MEMEotive - Analysing the Effects of Internet Memes on Young Teenagers' Health and Health Behaviours

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1. Executive Summary

- There is growing concern over the significant costs of unhealthy lifestyles to the NHS;
- This concern is exacerbated by growing evidence of young teenagers' poor health and unhealthy lifestyles;
- UK youngsters are lagging behind their European counterparts in many areas (WHO, 2017). For instance, nearly a third of children in England are overweight or obese (Health and Social Care Information Centre, 2015), compared to less than a fifth across other European countries (WHO, 2017).
- Given the increasing significance of, and reliance on, online sources of health information it is important to understand the Effects of Internet Memes on Young Teenagers' Health and Health Behaviours;
- There is evidence of uncritical consumption of on-line health-related information by teenagers and a lack of regulation and quality control in relation to on-line health information.
- This highlights the critical significance of social media to young teenagers' development and their wellbeing;
- There is a need to be aware of the over optimism of young teenagers with regard to their own online vulnerability
- Our provisional inquiries show that a substantial number of individuals on Twitter share health related Internet memes, with both positive and negative messages, through their public accounts. Such is the pervasiveness of Internet memes that the vast majority of sharers display little, if any, emotion when sharing these memes: many of which contain inappropriate material or ridicule others by race, gender, ethnicity, sexuality, body shape, religion, diet etc. When viewed in this way, Internet memes have the potential to normalise undesirable behaviours such as trolling, body shaming and bullying, and a lack of emotion may be indicative of a larger apathy with regards to such practice.

2. Introduction

1. About us

   a. Dr Ash Casey has a strong publication record in education and social media/technology. His exploration of the role of Internet memes in shaping teenagers' health-related social media interactions led to this work. He has 15 years secondary school teaching and 8 years teacher-education experience.

   b. Dr Martin Sykora has a strong publishing and funding track record in computational sentiment analysis, with applications in health and well-being. He is Loughborough's PI on the EU Horizon2020 NESTORE project, which explores computational big-data solutions and technologies for older people to retain everyday life activities and healthy behavioural decision making.

   c. Dr Suzanne Elayan works in semantic modelling and designed and built the EMOTIVE ontology and other semantic models. She has a successful track record in ontology-building and design for social media monitoring.

   d. Professor Tom Jackson led the EMOTIVE team and since then he, Martin Sykora and Suzanne Elayan have worked as a team on a series of successful projects. He has 15 years' experience of research and industrial consultancy and has been part of securing over £14.3M from Research Councils.

   e. Professor Lorraine Cale has published widely and secured a number of research grants in the area of health. More recently she has written in the areas of social media, young people and health and social media. She is engaged with policy makers and key stakeholders in various capacities, e.g. she regularly chairs Westminster Policy Briefing events on relevant national policy developments.

2. Loughborough University is ranked number one in the QS world university rankings for sport-related subjects (2017 and 2018). In addition, the university has a very strong international profile in emotion and linguistic based research and computer system development. These factors combined mean we are strongly placed to submit evidence to the House of Commons Science and Technology Committee's current inquiry on 'The Impact of Social Media and Screens on Young People's Mental Health'.

3. Evidence

3. Unhealthy lifestyles cost the NHS billions every year: smoking reportedly costs over £5 billion, obesity £4 billion, alcohol £3.5 billion and physical inactivity £1.1 billion (Kings Fund, 2017). These figures are significant given growing concerns over young teenagers' health. The prevalence of online health information and the dangers of inaccurate/inappropriate health messages – coupled with the fact that searches for health information online have far outpaced searches via other media sources – mean it is imperative that we study the sources of online health-

related knowledge that young teenagers access. With 13-16 year olds increasingly seeking to address their own health concerns (Wartella et al. 2015) MEMEotive will enable us to understand how and why unhealthy behaviour can become normalised. Investing in and putting young teenagers at the centre of this work is key to understanding how Internet-memes contribute to the normalisation of unhealthy lifestyles. At the heart of MEMEotive is the drive to influence the decisions of policymakers and other stakeholders (e.g. schools) when it comes to supporting young people to be healthy.

