Institution: Edge Hill University
Unit of Assessment: Psychology, Psychiatry and Neuroscience
Title of case study: Understanding challenges in online communication and behaviour
Period when the underpinning research was undertaken: 2015-2020
Details of staff conducting the underpinning research from the submitting unit:

Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Dr Linda K. Kaye	Reader in Psychology	Oct 2011 to present
Dr Helen Wall	Senior Lecturer in Psychology	Sept 2012 to present
Dr Andrew Levy	Reader in Psychology	July 2010 to present

Period when the claimed impact occurred: Oct 2016 to Dec 2020
Is this case study continued from a case study submitted in 2014? N

1. Summary of the impact

Within the 21st century, many of our communication and interactions occur within online settings, such as email, social networking sites, and online gaming. Whilst these settings broaden the opportunities we have to connect with a range of people, they can bring a multitude of challenges to how we interact and understand one another. Research undertaken by Kaye at Edge Hill University from 2015 onwards has contributed a wide knowledge-base to understand some issues relating to online communication and behaviour. Kaye's expertise and leadership in cyberpsychology and track record in public and media engagement has enabled her research to inform and widen public understanding and debate on these critical new issues. Additionally, Kaye's research has informed the activity of media organisations, behaviour change campaigns, social enterprises, including the development and evaluation of a mental health disclosure app, designed to support workplace well-being. In 2020 Kaye acted as a representative of the British Psychological Society to formulate and present oral evidence to a major House of Lords Science and Technology Committee inquiry into the long-term impacts of 'living online'.

2. Underpinning research

All the work which underpins this case study commenced from 2015 onwards at Edge Hill University and fits into three themes detailed below.

Making accurate first impressions online

In 2015, a collaboration between Kaye, Wall (Edge Hill University) and Malone (Griffith University) was cemented. The team led research to explore issues such as how emoji reduce ambiguity in online communication [1], and how using certain emoji relate to user personality. The team developed the work, generating novel insights into the relationship with personality judgements [2]. This research revealed that emoji behaviour feeds into how we form first impressions online. Namely, using smiley emoji on social networking sites helps others to make accurate ratings of traits such as open-mindedness. Developing from this, the team also conducted research to explore how other forms of online behaviour impact upon personality judgements. This has revealed that other personality traits such as; conscientiousness and extraversion can be accurately detected by people when viewing unacquainted others' Facebook pages [3, 4]. As such, this work contributes to ongoing debate and awareness surrounding online first impressions and the extent to which these correspond to real-world first impression formation. Accordingly, the findings present new insight that online behaviours can support more accurate judgement making of trait-specific personality relative to face-to-face first impressions (e.g., openness to experience is not a trait that is easy to accurately detect in face-to-face settings). This therefore presents novel insight which contributes to the core areas of first impressions and judgement accuracy. Further, this work [e.g., 2, 3, 4] is underpinned theoretically by impression management theory (Goffman, 1959) and the work builds on core conceptual knowledge by applying how it relates to online forms of behaviour. Here, we have new evidence pertaining to how impression management efforts may differ online and how this impacts on the way we understand each other.

Personalisation of online behaviour

Kaye's ongoing collaboration with Wall as an expert in personality psychology has created capacity to develop work to understand how individual differences of users can impact upon their online behaviour. This includes how online users' personality traits relate to them using different types of emoji [2]. For example, those high in open-mindedness tend to use a more diverse range of emoji.

Also, how personality traits relate to different Facebook behaviours [3], such as extraversion often being related to the types of interactions users have online. Their work has also revealed that online language use feeds into different interpretations of others' personality, particularly that of extraversion [4]. Finally, their more recent work highlights how there are variations in people's susceptibility to persuasion based on their personality profile [5] which Kaye has recently discussed in relation to vulnerability to online scams, fake news, online trolling and cybersecurity vulnerabilities. This contributes to the core area of "personality and individual differences" in psychology whereby insights are being applied to novel contexts and behaviours.

Online communication and well-being

The final theme of Kaye's research explores psychosocial outcomes associated with online technology. This work has related to digital gaming (e.g., Kaye, Carlisle & Griffiths, 2019; Kaye, Kowert & Quinn, 2017), open worlds (Kleban & Kaye, 2015) and most notably, online chat platforms (Kaye & Quinn, 2020). The latter of these, in output [6] illuminates the way WhatsApp facilitates varying types of social support and how these are related to factors such as social capital, collective identity, quality of relationships and in turn, aspects of positive well-being. This work is situated in core theoretical debates about the role of technology in society and the extent to which time using technology displaces (displacement hypothesis) or stimulates (stimulation hypothesis) social interactions with others and functions for well-being. Indeed, the work contributes to the latter of these, to present a nuanced insight into the specific support motivations for technology use and how these may be fundamental to understanding the range of impacts on individuals and society.

