fit apps market. I think we'd have to come up with something unique, perhaps using the comparison with famous Dutch footballers again – “run a sprint as fast as Arjen Robben!” Budget-wise, it would be difficult for us to develop such an app. We would have to work with external partners who could develop the technological part.

R: Would you say that this competitiveness is a specifically Dutch thing? In some countries, comparing your speed or stamina with professional athletes might be very discouraging for many people.

PL: Well, I think that you have to use the comparing function in a smart way. Give people the chance to compare themselves with their friends, but also with their own results from last week, for example. For every child, different motivational appeals work. Someone might start with comparing their results with last week, then move to comparing themselves with their peers, and finally to comparing themselves even with Arjen Robben. It's a process. I think further research is needed to understand which behavioural mechanisms work well, perhaps even for long-term interventions.

R: Would you say there is a difference in the potential of mobile apps for campaigns targeted at children and campaigns targeted at adults?

PL: It's very challenging to get people really active with an app. There's a big difference between downloading an app and active usage. When designing the Speel je Fit campaign, we asked the agency if we should use an app, and they told us definitely not. It would be too expensive for such a short intervention. I think that apps do have some potential for healthy lifestyle programmes, but you need to invest a lot of money in it and create something outstanding. You should either do it really, really well, or you shouldn't do it at all.

R: Do you recall any mobile apps or other examples of using new technology in healthy lifestyle promotion, either in the Netherlands or even abroad?

PL: Well, I do use some fitness apps myself, and I track my movement with a Fitbit bracelet. But I'm not really comparing myself with others. And I don't remember any good examples of mobile apps stimulating healthy lifestyle now.

R: Do you regard using social media in such a campaign as a good strategy budget-wise? Would you say that the use of YouTube in Speel je Fit was also cost-effective?

PL: Yes, definitely. But as I said before, that wasn't the primary reason for choosing YouTube.

R: Was the fact that all your Speel je Fit online content is now easily accessible to the public a big advantage?

PL: Of course, our secondary target was to show people what we are doing for the children. We could always tell our stakeholders to go see the YouTube channel, yes, that's a big benefit, of course. YouTube has a broad audience and allows you to share the content of your campaign organically, which is also what happened with our videos. Some people might have been just going through some other football or exercising videos and the platform took them to our content. That's a big advantage.

R: In general, is your organisation open to the use of new technologies in its interventions?

PL: Yes, we are looking at the possibilities, but we are also well aware of the downsides and we know that creating mobile apps, for instance, is very costly and challenging.

R: What is your opinion on using new technologies to provide people with an innovative learning experience as part of health interventions?

PL: In our experience, both children and adults already know what's healthy and what's not. Our goal is usually to trigger the target action, to motivate people to try the desired behaviour. Then they can change their attitude and long-term behaviour naturally.

R: What do you think about the paradox of providing children with more digital content when you actually want to make them go out and play?

PL: Well, that's why we wanted to approach the children offline as well. We were in contact with the children also in the fan zones of the tournament and in the schools that we went to with Speel je Fit. So, for us, the online content was just one of the parts of the campaign. The children should see the videos online, see the campaign in a fan zone, receive a leaflet about it in their school, and then they would hopefully try the exercises at home as well.

R: What do you think about using exergames as part of the campaign activation in fan zones?

PL: It would be a really nice, fun feature, which could work very well. But it can't be used for a big audience, that's the disadvantage.

Appendix no. 6: Interview with Ellis Koster from JOGG

Below presented is the transcript of the interview with Ellis Koster (EK), Marketing Advisor at Jongeren Op Gezond Gewicht. The researcher interviewed Ms. Koster in JOGG's central office in The Hague on January 16, 2018.

The #7dagenwater campaign

R: What was your role within #7dagenwater?

EK: I was in charge of the campaign team.

R: When exactly was this campaign implemented?

EK: The campaign was running for one week, starting on the 13th of November 2016.

R: Did you cooperate with any major commercial partners in this campaign?

EK: The most important private partner was Spa, a brand of bottled water. Their goal was to promote drinking water with the 12+ target group in general. Spa approached us with a partnership offer and then we were looking for an opportunity to use their funds in a campaign connected to drinking water.

R: Why did you decide to partner with Spa? Was campaign funding the main reason?

EK: The money was only one of the issues, but we mainly wanted to work with a private company because we believe that such partnerships are crucial for successful environment changes. If you want to succeed in behaviour change efforts, you need to cooperate with the government, municipalities, schools, producers and so on.

R: Why is the Spa brand not mentioned in the campaign? Is that your policy for private partnerships? Did you think it would be counterproductive?

EK: We didn't think it could hurt the campaign, but that is just our policy – there cannot be any brand exposure in our campaigns targeted at children and youth. We want to promote drinking water, not drinking Spa. Spa was of the opinion that as they are the market leader, they would ultimately benefit from young girls drinking more water as well. However, the sales were not Spa's primary motivation.