4. Most recent findings from the Health Behaviour in School-aged Children World Health Organisation Collaborative Cross-National survey reveal worrying patterns and trends concerning teenagers' health and health behaviours (including high obesity levels, low physical activity and poor eating behaviours), with UK youngsters lagging behind their European counterparts in many areas (World Health Organization (WHO), 2016). For instance, nearly a third of children in England are overweight or obese (Health and Social Care Information Centre, 2015), compared to less than a fifth across other European countries (WHO, 2016). Given that health habits and many health problems are established early in life, the importance of early intervention is crucial (WHO, 2016). Indeed, the seriousness of the situation is reflected in recent policies aimed at tackling health issues in young people, i.e. the Childhood Obesity Plan and Towards an Active Nation. Our research seeks to influence these and other social policy initiatives by considering hitherto overlooked concerns about Internet health knowledge, triggered by recognition of the pervasiveness of social media, and the ease of accessing Internet-based health resources.

5. Young teenagers increasingly search for health information online (Wartella et al. 2015) and concurrently maintain a significant social media presence (Jenkins et al. 2013). Accompanying the vast reach of social media are concerns about the potential for the spread of both misinformation and potentially health damaging Internet memes (Casey, In Press). Given this, and the current trends and patterns in the health behaviour of young teenagers, it is necessary to better understand what health knowledge and health messages young teenagers access/acquire on social media and how they respond. This is especially vital given evidence that social media is critical to 13-16 year olds' wellbeing (de Vries et al. 2016) and that tension exists between young teenagers' awareness of the risks of social media and their over optimism with regards to their vulnerability to such risks (Betts and Spenser, 2017). In concluding their study of 11- to 15-year-olds' perceptions of the risks and benefits of using technology, Betts and Spenser (2017, p. 32) argued "that young people regard technology use as normative" and "they are aware of the risks of using technology but are overly optimistic with regard the likelihood of experiencing […] risks."

6. The combination of important factors, i.e. the huge cost of unhealthy lifestyles to the NHS, growing concerns over teenagers' health and unhealthy lifestyles, the increasing importance of online sources of health information, the critical importance of social media to wellbeing, and the vulnerability of young teenagers, highlights the importance of MEMEotive.

4. Scoping Work

7. MEMEotive builds on the success of the EMOTIVE Project (Sykora et al 2013) - which was funded by the Defence Science Technology Laboratory following the London Riots - as a means of detecting and measuring emotions on text-based social media content. Furthering this work, MEMEotive aims to understand which Internet memes (defined as "a piece of culture […] which gains influence through online transmission" (Davison, 2012, p.122)) on social media gain traction and how they influence/motivate the health and health behaviours of young teenagers.

8. We have undertaken some preliminary research in this area and are seeking funding for a larger project. The purpose of both this preliminary work and the broader MEMEotive study is to gain a better understanding of the nature, transmission and impact of health knowledge and health messages contained in Internet memes and shared on social media sites among 13-16 year olds.

9. An Internet meme usually consists of an image with text. The same image can be re-used to convey different messages. Internet memes are generally viewed as entertaining but they also represent a body of cultural practice that does not account for the specific needs and rights of teenagers (Livingstone, Carr, & Byrne, 2016). If Internet memes carry political, corporate or other agendas without priorities tailored to the needs of 13-16-year-olds then they have the potential to do harm on a large scale (Wartella et al., 2015). We need to know the types of health information/knowledge that teenagers are exposed to because social media is an increasingly central aspect of their daily lives and social interactions.

10. Over a two week period we used the Twitter Search API to gather sample tweets concerning health. Specifically, we collected any tweets mentioning the hashtags: #meme, #fitnessaddict, and #flexibledieting (47,200 tweets). The latter two hashtags are fitness and diet related Internet memes, respectively. We also collected 29,220 tweets mentioning #tea as a relative control.

