**Executive Summary:**

**Information Discernment and Psycho-Physiological Well-Being in Response to Mis-Informed Stigmatization: Believing ‘fake news’ induces stress and could be bad for your heart**

**Introduction:**

Mis-information especially in the form of fake-news, dis-information or alternative facts is becoming ever more pervasive and problematic, to such an extent that the UK Parliament’s Digital, Culture, Media and Sports Select Committee has been running an inquiry into fake news during 2017 and 2018. To date, it is unclear how mis-information effects the well-being of individuals and to what extent it might have a protective effect. One possible answer may be in the form of information discernment, a sub-set of information literacy which is a person’s psychological ability to make well-calibrated judgements about information. Indeed, research indicates that individuals with high levels of information discernment tend to make very complex and balanced judgements about information whereas those who are low information discerners use a limited set of, or no, criteria when judging information. This is the first inter-disciplinary study to draw upon information science, psychology and user-experience to determine whether users react physiologically as well as psychologically when making judgements about information.

Despite almost unremitting access to information, the combined psychological and physical impact of exposure to mis-information such as ‘fake news’ upon healthy individuals remains poorly studied. Psychological responses have been measured to determine whether exposure to mass-media related terrorist events influence the reporting of stress symptoms, yet the combined physiological and psychological evidence remains scarce. Thus far, only two studies have investigated the effects of viewing the news and the physiological consequences to stress. This is why our study is the first to use a multi-disciplinary approach to measure how users behave, think and react physically when making judgements about online information.

**Method:**

In our study, forty eight 18-24-year-old men were initially asked to answer questions on how they consumed news and information. These questions included whether they always go to their favourite news site to look for news, if they think knowledge can be contradictory, if they check who has written something online before sharing it, and whether they look for more than one source when checking a fact. The participants were then connected to a Finometer to measure blood flow and heartrate and an eye-tracking device whilst they read six news stories with a religious theme. Participants were also asked to tackle an impossible-to-complete word search to create mild stress. They were led to believe they were helping to win £100 for another participant. Some received information that revealed, falsely, that the other participant had strong religious views. Blood flow, heart rate and eye tracking data was captured throughout this process, and participants were asked to describe how they felt about the word search task.

**Results:**

Overall, our results suggest that information discernment can affect our physical and psychological health in several ways. First, information discernment levels affect the way in which we approach stressful tasks. Individuals are challenged if they believe that their resources (i.e., self-efficacy, perceptions of control, and goal orientation) outweigh the perceived demands of a task, whereas they feel threatened if these resources are not sufficient to meet the perceived demands. When presented with mis-information, higher discerning individuals viewed the stressful situation as more of a challenge, rather than a threat to their well-being. Second, when presented with mis-information, higher information discernment levels resulted in more favourable (i.e., adaptive and healthy), physiological outcomes. Specifically, individuals with high discernment responded to stress with a more efficient blood flow, equating to a healthier heart response. Third, when given mis-information, higher information discerning individuals responded with more positive emotions before and after the stressful task, in comparison to lower information discerning individuals. Fourth, high information discernment corresponds with high concentration and low information discernment corresponds with low concentration. Finally, high information discerners are more curious, tend to use multiple sources to verify information, are more likely to be sceptical about information on search engines such as Google, do not regard the first results page as the most trustworthy information and are cognisant of the importance of authority. Conversely, low information discerners are significantly less likely to be aware of these issues and are generally dismissive of the content put in front of them.

In sum, we found that, when presented with mis-information, higher levels of information discernment resulted in more positive heart, emotional, and concentration in responses, which ultimately all contribute to a healthier stress response.

**Conclusions:**

The analysis of the gathered data presents initial findings for the importance of information discernment capability. First, high information discerners are different to low information discerners in the characteristics that they report. They are more curious, sceptical and realise the importance of questioning who authored a piece of information. Second, within our current data set, for individuals who were provided with mis-information, levels of information discernment heralded diverse results. To illustrate, those within the high information discernment group produced more favourable appraisal, heart, and emotional responses towards a stressful event, than those within the low information discernment group. Additionally, higher reporting of information discernment significantly associated with higher reporting of positive emotions. These observations, of healthier physical and psychological responses, support the contention that information discernment is a critical ability for individuals to possess, specifically when dealing with mis-information. Third, high information discernment corresponds with high concentration and low information discernment corresponds with low concentration. Moreover, there appeared to be a level of disengagement with the content, particularly for participants with low information discernment. Conversely, high information discerners tended to interrogate the whole document, text, graphs and images in a structured way.

In summary, high information discerners tend to be more curious about information and who wrote it, they will interrogate a piece of information methodically and attend to all aspects presented to them and finally, they will respond to mis-information in an adaptive (challenged) way and with a positive emotional reaction.

## Recommendations

Librarians and teachers of information literacy

1. It may be useful to think about using the information questionnaire constructed here to ascertain learners’ information discernment capabilities before beginning to teach them. This may help in developing more effective teaching interventions.

Policy makers

1. There is an implication regarding the negative impact of “fake news” on health. This negative impact may be reduced by providing information literacy training within the school curriculum at the earliest opportunity in a child’s learning journey.
2. Our data strengthen the argument for embedding information literacy teaching in the school curriculum. Policy makers can also use the evidence generated here to advise on the strategic direction for young peoples’ well-being in every-day and educational environments.

Health professionals

1. Health professionals will be interested in this research because this project has demonstrated a link between mis-information and heart responses, which may imply that health care recommendations are required.

The general public

1. This research will be of use to parents enabling them to be aware of the effects misinformation may have on family well-being.