R: Was the #7dagenwater week-long campaign a part of a bigger, long-term initiative?

EK: Yes, it was, exactly. We created our Drink Water concept back in 2012.

R: What is Drink Water's target audience? Is it the same as the target audience of #7dagenwater?

EK: With Drink Water, the general campaign promoting drinking more water, we want to influence children and teenagers from 0 to 19. However, in practice, we saw that we mainly reached the target group from 0 to 12, especially through children daycare and primary schools. Our Drink Water efforts weren't very interesting for youth, for adolescents from 12 to 19. Therefore, we had to find another proposition for that segment.

R: Who came up with the idea of targeting girls from 12 to 15? Was it JOGG, or Spa?

EK: Our initial goal was to reach both boys and girls from 12 to 19. But then we realised that the differences between girls of 12 and boys of 19 are too significant for one campaign. Therefore, we wanted to choose a smaller segment to begin with, and we found out that girls from 12 to 15 were rather interested in drinking water and how it benefits their health and beauty. It seemed like a rather easy group to begin with.

R: Did you carry out any research to help you with segmentation and targeting?

EK: Yes, we used insights from another partner's research. Unfortunately, I cannot share the data with you, they didn't even want to share it with Spa. I can only tell you that the partner used focus groups of youth from 12 to 18 and the goal was to find out who could we reach best with such campaign.

R: What about geographical segmentation?

EK: JOGG's campaigns are usually decentralised and localised for different municipalities, but with #7dagenwater, we targeted the Netherlands as a whole.

R: Were there any other targeting specifics, for instance in terms of media habits of the girls?

EK: Not really. However, since we partnered with Dutch vlogger Teske, you could say that we focused especially on her fans and followers, and on girls who use YouTube in general.

R: Why did you decide to use social media as the primary channel in the campaign? Was that decision also research-based?

EK: Yes, our research found out that social media is the best way to reach this target audience, because we cannot really reach them through their parents and school anymore. They listen to important vloggers or models instead.

R: Did you also use research to look into the barriers to the desired behaviour? What makes girls drink soft drinks instead of water, for example?

EK: Yes, we also did research into girls' drinking habits, but I cannot share the data with anyone.

R: In an online interview, Spa's director said that the goal of the campaign was to tell young people in an appealing way that drinking water is tasty, healthy and fun. Would you agree that this was your communication goal?

EK: Yes, especially "fun" was one of the most important aspects. We found out that teenagers often consider drinking water as something boring, and we decided to change this. And, for example, Spa emphasises variety – they offer many different variations of different taste.

R: Was there a secondary target audience? Did you want to reach boys as well? Or the girls' parents?

EK: No, not really. We are looking forward to creating a campaign for boys as well, but that one will have to be completely different. Especially the music video was very girly.

R: The campaign lasted only seven days. Were there any follow-up communication efforts after this one week?

EK: Yes, we worked with the theme of “seven days drinking water” for another two weeks with two catering companies, which were promoted drinking water at high schools. Additionally, we offered the concept to the JOGG municipalities to adopt it and implement it with regional vloggers and influencers again.

R: What was the main positioning idea? How were you trying to present drinking water when compared to other, competitive behaviours?

EK: As I said before, presenting drinking water as “fun” was definitely an important aspect. However, I would say that the main positioning idea was that drinking water is a normal choice, something that you usually drink.

R: Were you also trying to promote the healthiness of water?

EK: No, not really. Although for girls, beauty is a very good insight. They care about their appearance, of course. That’s why we were also communicating that drinking water is very good for your skin. Nevertheless, health was not the primary issue here. Our research suggested that girls don’t want to be told that water is healthy, they already know that and are tired of hearing that over and over again.

R: On Instagram, you were sharing some “water tips” as part of the campaign. What were there about? Did you try to communicate any factual information, rational arguments about the benefits of drinking water?

EK: Those were just general tips such as “Do you also drink water after sports?” or “Do you put fruits in your water?”, we didn’t use any factual information about the benefits of water.

R: Do you use the same behaviour positioning strategy when promoting other behaviours, such as exercising more often or eating healthier foods?

EK: Well, we always use images of happy children, that is true. However, for example with eating vegetables, we focus more on the “normality” again – “everybody does it, it’s the logical thing to do” – even though in reality only 1% of Dutch children and youth consume the recommended amount of vegetables.

R: Let’s talk about the campaign creation process now. Did you design the campaign according to social marketing methodology, or was it more of an intuitive process?

EK: We came up with the idea and then our communication agency created the campaign. Through this agency, we also had the opportunity to partner with some vloggers. From all the vloggers who were interested in our project, Teske was the best fit for us. Later on, she came up with the idea of writing a song about drinking water, and that is how we created the main media product of the campaign – her music video.