11. Our initial study revealed concerns about the perceived lack of emotion associated with the sharing of memes on Twitter. While the broader project seeks to explore Internet memes across Twitter, Instagram, and Pinterest, this lower than expected level of expressed emotion when Internet memes were shared on Twitter is worrying. Memes have the potential to normalise undesirable behaviours such as trolling, body shaming and bullying, and a lack of emotion may be indicative of a larger apathy with regards to such practice. These findings, which are explored in paragraphs 11 to 15, identified the need for a larger scale project.

12. The number of tweets containing #meme, over a brief time period, clearly represents a significant amount of user-generated content on the Twitter platform alone (see table 1 for an overview). To understand the emotional dimension around these conversations, we employed an established advanced sentiment

analysis tool, called EMOTIVE (Sykora et al. 2013), which uses a semantic linguistic model to identify explicit emotions in tweets. From the sample tweets (i.e. #meme, #fitnessaddict and #flexibledieting) EMOTIVE flagged 2,181 (4.62%) as containing some form of emotions. EMOTIVE also flagged 2674 (9.15%) #tea tweets as containing emotion.

13. Given the emotional analysis, and drawing on prior research using EMOTIVE, we are able to make some tentative observations.

  a. Considering that Internet memes can often normalise unhealthy behaviours, figure 1 highlights that a significantly large proportion of tweets across the three hashtags tended to contain the emotion of happiness. It is worth noting that nearly twice as much emotion was expressed in tweets containing #tea than in those containing #meme, and #fitnessaddict and nearly five time more than those containing #flexibledieting.
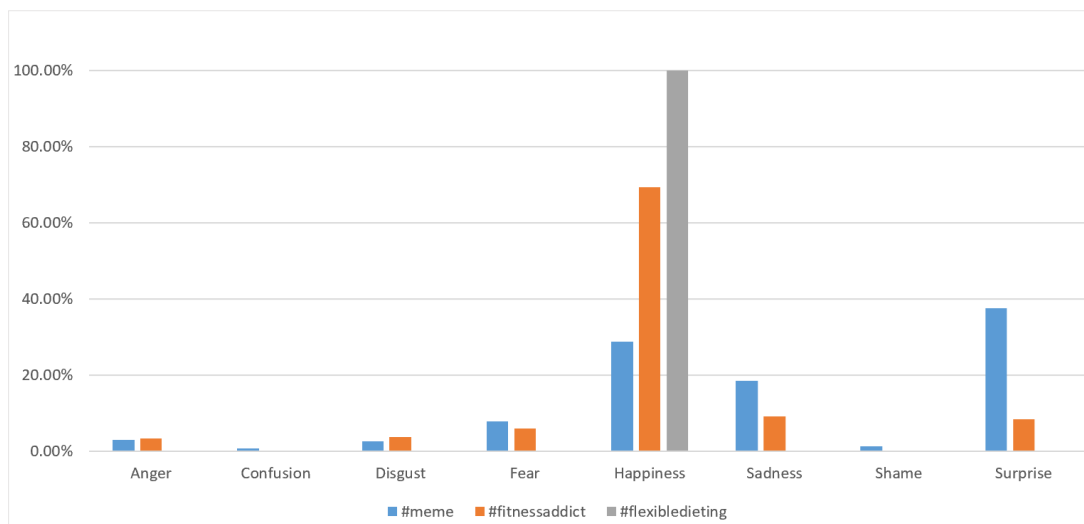

Figure 1 – Proportion of emotions across the eight basic emotions detected by EMOTIVE

  b. A previous study (Sykora et al. 2014), 1,570,303 tweets collected from 28 distinct tweet datasets relating to widely varied topics and events, and found that out of the posted tweets, on average 12% of them contained explicit emotions (standard deviation, 9%). Table 1 ("Emotionality %" column), shows that a very low proportion of tweets related to memes are actually expressing emotions.