3. References to the research

Outputs 1-6 have been peer-reviewed in journals of international standing.

[1] Kaye, L. K., Wall, H. J., & Malone, S. A. (2016). "Turn that frown upside-down": A contextual account of emoticon usage on different virtual platforms. *Computers in Human Behavior, 60,* 463-467. doi: 10.1016/j.chb.2016.02.088.

[2] Wall, H. J, Kaye, L. K., & Malone, S. A. (2016). An exploration of psychological factors on emoticon usage and implications for judgement accuracy. *Computers in Human Behavior, 62*, 70-78. doi: 10.1016/j.chb.2016.03.040.

[3] Darbyshire, D. E., Kirk, C., Wall, H. J., & Kaye, L. K. (2016). Don't Judge a (Face)Book by its Cover: Exploring Judgement Accuracy of Others' Personality on Facebook. *Computers in Human Behavior, 58*, 380-387. doi:10.1016/j.chb.2016.01.021

[4]. Kaye, L. K., Wall, H. J., & Hird, A. T. (2020). Less is more when rating Extraversion: Behavioural cues and interpersonal perceptions on the platform of Facebook. *Psychology of Popular Media, 9* (4), 465–474. https://doi.org/10.1037/ppm0000263

[5] Wall, H. J., Campbell, C. C, Kaye, L. K., Levy, A. R., & Bhullar, N. (2019). Personality Profiles and Persuasion: An exploratory study investigating the role of the Big-5, Type D Personality and the Dark Triad on Susceptibility to Persuasion. *Personality and Individual Differences, 139*, 69-75. https://doi.org/10.1016/j.paid.2018.11.003

[6] Kaye, L. K. & Quinn, S. (2020). Psychosocial outcomes associated with engagement with online chat systems. *International Journal of Human Computer Interaction, 36* (2), 190-198. doi: 10.1080/10447318.2019.1620524

4. Details of the impact

Widening public understanding and debate of online behaviour

Kaye has a widely accessible public profile and is regularly invited as an expert commentator on many issues relating to social media, gaming and online behaviour. This in part is supported by her innovations in making her research insights open and accessible through Open Science Framework and in creative solutions such as visualisations and animations of research findings (e.g., using the animation software Powtoon, hosting a YouTube channel) and through her commitment to public engagement. This has enabled wide public access to academic knowledge and thus widened public understanding of the issues surrounding online behaviour. Her work on emoji within online communication has enjoyed substantial public and media interest in which the work [largely output 2] has been represented on a variety of popular media and news platforms.

Notably the work on "what your emoji says about you" (insights primarily drawn from output 2) has featured in a number of prominent public arenas. One includes The Conversation website which has received more than a 330k views since its publication in April 2016. Following this, this work [output 2] has also been featured on SciShow (a popular Science YouTube channel) which has been viewed 323,042 times to date. Additionally, this video generated a number of discussions within the comments section as viewers debated their own emoji use. Additionally, the news channel CNN produced a piece on this work for the health area of their news website, representing a global reach of the research. Finally, a combination of all media as well as academic engagements in this research also resulted in Kaye being invited to present her ideas at the prestigious TEDx conference series. Specifically, this took place on 21st October 2017 in the Vienna Voltstheater in front of a live audience of approximately 1000 delegates, concurrently with a global live stream. The recording of the talk currently has a YouTube view-rate of nearly 4k views. Kaye's attendance at the conference enabled a direct impact upon widening understanding of how we form first impressions online.

In addition to directly contributing to widely viewed media pieces Kaye's research has been specifically reported on a by both the written media and new media demonstrating exceptionally high engagement on the topic. For example, pieces on "zoom fatigue" have appeared in a number of sources including The Daily Telegraph with an online reach of around 94 million readers annually, and in "PsychReg" which saw her blogpost reach 62,000 reads.

As a result of Kaye's extensive media profile and wide public engagement work there are numerous examples where the research has resulted in public interaction and demonstrated widening of public understanding and offered opportunities up for new debates. As an example, a comment emanating from an a Youtube viewer of the TEDxTalk *"You wouldn't think something we might take for granted like using an Emoji can tell you something about a person's personality"* demonstrates previously large gaps in public understanding.