R: Why was Teske such a good fit for your campaign?

EK: She was very popular with the target audience and she was also very interested in healthy lifestyle and had a history of vlogs on it. It was a perfect match. Some of the other vloggers were working with candy brands as well; the message wouldn’t be very authentic or believable if conveyed by them.

R: Did you use any other channels apart from social media?

EK: No, we didn't, this campaign was purely social media-based. The research suggested that for our target audience, social media would be most effective.

R: Were there any interactive elements in the campaign?

EK: We asked the girls to post pictures of themselves with water on Instagram. Authors of the most interesting pictures won a meeting with Teske, the vlogger.

R: How did you create content for the campaign's Snapchat profile?

EK: Teske wanted to do that by herself, so that was completely her responsibility. Our communication agency created some content for the #7dagenwater Instagram profile, but Teske was sharing her own content as well on YouTube and Instagram, with her own messages.

R: Did you think about the mobilisation potential of social media when choosing the channels for your campaign?

EK: That was just a secondary benefit suitable for our "challenge" theme. The main reason why we chose social media was simple – that's the place where young girls spend time, that's what they do.

R: Did you use a call-to-action in your social media communication?

EK: The only call-to-action was encouraging girls to participate in the challenge, drink only water for one week and share some nice pictures with us on Instagram. We didn't use any links to our website, nothing like that.

R: Were you satisfied with the results of the campaign and with the use of social media as the only communication channel?

EK: Yes, definitely, the same goes for Spa. Our evaluation plan consisted mainly of engagement numbers on social media, and those were all exceeded. Initially, we were also planning on finding out how the attitudes and behaviour of the girls we had reached changed, but our partners advised us to focus solely on social media measures.

R: Would you say that the use of social media in your campaign was cost-effective? Was it the right choice budget-wise?

EK: Yes, we were quite happy with the cost-effectiveness. We had to pay Teske, the vlogger, of course, that was a big part of the budget. But we didn't spend much money on advertising and the girls we targeted were still reacting to our campaign.

R: Will there be any follow-up campaigns with the same theme in the near future?

EK: We're currently planning a similar campaign for the same age group featuring famous Dutch women, especially sportswomen. But that's quite difficult because they usually have sponsorship contracts with other brands and companies.

R: Any plans for reaching other target audiences?

EK: We're dreaming of creating a campaign for boys, but with our limited budget, we decided to focus on young girls for the time being. But in the long-term, we'll be definitely targeting

other segments as well. Also, we really enjoy cooperating with Spa, and we've recently renewed our contract for three more years.

New technologies in healthy lifestyle interventions

R: Do you consider YouTube just a convenient and cost-effective communication channel, or do you also see other benefits in it?

EK: The main advantage is that you can get quite close to the target audience in their own world, in their natural environment. But on the other hand, it is difficult to use social media in campaigns that are promoting going out, leaving mobiles and computers behind and exercising. For our exercising promotion, we created a map of the Netherlands where children can easily find a place nearby to exercise, but you can't do much more.

R: Do you think that new technologies bring new opportunities to the learning experience?

EK: Yes, I believe that new technologies can make the learning experience more attractive. But this attractivity can be just momentary – we can see that on the example of Pokémon Go, which was a huge hit, but only for a couple of weeks for most people. It's difficult to keep the attention of children and youth in the long-term.

R: Does gamification with all its aspects such as the social factor, competitiveness, or motivation through collecting points and achievements, have the potential to motivate children in the long run?

EK: I think we don't know yet. At the moment, I am not convinced that it works in the long run. I believe that more research is needed to see if there is a potential for successful long-term interventions as well.

R: What do you think about tracking devices and apps for children?

EK: I remember a big pilot project created by UNICEF which was using a step counter, and I believe that worked well. So, yes, I think that such technologies can work as a great motivational element. However, we have to keep in mind that we also want to reach children who might find movement and exercise difficult, and the competitive element might discourage them from participating. The use of new technologies should always be socially inclusive.

R: Would you say that there is a maximum amount of media content health interventions should use? After all, the ultimate goal is often to draw children's attention to something other than their smartphones and computers.

EK: There has to be a balance, of course. But the thing is that they are really willing to spend a lot of time on social media, for example. The role of parents is very important here, they should set up a clear set of rules for the use of new technologies with their children. We will be running a campaign about this soon.

R: What do you think about exergames and their potential for such interventions?

EK: I don't know enough about that, so I don't really have an opinion.

R: In the long-term perspective, do you plan on developing a mobile app as part of one of your interventions?

EK: Well, we won't do it ourselves because of the limited budget. But there are some pilot projects of mobile apps promoting health in children, and if they turn out to be working well, we can support their spread around the Netherlands through JOGG's municipalities.