Twitter Term	Total Tweets	Emotional Tweets	Emotionality %
#tea	29220	2674	9.15%
#meme	30757	1561	5.10%
#fitnessaddict	9868	505	5.12%
#flexibledieting	6575	115	1.75%

Table 1 – Overview of Tweets collected over a sample time-period (i.e., 24th May - 12th June),

c. Whilst the sample for this preliminary research equates to about 5% of Sykora et al.'s (2014) sample, it does uncover a potential 'hardening' of social media users' emotions towards memes. As shown in appendix 1, the imagery and text of Internet memes can be contentious and derogatory. Furthermore, in ridiculing body shape, diet and fitness there is a worry that we are also normalising obesity, poor diet and sedentary behaviour. If young people are buying into the same divisive ways of thinking, and are normalising potential damaging behaviour, then it is vital that we better understand the nature, transmission and impact of health knowledge and health messages contained in Internet memes and shared on social media sites among 13-16 year olds.

d. It is worrying that Internet meme content - which, by definition, has come to represent the Internet-fuelled propagation of items such as videos, jokes, rumours and websites (Shifman 2014) – produces a predominate sense of happiness regardless of the underlying tone or image used (see the appendix for examples of health-related Internet memes). If this is the broader case then we run the risk of normalising and accepting ridiculing and stereotyping of "non-normative", "fat", "unhealthy", "irresponsible", "at fault" individuals because of cultural ignorance.

e. If, as Dennett (2017, p.206 original emphasis) suggests, memes are "a way of behaving (roughly) that can be copied" then both information or misinformation might be "transmitted or saved under the [belief or] mistaken presumption that it is valuable". Like counterfeit money, which is saved and later spent, misinformation regarding health might be used to the potential detriment of the young person/persons concerned (Casey, In Press).

14. These results are only indicative, and a much more thorough computational, discourse and semantic analysis of these conversations is needed. Nevertheless, the above provides some useful and revealing insights into the Internet meme related social media chatter on Twitter.

15. In addition to more thorough analyses, substantially more context specific information relating to particular users (i.e. age, ethnicity, gender etc.) posting Internet meme related content, is needed. This information, coupled with an appreciation of how individuals react to health-related Internet memes and what immediate observable impacts these actually have on users, with respect to particular affected health related behaviours, will allow us to better understand the impact Internet memes are having on people's health. Our work in this area will allow us to delve further into the impact of Internet memes on social media, with particular reference to 13-16 year olds and their health. We seek to understand the ways in which young people share/comment on such Internet memes and the impact this might have on their health and their health choices.

5. Conclusion

16. With the prevalence of social media as a source of health knowledge among young people, and indications that Internet memes may be playing a part in a general apathy towards behaviours that ridicule individuals and groups who display "non-normative", "fat", "unhealthy", "irresponsible", "at fault" characteristics, the risks that this poses to future generations and our youth are noteworthy. This kind of social media content has largely gone unnoticed, and its effects, impact, prevalence and virality are, at best, poorly understood. It is hence important to investigate this area and seek to impact on social policy initiatives (such as those that emerge from this inquiry) as the potential impact of Internet meme appears to be harmful and yet this harm is hidden in images and text. If an Internet memes is "a piece of culture […] which gains influence through online transmission" (Davison, 2012, p.122) then we need to be increasingly mindful of the type of culture we wish young people to see, read and believe. We have it in our gift to make the world a better place but only, in this case, if we challenge undesirable behaviours such as trolling, body shaming and bullying that seem inherent in many Internet memes.

6. References

Betts, L.R. and Spenser, K.A. (2017). "People think it's a harmless joke": young people's understanding of the impact of technology, digital vulnerability and cyberbullying in the United Kingdom, *Journal of Children and Media*, 11:1, 20-35, DOI:10.1080/17482798.2016.1233893

Casey, A. (In Press). The Role of Internet Memes in Shaping Young People's Health-Related Social Media Interactions. In V.A. Goodyear and K.M. Armour (Eds.) *Young People, Social Media, Health and Wellbeing*. London: Routledge.

Davison, P. (2012). The language of Internet Memes. In M. Mandiberg, ed., *The Social Media Reader.* New York: New York University Press., pp. 120–136.

Health and Social Care Information Centre. (2015) *Health Survey for England 2014.* Health and Social Care Information Centre. Accessed on 18th July 2018 from http://webarchive.nationalarchives.gov.uk/20171010184802/http://content.digital.nhs.uk/catalogue/PUB19297/HSE2014-Data-Qual-Statement.pdf

Jenkins, H., Ford, S. and Green, J. (2013). *Spreadable Media: Creating Value and Meaning in a Networked Culture*. London: New York University Press.