Further, when the YouTube link was shared on Twitter, user posts have indicated that the insights made people re-think the use of emoji in online behaviour (source 1). For example, one user said: *"Great talk…Found it very interesting as an avid emoji user! Definitely be contemplating my emoji use more carefully from now on…"*

Following extensive global media coverage into emoji use, the British Psychological Society (BPS recognised the significance of Kaye's work in this field and invited her to lead a number of public engagement events around the issue of the "psychology of emoji" (informed by the research detailed here). These were organised by the BPS's regional branches who run "Psychology in the Pub" (PitP) events which are designed as outreach events for helping psychological evidence reach the public domain. These took place in March 2018 (in York, organised by BPS North West branch), April 2018 (in Birmingham, organised by BPS West Midlands branch) and May 2018 (in Manchester, organised by the BPS North West branch). Kaye developed a short quiz for the end of each talk via the platform "Kahoot" which allowed delegates to respond to multiple choice questions via their Smartphone, whereby they can indicate the extent of their learning from the event. This highlighted that after the events, from a total delegate attendance of around 80 people, 92.3% felt they now knew more about the psychology of emoji, and 76.9% reported that the talk had made them think at least a little bit more differently about their online behaviour (Source 2).

The work has penetrated wider public entertainment media too, as a blog written by the Presenter and Writer Danny Wallace about the use of emojis in communication. Prior to composing the blog, Wallace made contact with Kaye in October 2019 and gained insights about how different emoji feed into people's perceptions of others. His blog piece "The ☺ is a Tiny Menace" cites Kaye strongly and links to her work, and also includes insights brought from the research. For example: "*Linda Kaye is a cyberpsychologist….Kaye studies emoji because they're actually useful in this digital age. As she has written, '[I]t turns out they may be serving a range of important psychological and social functions within human communication.'*"

The blog generated considerable interest, and among the reader responses, include evidence about how these insights have changed people's understanding of their emoji use. For example, one reader commented: *"This had me laughing out loud at first… probably because this is my favourite emoji! What does this say about me?! I'm going to ponder this for the rest of my day."*

Finally, between February and March 2020, Kaye was contacted by the BBC on two occasions to inform and contribute to educational media campaigns. The first was BBC Bitesize Education for a series of educational videos for 11-16 year olds on detecting fake news. This involved Kaye offering expert advice on the influences behind fake news vulnerability (such as those gained from output 5) and practical advice to encourage self-monitoring when interacting with online content. The second commission was from BBC Trending in which Kaye was asked to provide expert comments for a story on online trolling. This story consisted of a BBC journalist bringing together a troll and his target to understand the psychology behind trolling behaviour. Drawing on her work (such as from output 5), alongside her other work applying social identity theory to online settings (e.g., Kaye, Carlisle & Griffiths, 2019; Kaye, Kowert & Quinn, 2017), Kaye provided commentary to accompany the piece. This was featured on BBC World Service Trending and the lead journalist provided extensive Twitter coverage in the form of threads to document the story and associated input from Kaye (Source 5).

Informing public and business behaviour change
In June 2019, the social team at Change Incorporated which is a media company owned by VICE Media Group, utilised Kaye's research expertise to inform the design of an anti-smoking emoji to be launched on World Emoji Day. Kaye's involvement included input into the PR campaign to provide her expertise on why emoji should be an asset to the campaign strategy (Source 3). As a result of these discussions, Change Incorporated also developed a video which was disseminated on the platform of Facebook which illustrated why emoji may be effective tools to support behaviour-change campaigns around smoking cessation.

A further example is that Kaye's expertise in cyberpsychology, resulted in her being invited as an expert consultant on a number of campaigns to reduce vulnerabilities in online worlds (online scams, fake news and online trolling). One was for Which? Magazine in their recent campaign surrounding online scams. Kaye was asked to review victim testimonials from a Bitcoin scam and give insight into the persuasive techniques utilised within this particular scam. This was well-informed from her research work which has established the "personality of persuasion" [5], in which she has established how the principles of persuasion may operate in respect of victim susceptibility. These insights appeared alongside a large feature in the December 2019 issue of the magazine and also in supplementary video content on the online piece. A statement supplied by journalists at Which? Magazine the importance of this contribution; *"I believe Dr Kaye's expert view has provided our readers with a powerful and important insight into the psychological pressure exerted by fraudsters. It is my hope that readers will be better placed to sport such tactics after reading Dr Kaye's contribution"* (Source 4). They also make reference to the fact that the video content which Kaye contributed to had received almost 2000 views to date. Following this, Which? contacted Kaye again in July 2020 for an expert commentary on online bank scams in the context of Covid-19. This was subsequently featured in the September 2020 issue of the magazine.

