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Evaluation of *Headtorch WORKS* as a workplace intervention for improved support and understanding of co-workers with poor mental health and well-being

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Author Note

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## 1           Abstract

2           Promoting mental health in the workplace and creating a supportive environment for  
3 those experiencing poor mental health are important strategies that can be implemented by  
4 workplaces. The present research evaluates the effectiveness of *Headtorch WORKS*, a mental  
5 health and well-being intervention that consists of three online episodes, including original  
6 filmed drama and specialist documentary, intercut with a variety of open and closed  
7 questions. To evaluate the *Headtorch WORKS* intervention, a number of psychological  
8 measures were developed and adapted for a workplace context. These measures examined the  
9 topics of social distance, interaction, stigma, empathy and presenteeism. Data were obtained  
10 from fifty-five employees from six participating companies, with this process taking six to  
11 nine weeks for each company. Twenty-nine employees were part of the experimental group  
12 and twenty-six were in the control condition. Data from an additional 122 undergraduate  
13 students and 130 employees were used to examine the measures and to evaluate their  
14 psychometric properties. The main study took the form of a pre/post- design where  
15 individuals were tested before and after the *Headtorch WORKS* intervention. Results showed  
16 no significant effects on our measures of stigma, empathy and presenteeism, but we did find  
17 improvements in our measures of social distance and interaction.

18           *Keywords:* mental health, intervention, social distance, workplace, employee

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1 Evaluation of *Headtorch WORKS* as a workplace intervention targeting attitudes towards  
2 mental health and well-being  
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5 In the UK, for 2018/2019 44% of work-related illness was due to work related stress,  
6 depression or anxiety, which resulted in an estimated 12.8 million working days lost; this  
7 equated to 54% of all working days lost (Health and Safety Executive, 2019). Well-being and  
8 mental health are affected by job strain and work characteristics such as lower perceived job  
9 control, increased job demands and lower social support by supervisors (i.e., emotional  
10 concern, instrumental and information support, and appraisal). While the relationship can be  
11 bidirectional so that well-being and mental health can affect work, work characteristics can  
12 have a larger negative effect on well-being than vice-versa (De Lange, Taris, Kompier,  
13 Houtman, & Bongers, 2004). Additionally, Villotti, Corbière, Zaniboni, & Fraccaroli (2012)  
14 have shown that there is an interplay between individual factors and environment, but  
15 workplace accommodations and social support from co-workers were most important in  
16 predicting job satisfaction for individuals with severe mental health problems. Even when  
17 familial factors related to mental health disorders are taken into account, job demand and  
18 strain still have an effect on rates of sick leave due to mental health problems (Mather,  
19 Bergström, Blom, & Svedberg, 2015).

20 Despite the negative effects of job demand and strain, employment itself plays a very  
21 important positive role in promoting well-being, through providing psychological  
22 experiences such as social contact, personal identity in society, purpose, time structure and  
23 regular activities (Harnois & Gabriel, 2002; Paul & Batinic, 2010). In the UK, overall mental  
24 wellbeing decreases with unemployment, with more than double the proportion of  
25 unemployed individuals (30.2%) reporting low mental well-being in comparison to both  
26 those in non-permanent (14.3%) and permanent employment (12.1%) (Gray et al., 2019).

1           While it may be difficult to address specific workload issues, taken together, these  
2 findings suggest that social workplace conditions are an important modifiable factor that can  
3 be improved with workplace interventions. Making appropriate accommodations for  
4 individuals with poor mental health leads to greater job satisfaction and reduces the chance of  
5 them developing a mood or anxiety disorder (Bolo et al., 2013; Villotti et al., 2012).  
6 Accommodations that involve flexibility at work as well as fostering social support and  
7 understanding in the workplace have been shown to be most beneficial for individuals with  
8 poor mental health and well-being. However, accommodations can only be successfully  
9 implemented if employers, managers and colleagues all understand their importance.