King's Fund, The (2017). *Healthy Behaviours: Future Trends*. Accessed on 18th July 2018 from https://www.kingsfund.org.uk/projects/time-think-differently/trends-healthy-behaviours

Livingstone, S., Carr, J. and Byrne, J. (2016). *One in Three: Internet Governance and Children's Rights*. Innocenti Discussion Paper No.2016-01, UNICEF Office of Research, Florence.

Sykora, M.D., Jackson, T.W., O'Brien, A., and Elayan S. (2013). EMOTIVE ontology: Extracting fine-grained emotions from terse, informal messages. *International Journal on Computer Science and Information Systems*, 8(2), pp. 106-118.

Sykora M., Elayan S., Jackson T. W., O'Brien A. and Lunen A. v., 2014. *Twitter based Analysis of Public, Fine-Grained Emotional Reactions to Significant*

Events, European Conference on Social Media - ECSM 2014, Brighton, United Kingdom

de Vries, D.A., Peter, J., de Graaf, H., and Nikken P. (2016). Adolescents' social network site use, peer appearance-related feedback, and body dissatisfaction: testing a mediation model. *Journal of Youth and Adolescence*, 45(1), pp. 211-224.

Wartella, E., Rideout, V., Zupancic, H., Beaudoin-Ryan, L., and Lauricella, A. (2015). *Teens, Health, and Technology. A National Survey.* Evanston, IL: Center on Media and Human Development. School of Communication. Northwestern University

World Health Organization (2016). *Health Policy for Children and Adolescents No. 7. Growing up unequal: gender and socioeconomic differences in young people's health and well-being. Health Behaviour in School-aged Children Study: International Report from the 2013/2014 Survey*. Geneva: World Health Organization Regional Office for Europe. Accessed 18th July 2018 from http://www.euro.who.int/__data/assets/pdf_file/0003/303438/HSBC-No.7-Growing-up-unequal-Full-Report.pdf?ua=1
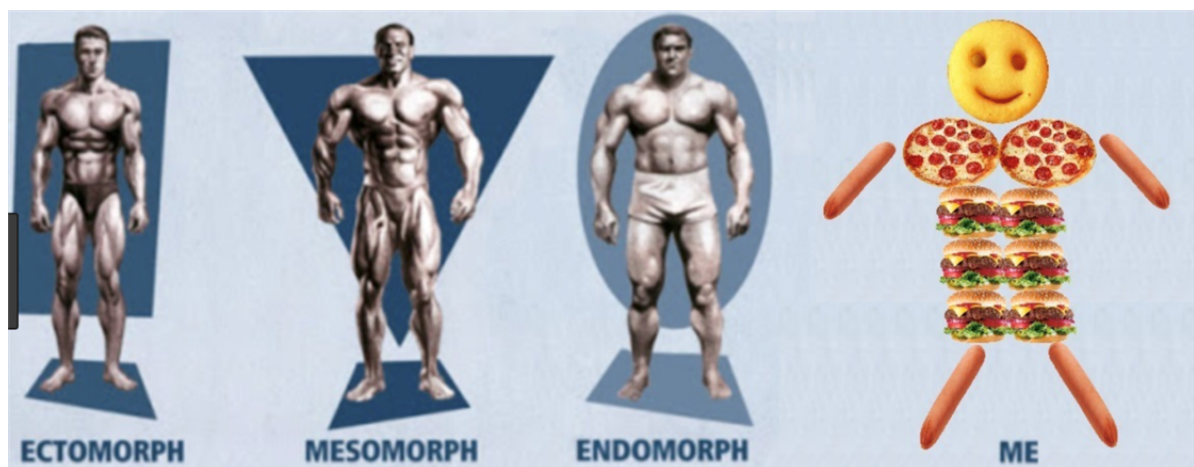
August 2018

<u>Appendix</u>

Sample Meme Images

A Google Images search conducted 25th July 2018.

#meme

#fitnessaddict

#flexibledieting