R: Have you noticed a health campaign using new technologies recently?

EK: In the Netherlands, I am inspired by the Healthy Sisters. They are really into running and are inspiring other women to run and exercise as well with the use of Instagram, in a very appealing way! I believe that something similar could work well for children and youth too.

R: What are the main advantages and disadvantages of using new technologies in healthy lifestyle interventions?

EK: It's cost-effective and you can reach your audience 24 hours a day whenever you like. But there is also the difficult challenge of persuading them to leave their phones behind with content shared on their phones. There's a paradox in this, that's for sure.

R: In general, is your organization open to the use of new technologies in its interventions?

EK: Yes, definitely. But it has to happen in cooperation with partners and in a smart way.

Appendix no. 7: Interview with Stephan Aarts from Yellow Riders

Below presented is the transcript of the interview with Stephan Aarts (SA), Founder and Director of the Yellow Riders company. The researcher (R) interviewed Mr. Aarts in the Dutch Game Garden in Utrecht on January 24, 2018.

The Hello Yoop app

R: What was your role within the Hello Yoop project?

SA: I was in charge of the Hello Yoop team. Rijnstate Hospital in Aarnhem asked me to develop a game for their patients - kids with overweight and obesity, but also for children who live in the city of Aarnhem as a prevention tool.

R: What was the hospital's motivation to develop a digital solution to treating obesity?

SA: Initially, they created a six-months-long programme for which children can sign up or be signed up by their parents. However, during the pilot period, they found out that this programme would be very costly for them, because it consumes a lot of time of many different specialists. That's why they asked us to come up with a digital product which would help them to stay in touch with the kids all the time without being with them in person.

R: Can you briefly describe the development process?

SA: We invited ten Dutch game studios for a two days-long challenge. All of the studios made a pitch, and the draft that we liked the most was this Tamagotchi-like game. The winning studio was then responsible for programming the game in cooperation with us, Yellow Riders.

R: When exactly was the game released?

SA: Six months ago, in July 2017.

R: Why did you choose the age group from 12 to 16 as the target audience?

SA: We had a discussion about this with the hospital. Kids from 12 to 16 are still at primary or secondary school, and before they go to high school, we want them to adopt a healthier lifestyle.

R: Is Hello Yoop just a treatment tool, or is it also a prevention tool?

SA: When we were developing the game, it was supposed to be just a treatment tool. But now we removed the medical part, and the game is available to anyone. It's still a programme for six months, but everybody can use it now without being a patient of the hospital. The target audience of the prevention app is now 8+ in all of the Netherlands.

R: Was there any secondary audience? The parents, for instance?

SA: We found out that mothers of the children often use the app as well and they are happy that something else is now motivating their children to eat better and move more. Sometimes parents follow the instructions of the app along with the child and they can get in better shape too.

R: Did you do any research into the behaviour of the target group?

SA: Yes, we partnered with Roel Hermans, a behaviour scientist at Radboud University, whose specialisation is in health and food. We found out that the biggest problem is the environment. When comes to kids with overweight and obesity, their families are usually the main cause, because they themselves eat poorly and don't exercise at all.

R: What was the desired behaviour change?

SA: It's a combination of moving a lot (8 or 10 thousand steps per day), knowing what you eat, drinking a lot of water and resting well. Children have many distractions in their lives – computers, TVs, mobile phones – so we also focused on implementing instructions for resting well, meditation and so on.

R: Could you briefly explain how the app works?

SA: It's a very straightforward game. There's a Tamagotchi named Yoop, and you need to keep him happy. That can be done by tracking your steps and recording what you're eating. With meditation, for example, you are also asked to breathe deeply on the screen, and the app will tell you if you're doing it well. Initially, we were testing the three parts separately – moving, eating and resting. Later on, we bounded them together and integrated them in the Hello Yoop app.

R: What happens after the six months of the programme?

SA: You don't get the incentives and presents anymore, but you can use the monitoring features. According to our data, children still use the app to check whether they are doing well or not and to learn a bit more.

R: What was your behaviour positioning strategy?

SA: In the first version of the app, there were many mini-games implemented. However, we found out that those were in fact just distracting children from moving and eating well. So, we reduced that. The fun part is still important though – we will be testing more mini-games which shouldn't be very distracting. Children can adjust and personalise their Yoop. Also, after each day, the app tells you if you met the goals or not. You will be awarded with a special sticker after each successful day. And if you complete a full month, you'll get a wristband. The kids can thus compare themselves with their classmates and friends. The social element is also important. And the incentives – exchanging points for discounts for going to the ZOO with their family, for instance.

R: Watching movies or playing video-games can be fun too, so why should children use your app instead of doing these things?