10           While mental health literacy has been increasing among employers, there appears to  
11 be a discrepancy between knowledge about mental health and the development of  
12 accommodations for employees with mental health problems, which are known to promote  
13 mental well-being at work. For instance, 33% of 550 British employers investigated in 2006  
14 reported that none of their employees were expected to develop a mental health problem  
15 (Little, Henderson, Brohan Thornicroft, 2011). The percentage dropped to 7% in 2009,  
16 showing an improvement in understanding and knowledge of mental health problems in the  
17 workplace. Furthermore, from 2006 to 2009 there was an increase from 68% to 87% in  
18 employers agreeing that they were likely to be flexible if an employee developed a mental  
19 health disorder, and that they would offer adjustments to accommodate the person. Although  
20 understanding of the need for further training and support increased in 2009, the proportion  
21 of companies who had accommodated any mental health policies did not change – only 1/3 of  
22 the investigated companies reported that they had done so. However, a later survey  
23 (Chartered Institute of Personnel and Development, 2018) showed an improvement in more  
24 recent years, where the proportion of organisations providing training that focused on coping  
25 techniques increased to 44% in 2018, in comparison with 26% in 2016.

1           Despite these improvements in understanding the relationship between mental health  
2 and well-being, and the need for support and training, the limited implementation at an  
3 organisational level is worrying. For instance, regarding presenteeism (going to work when  
4 knowingly unwell) only a quarter of the 1021 organisations surveyed in November 2017 were  
5 taking steps to discourage it (CIPD, 2018). This was a large reduction from figures in 2016,  
6 when 48% of organisations had taken action. Similarly, only 32% of companies reported  
7 training managers to support staff with poor mental health. While this is an increase from the  
8 22% in 2016, the report voices concern that the number is still low, especially when  
9 considering the important role that managers play in promoting good mental health. It  
10 appears that with the increase in mental health literacy, there seems to also be an  
11 improvement in attitudes towards mental health, leading to the implementation of policies  
12 and accommodations. These policies address the ‘managing illness’ component from  
13 LaMontagne et al. (2014)’s model in improving the workplace environment. LaMontagne et  
14 al. (2014) postulated a model that addresses workplace accommodation along three pathways  
15 – preventing harm by reducing work-related risk, promoting the positive aspects of the  
16 workplace and the worker’s strengths, and managing illness. Hence, while there is a move  
17 towards increased sympathetic management of illness, adoption of policies that address the  
18 public health aspect of preventative measures and the psychological component of the model  
19 are still rare.

20           The above findings echo research that has been conducted on the stigma surrounding  
21 mental health, especially in the corporate world, with 35% of employees believing that  
22 mental health problems might prevent future promotions (Stevenson & Farmar, 2017) and  
23 32% of employers stating that mental health problems make employees less reliable (Little et  
24 al., 2011). These prejudiced attitudes are also mirrored by the general public in the USA,  
25 where between 47- 63% of individuals show a desire for increased social distance from

1 people with mental health problems (Link, Phelan, Bresnahan, Stueve, & Pescosolido, 1999).  
2 Similar findings have been found in Europe, Asia and Australia (Angermeyer & Dietrich,  
3 2006; Krendl & Pescosolido, 2020; Reavley & Jorm, 2011). For example, a study with a  
4 7000-participant sample across Germany, Russia and Mongolia showed that beliefs about the  
5 root cause of mental health conditions (depression and schizophrenia) affected the general  
6 population's willingness to be socially close to a person who was experiencing that condition.  
7 That is, the desire to have social distance from someone with a mental health condition  
8 increased when the condition was defined as being biological, as opposed to stemming from  
9 environmental causes such as acute stress (Dietrich et al., 2004). Moreover, having  
10 preconceived notions that the condition arose from a 'lack of will' for example, additionally  
11 led to an increase in social distance (Dietrich et al., 2004). Social distance can be defined in  
12 the current context as the willingness of someone to participate in social contact at varying  
13 degrees of closeness with a person displaying evidence of poor mental health (Link, Phelan,  
14 Bresnahan, Stueve, & Pescosolido, 1999) and so can be used as a measure of stigma. Two of  
15 the components from LaMontagne et al.'s (2014) model for improving the workplace  
16 environment – promoting the positive aspects of the workplace and worker's strengths and  
17 reducing work-related risk – highlight the need to tackle stigma towards poor mental health.  
18 This is because stigma can often lead to a breakdown of social relationships in the workplace,  
19 including rejection, avoidance and a perception of lower competence (Couture & Penn, 2003;  
20 Pinfold, Byrne, & Toulmin, 2005).