Based on Kaye's expertise in cyberpsychology and associated work in output 5, in April 2020, the company "Trend Micro", a global leader in cybersecurity solutions, contacted Kaye to request her collaboration in developing a campaign for the communications and marketing company WE Worldwide, around human-based threats in the office, with regards to cybersecurity. Kaye's involvement included developing a user questionnaire, interpreting the findings to develop cyber personas to help develop tailored cyber-threat mitigation training, writing a white paper with key findings, and supporting post-campaign dissemination. Of greatest relevance, Kaye's expertise from output 5 on personality profiling ensured an evidence-informed approach to interpreting the user findings which could support the development of a targeted campaign to mitigate human factors in cybersecurity. As well as being represented in a White Paper ("Persona Report"- Source 6), the findings of the work appeared across the national and international press (e.g., Enterprise Times- 38k readers) as well as in trade press (e.g., Business Wire) in which Kaye was heavily cited: Kaye's analysis and insights heavily influenced Trend Micro's "Persona Report" which outlines the various personality profiles of user and gives advice to IT leaders on cybersecurity support and training provision.

The work in output [6] led the Director of a social enterprise company "Inside Out", to contact Kaye in the spring of 2020 to ask her to advise on the development of a mental health disclosure app "FormScore" (publicly available on app stores "Inside Out" is an enterprise dedicated to supporting

mental well-being. This output formed the basis for an [evidence review](#) to inform the rationale for the app. Kaye subsequently became an Advisory Board member on the development of the FormScore app which is currently being piloted by many businesses to support employee well-being. Within the [Business Pilot](#), Kaye provided academic input and oversight on the evaluation of the work to provide scientific rigour in knowing whether intervention outcomes are attributable to the app. As of December 2020, several businesses had signed up to take part in a pilot, including the tech recruitment company "Austin Fraser", the social enterprise organisation "Bring change to mind" as well as much international interest in the USA and Australia. Kaye's input not only involved overseeing the academic integrity of the pilot, but also hosting, analysing, interpreting and disseminating the evaluation data for each organisation (source 7). Kaye's involvement in the Business Pilot is therefore providing a strong evidence-base to inform further development of the FormScore app and a large-scale roll out internationally. Evaluation data from the initial business pilots suggests that those who have used the app have experienced significant improvements in some aspects of mental well-being, indicating some promising outcomes for the efficacy of the app. Kaye's contribution has been key to the success of the pilot as the CEO of InsideOut states *'The research of Dr Kaye in this area was invaluable in helping validate the FormScore idea in that we are creating a direct means of connecting with others around our mental wellbeing. This in turn was helpful for both the development team and gave comfort to investors.'* (Source 8). The app has been downloaded from app stores more than 1000 times to date and on average is being actively used daily on at least three-quarters of unique devices. The Business Pilot of the FormApp is anticipated to reach over 20 businesses with over 50,000 users in the next 12 months across a number of territories and industries.

Contribution to Parliamentary inquiry about mental health impacts of living online
Finally, in November 2020, Kaye was selected as the representative for the BPS in giving oral evidence to the Science and Technology Committee of the House of Lords as part of their response to their call for evidence about the long-term impact of living online. The policy advisor to the BPS explains '*Dr Kaye offered substantial evidence to help the BPS Policy Team develop a full consultation response… As a result, we contacted the Committee to recommend Dr Kaye based on her expertise in cyberpsychology could represent the BPS to give oral evidence'*. Kaye gave an opening address and evidence focusing on the mental health impacts of living online. Drawing on insights from output 6, she gave empirical evidence about the ways online communication can support well-being, as well as wider critical considerations of the factors which determine how technology use relates to well-being. This took place on 15th December 2020 to the House of Lords COVID-19 Committee (broadcast available [here](#) as well as video summary message shared via Twitter [here](#)), and was in addition to the BPS' response to this call in which Kaye coordinated a response on behalf of the Cyberpsychology Section (Source 9). Following this, a number of Kaye's recommendations from the hearing were taken forward to the House of Commons, including how social technology companies may make better use of their platforms for encouraging good etiquette and regulatory behaviours and have ethical frameworks for data-sharing (Source 10). '*It is already the case that her expertise has contributed both to the written and oral evidence for this consultation, and that her recommendations given in the Committee session are being taken forward to the UK Government who will respond and implement as appropriate' (source 9).*

5. Sources to corroborate the impact
Source 1. Complication of Twitter Comments
Source 2: Summary of delegate responses from PitP events via Kahoot platform
Source 3: Change Incorporated Press release
Source 4: Factual Statement - Which? Magazine
Source 5: Example tweet from BBC journalist Marianna Spring
Source 6: Persona Report from Trend Micro
Source 7: Business Pilot Information
Source 8: Factual Statement - CEO of InsideOut
Source 9: Factual Statement - BPS Policy team
Source 10: House of Lords Transcript