SA: Well, they can still be watching movies or playing games. The goal of the app is to add something to the children's lives, not to take something away necessarily. The activities that we require them don't take much time actually.

R: Did you create the game with any particular social marketing or behaviour change theory in mind, or was it more based on your intuition and experience?

SA: Both, actually. There were doctors and scientists involved – obesity paediatrician Saskia Bouma from Vrije Universiteit Amsterdam and Slotervaart Ziekenhuis, lifestyle coach Marjolein Postma, and Roel Hermans, the behaviour scientist I already mentioned. We had a lot of tests and were discussing details with these experts, many of which then got removed or added. But we also used our own experience with developing games, of course.

R: How were you trying to promote the game?

SA: In the initial phase, the app was functioning only as a treatment tool for chosen patients. But when we redesigned the app to serve as a prevention tool for everyone, we worked with vloggers, who were promoting the game on their social media channels by actually playing it. In some cities, we were organising special promotional events. For example, in Aarnhem, there's a really nice large park in there, so we created a route and the children were running around the park and completing different tasks. In the next few months, we're planning on promoting the app much more around the whole Netherlands. We're also cooperating with some schools and hospitals to promote the app.

R: Why did you choose vloggers?

SA: We partnered with a PR agency asked them to come up with something tested and reliable. This also took a long time and at the end of their work, their advice was to use vloggers as the main online communication strategy.

R: Doesn't the game have just too many different features? Wouldn't it be more effective to focus just on one of the elements?

SA: Initially, we had a lot of mini-games in the app. We've removed a lot already. The number of different features shouldn't be a problem now.

R: Would you change anything about the game?

SA: Absolutely. It is an ongoing process, actually. For instance, we know want to allow children to enter their food records with voice to make this feature easier.

R: Are there any e-learning elements in the game, which provide children with some factual information about healthy lifestyle?

SA: In the first three weeks, you learn a lot – what’s good and what’s bad for your health. After that, you start using the app in your daily life. Eventually, they change their thinking from “I need to do this for Yoop” to “I need to do this for myself”.

R: On the website, you describe the app as an intervention which is constantly with the children. Is that the main motivational mechanism?

SA: The incentives, reaching new levels and earning presents are most important for keeping the children motivated for a long period. But the game itself was created mainly to be fun to play. There are also some reminding elements implemented, which should keep the children interested. But the main motivational mechanism is probably that we want to make the children feel healthy – that should help them motivate themselves to adopt healthy lifestyle.

R: Do you have any plans for the future with the app?

SA: We definitely want to expand to other Dutch cities as well, but our primary focus now in terms of development is personalisation. We want the app to reflect the preferences of the child. With data analysis and automatic personalisation, the app should be even more effective.

R: Social marketing interventions are sometimes criticized by the public for not bringing any quantifiable results. Did you use the data you collect with the app to communicate the whole project to the public?

SA: No, we use the data only for improving the app. And the children can see their own results, of course.

R: How did you finance the development of the app?

SA: The hospital in Aarnhem and the province of Gelderland provided the finances together, and my own company Yellow Riders invested in it as well. We are now looking for more partners who would help us expand the game to other cities in the Netherlands.

R: Would you say that the strategy of developing a mobile game for this purpose was feasible and cost-effective?

SA: Developing such an app is costly, it’s a long process. But I believe that this mobile game is the best tool for healthy lifestyle promotion at least among some children.

New technologies in healthy lifestyle interventions

R: This is a quote from Yellow Rider’s website about Hello Yoop: “The connection between gaming and obesity is often seen as relationship of cause and effect – games as one of the possible causes of obesity. This time, it is the other way around.” Would you say that gamification really carries a lot of potential for healthy lifestyle promotion in children and youth?

SA: Yes, not only in children but also in elderly people, who play a lot of games as well. We are trying to find a way to make therapy more fun. Games can really make a difference in that respect.

R: How do you make sure that children won't stop using your app in the long run?

SA: The most important thing is to have children involved in the constant development process. We're having children designing their own mini-games for the app, for example. Additionally, we're working with some high school children who are closer to the target group, and they help us continually update and improve the app.

R: How important are the incentives in such apps?

SA: For some children, they are very important. But I think that it's the combination of everything that makes it work well.

R: Where do you think is the right balance between media use and physical activity? What I mean is that your app requires the children to use their smartphones even though it promotes going out and exercising.

SA: Overweight and obesity are very complex problems. Sometimes it's in your genes, sometimes it's psychological, sometimes your family is the cause. You cannot really say: "The TV is the main cause." Nevertheless, to answer your question: The time children are asked to spend using the app is always limited to just a few minutes each day.

R: What do you think should be the role of adults in such interventions targeted at youth?

SA: With adults, the problem is that they often don't have any spare time for themselves. That's why we were trying to make them spend more time with the children through our app, thinking about healthy food or exercising together.

R: Is the tracking and reminding feature important?

SA: Right now, it is actually turned off in our app. The reminders were static, 8.00 for breakfast, 12.30 for lunch etc. We want to personalise the reminders for every child. That would be much more effective, I think. The app needs to be reacting to what happens in the day of the child.

R: Have you ever considered using social media as the central platform of one of your healthy lifestyle interventions?

SA: Well, with Hello Yoop, the target group is 8+, while Facebook is 13+. Instagram is a good thing to use, but not so popular with younger children at the moment. We wanted to create support groups for children on Facebook for example, but there was a problem with data security.

R: Can the social factor – comparing yourself with others, sharing your achievements - function as a motivational element?

SA: For most of the kids, yes. For some kids, no. We made this app for everyone. However, if we find out in our data that there is a kid who is probably obese, we can send them or their teacher or parents a message and treat them differently, with the help of a lifestyle coach or a doctor, for example. For obese children, the competitive element could be discouraging.

R: What do you think about exergames and their potential for healthy lifestyle promotion?

SA: It depends on what you're looking for. The problem with exergames is their availability. It's rather difficult to get to them; you'd have to buy them, you know. We're looking for something that is with you all the time – your mobile phone.

R: Have you gotten inspired by any other digital health intervention?

SA: For instance, we used the GPS-based routing technology, which was partially inspired by Pokémon Go and similar apps.

R: In your opinion, are new technologies the way to go when designing healthy lifestyle interventions these days?

SA: Previously, everything was solved with pills and visits to the doctor. Now, people are trying to avoid going to hospitals. There's a lot of evidence available from universities about the effectiveness of digital health interventions, but people don't really know about it yet. Our goal is to bring this experiential knowledge out in the streets in a very simple, fun way.

R: Are you currently working on some other health-related games?

SA: Yes, we have different game concepts we're working on. Right now, we are testing a game which should help treat patients with brain injury. Another game is trying to make heart-related exercising more fun. But there are many of them, really.

Appendix no. 8: Interview with Koko Beers from the Brain Foundation

Below presented is the transcript of the interview with Koko Beers (KB), Project Leader at The Brain Foundation (Hersenstichting). The researcher (R) interviewed Ms. Beers in the Brain Foundation office in The Hague on January 24, 2018.

The Charge Your BrainzZz learning package

R: What was your role within the Charge your brainzZz project?

KB: The Brain Foundation is a health fund – we raise money for research and projects with the goal to prevent and cure brain diseases. I focus mainly on the prevention part, which is partially oriented towards children and youth, who are still in physical development and experience many brain-related changes. As part of our educational prevention efforts, we funded the Charge your brainzZz project and I was the project leader. The contents of the learning package were created by Chrono@work, a company connected to the University of Groningen. The game app was developed by Grendel Games.

R: When exactly was the project launched? Do you already have some results?

KB: On September 27, 2017. Since then, the package has been downloaded more than 300 times. In March, we are going to start an evaluation study conducted by the Vrije Universiteit

Amsterdam together with the Public Health Service of Amsterdam. The researchers will test the quality of sleep and sleeping habits of children in schools before and after the intervention.

R: The game was a part of the learning package. Can you play the game even when your teacher does not apply the package in their classes?

KB: Yes, the game is accessible to the public as well, but only the first level. For the other levels with more features, you need a code, which is provided after downloading the whole package. But the game is usable even without the code.

R: Why did you choose the age group from 12 to 15 as the target audience?

KB: The youngest of this group have their second year of biology in school. We were targeting children who currently have their second or third year of biology classes. Chrono@work did a research with teachers, children and their parents, and found out that the best way to convey our message to children would be incorporating it in biology classes. And the curriculum of the second and third year of biology classes was best matching our intentions. Also, this age group has already entered puberty, but you can still reach them. Contrarily, their older schoolmates wouldn't listen to you.

R: Who did you target in terms of geographic segmentation?

KB: All schools in the Netherlands can use our learning package, so the intervention is nationwide. The project initiated in Groningen because of the contacts of Chrono@work in that city. But since then, many schools from different parts of the Netherlands have adopted it as well.

R: Was there any secondary audience? The parents, for instance?

KB: Yes, parents were included in the learning process. For instance, as part of the homework, children were supposed to discuss their sleeping habits with their parents, who were, of course, their role models and had an influence on the children. Also, we included a section for parents on the website so that they could find information about healthy sleep as well. It's always nice to influence more than just one audience segment with the intervention. And we hope that the teachers were influenced by the learning packages as well when using them in class.

R: Did you carry out any research into the behaviours of the target audience? Did you try to understand what are the main barriers to healthy sleep for this group?

KB: We didn't do our own research on this, but we extracted some insights from the literature. One of these insights was that children were indeed spending a great part of their evenings and even nights with their mobiles and computers, so we knew that was something which needed to be addressed in the learning package.

R: What was the desired behaviour change? And what were the communication goals?

KB: The ultimate goal was to motivate children to adopt healthy sleep habits. We wanted to make children realise the importance of quality sleep as well as both the short and long-term negative consequences of poor sleeping behaviour.

R: What was your promotion strategy? Did you try to promote the game also to the public?

KB: At this point, we're still focused solely on schools. We created a launch event and used social media advertisements, newsletters and some public relations tactics to target teachers. Also, we've been in contact with a biology professionals society and we're planning on visiting their conferences and promote the package there in person. After being lured to the website, the teachers should then download the whole package and incorporate it in their biology classes.

R: Is Charge your brainZz a short-term intervention?

KB: Well, the information we provide in this project is applicable throughout the whole lifetime. We hope that the project can establish a solid foundation for their future sleep as well. Some of the children will not change their behaviour now but can change it when they are a bit older. However, regarding the intervention's actual length, it consisted of three 45 minutes-long classes only.

R: What was your behaviour positioning strategy?

KB: No, we wanted to make the learning process fun, but the desired behaviour itself was not communicated as fun.

R: Did you try to associate fun with healthy sleep?

KB: We tried to present all the positives connected to quality sleep. We were communicating that if you sleep well, you feel better, have better results in school, and also look better. Then we wanted to show children that sleeping well is in fact quite easy – make sure you don't exercise or drink caffeine late and turn off your electronic devices early in the evening.

R: Did you create the intervention with any particular social marketing or behaviour change theory in mind, or was it more based on your intuition and experience?

KB: I think that the Chrono@work's part could be called social marketing, but I don't know if they designed the contents of the learning package according to a specific methodology. It was probably more based on our experience with similar campaigns and also on the initial research with children, teachers and parents.

R: You told me that the website as a promotional channel was targeting teachers who could potentially use the package in their classes. However, judging by the design, the primary target audience is children again. So, who was the website for?

KB: Well, yes, that was one of the struggles we had. The website was offering the package to teachers, but at the same time it provided a sleep encyclopedia for children and parents. The evaluation study I mentioned will reveal if using this one website for all the different objectives and audiences was a good strategy or not. In my opinion, it was a bit too much for one platform.

R: Why did you decide to create a learning package in the first place instead of some other intervention strategy?

KB: That's a good question. To be honest, I don't really know the answer because I wasn't here yet when the initial idea was created. One of our partnering agencies is conducting research for

us which should reveal the most effective ways of reaching children and youth with our campaigns, so I believe that such decisions will be more based on research evidence in the future.

R: What was the role of the online game within the learning package?

KB: The initial research indicated that both children and teachers would welcome some sort of game in the learning package. Therefore, we created this game as part of the homework. It's a serious game, of course, so it still presents some information and knowledge to the children. However, it's main purpose is to enhance children's engagement and interest in the intervention as a whole. The game is a nice element to have in the intervention, but it wouldn't create a change in behaviours on its own, it needs some context and information. Regarding the game's design, it offers only three levels which can be completed quite easily, but it can be used afterwards as well, there are no limitations. It can help some of the children to sustain the healthy sleep habits. Also, I would like to mention one of the game's feature – after 8pm, children can't obtain any points anymore, so they are not tempted to play the game during nights. That would of course have the opposite effect to what we wanted.

R: Could you briefly describe the game? Was the game's story important?

KB: It's a mobile game available for all Dutch users on App Store and Google Play. There is a wizard called Sandman who's been helping people sleep for a very long time but now he wants to retire. You, the player, are in the role of his student and successor and have to bring him objects associated with healthy sleep in the first level. The next to levels are more complicated; there are features such as blue light, which is good for the player during the day but causes them damage during the evening, or energy drinks, which can't be used too often if you don't want to collapse. I don't think the story was very important, children want to play the games, they don't care too much about the background story and all.

R: What was the main motivational mechanism of the intervention?

KB: We included a variety of teaching methods in the learning package, such as card games, discussion exercises and animated introductory videos. The videos were also asked for by teachers and students in the initial research. A lot of interactive elements were implemented. And the mobile game was added as a fun, engaging bonus for the homework.

R: Did you include any incentives connected with the game? Any comparison with their classmates, for instance?

KB: There is a leaderboard on the website where children can easily compare their results with their classmates and children from other schools as well. Also, as a motivation, we announced that the owner of the best score would win a trip to a museum with their class. I think we will be improving the incentives in the future; the system is not well thought-through at the moment.

R: Do you have plans of creating some follow-up activities to this intervention?

KB: We've just started creating our organization's plan for the next five years, so I don't have the answer to this question yet. We want to focus more on healthy sleep, but I don't think that we will be targeting small children as the primary target audience again.

R: Did you create a specific evaluation plan for this intervention?

KB: Initially, we wanted to set up some quantitative goals such as the number of schools involved after the first year. But now we are just happy with the qualitative results – the feedback from

schools has been positive, children, teachers and parents are all happy with the package, it really seems to be working well. And as I already said before, a complex evaluative research including sleeping diaries will soon be conducted by our partnering universities. I would say that we are still in the pilot phase of the intervention.

R: Would you say that the strategy of developing a mobile game was appropriate to the objectives and budget of your intervention?

KB: Well, it was costly, but it makes the whole package more interesting and attractive. But I really can't tell if the game was cost-effective and if the benefits outweigh the investment we made.

New technologies in healthy lifestyle interventions

R: What do you think about the potential of new technologies in healthy lifestyle campaigns?

KB: I can see the potential, but I can also understand the concerns of some people regarding children's use of new technologies. I think that new technologies such as mobile phones put a lot of pressure even on very young children and on people in general. In that sense, I believe that they contribute to mental health problems and perhaps some physical problems as well – the kids in my family often just play with their phones and don't play outside anymore. But the thing is that we already have these technologies and they will surely stay with us. So, I believe we should try to use them for good. However, I think that there are just too many health-related apps right now and there's a lack of attention to how they are financed, designed, implemented and evaluated. The objective of The Brain Foundation and other organizations as well should be to do research into this and reveal which new technologies can really benefit to health promotion.

R: Where is the right balance between new media use and the desired behaviour?

KB: I don't think there is enough supportive evidence to the negative effects of new technologies on mental well-being. We didn't try to prevent children from playing our game all afternoon, but we at least created the controlling element which turned off gaining points after 8pm. To be honest, we are still not sure if it really is a good idea to encourage children to spend more time on their phones playing a game as part of an intervention which promotes healthier sleep. But I think they would be playing games on their phones anyway if it wasn't for our game.

R: Do you see gamification as a strategy with large motivational potential among children? Could it be the decisive push towards the desired behaviour?

KB: Yes, I think it works very well not only with children, but with people in general. People always have the urge to win and to get some kind of reward for their activity. But I'm not sure if gamification can ensure a long-term behaviour change. We're very interested in these issues, but we don't have the answers unfortunately.

R: Generally speaking, do you think that the social features of social media have a potential for social marketing campaigns?

KB: We thought about using social media as well in this intervention. I would really love to use social media in our interventions, especially when targeting children and youth. But our organization doesn't have the capacity to keep up with the all the advancements in the field of social media. We're currently doing research on what children and youth are interested in and

which communication channels are most effective with them. I would be highly surprised if social media and vloggers, for example, weren't mentioned among the best strategies.

R: Have you gotten inspired by any other digital health intervention?

KB: There are many commercial health-related apps for tracking your physical activity and nutrition. What I find interesting is a Dutch project of a health-related app store which aims to guide users in the world of health apps, test them and recommend the good ones. But apparently, they have no idea of how to reach people because I haven't met anyone who would know about them yet.

R: What are the barriers that digital healthy lifestyle interventions must face?

KB: I think the major problem is the huge number of health-related apps and the speed at which the whole field moves forward. Because of this very fast advancement, the truly quality, fully research-based apps and other digital interventions never make it to the big public. This kind of intervention development takes a lot of time, and by the time it is done, the intervention doesn't fully fit the current technologies anymore. Also, designers of such research-based interventions often don't think through the financing, distribution and promotion – who will pay for the app, how it will be distributed to the users, how it will be promoted.

R: In your opinion, what is the best practice of using new technologies in healthy lifestyle interventions? What are the main benefits and limitations? What are the rules that need to be followed?

KB: The key is to incorporate your target audience into the development process. The intervention shouldn't be based on the assumptions of the creators, especially when designing an intervention for children. Also, the finance and distribution parts should be very well thought-through.

R: What do you think about the cost-effectiveness of using new technologies?

KB: We already talked about the expensiveness of such interventions. That's why more cooperation is needed in the field. As a health fund, we really need many good partners to be able to finance such a project and reach a wide audience with it. Also, I will repeat myself now, but it really is crucial to keep the end user in mind when developing the intervention, otherwise it can't be successful and effective at all.

R: Are you currently working on some other digital health interventions?

KB: When I joined this organization, there were plans of developing a digital healthy lifestyle tool for the 50+ years old audience. But there were no specific ideas for this project. I said that we had to cooperate with other partners as well and find fresh ideas for the intervention. That's why I will be organising a hackathon-like event where teams of students from health-related programmes will be encouraged to cooperate with our partnering researchers and insurance companies and come up with innovative concepts for our project. And we will also invite some members of the target audience to test the ideas with them. I believe that this approach could really bring us some new interesting ideas.