21 Individuals suffering from poor mental health and well-being may face stigma if they  
22 disclose their conditions, but also face personal costs if they do not. This is because stigma  
23 from external sources can lead to self-stigma (Donaldson-Feilder & Bond, 2004). Stigmatised  
24 groups can turn prejudices upon themselves, resulting in a loss of self-confidence and self-  
25 esteem (Rüsch, Angermeyer, & Corrigan, 2005). Moreover, fear of exclusion arising from

1 being a part of a stigmatised group has been shown to comprise a central aspect of self-  
2 stigma (Couture & Penn, 2003). In this way, the stigma towards people with poor mental  
3 health can lead to under-reporting as an attempt to avoid these personal costs, and can result  
4 in exclusionary behaviour from co-workers. This is evident in the figures that show only 28%  
5 of employees with mental health problems engage with someone at work regarding their  
6 situation, and only around 53% report that they feel comfortable discussing their mental  
7 health issues at work (Business in the Community, 2017). When employees do not disclose  
8 mental health problems and continue to work, this can result in a substantial cost to  
9 employers. Being absent from work due to poor mental health cost the UK workforce around  
10 £10.6 billion in 2017, and reduced productivity at work (presenteeism) cost around £21.2  
11 billion (Parsonage & Saini, 2017), with some sources quoting even larger costs – between  
12 £33 billion and £42 billion (Stevenson & Farmar, 2017). More importantly, over 25% of  
13 employees report observing an increase of presenteeism at work in the previous year (CIPD,  
14 2018). Battling stigma towards mental health, and improving attitudes towards individuals  
15 with poor mental health thus becomes an important tactic for improving the workplace  
16 environment and minimising the personal costs for individuals struggling with poor mental  
17 health.

18           Research that focuses on strategies for battling stigma focus on contact with  
19 stigmatised individuals, or on education about the specific stigmatised condition (Corrigan,  
20 Morris, Michaels, Rafacz, & Rüsçh, 2012, Rüsçh, Angermeyer & Corrigan, 2005). The  
21 former approach follows the intergroup contact theory, which posits that contact with  
22 individuals from the stigmatised group improves attitudes and behaviour intentions through  
23 empathy, ‘mere exposure’ and anxiety reduction (Pettigrew & Tropp, 2008; Pettigrew, Tropp,  
24 Wagner, & Christ, 2011). In contrast, education aims to minimise stigmatising attitudes by  
25 providing contradictory information to that held regarding the stigmatised group. In the



1 workplace, directors and managers have to date mostly utilised the education approach,  
2 through providing information about recovery and social inclusion, listening and caring and  
3 encouraging disclosure (Corbière, Samson, Villotti and Pelletier, 2012). Whereas both  
4 education programs and facilitating direct contact with individuals from the stigmatised  
5 group have similar overall effects in improving stigma, in the form of change in attitudes and  
6 behaviours, education programs tend to have larger effects on adolescents, while adults  
7 appear to respond more to direct contact (Corrigan et al., 2012). Exposing participants to  
8 direct contact with people from a stigmatised group, such as individuals with poor mental  
9 health, has been shown to reduce stigma and social distance (Couture & Penn, 2003, 2006).

10         One of the means by which contact is proposed to affect stigma is through increasing  
11 empathy and perspective taking (Pettigrew & Tropp, 2008; Pettigrew et al., 2011). Empathy  
12 has been suggested to be crucial for effective work practice anywhere that interaction  
13 between people is present, which is key for any healthy workplace (Gerdes & Segal, 2011).  
14 Empathy can be divided into affective and cognitive empathy. While affective empathy is an  
15 immediate reaction to other people's feelings, cognitive empathy relates to the ability to  
16 adopt someone else's perspective (Stayer, 1990). Meta-analytical findings show that empathy  
17 training can improve individuals' empathy scores, interpersonal relationships and prosocial  
18 behaviours (Teding van Berkhout & Malouff, 2016). In the workplace, where people with  
19 mental health and well-being problems face social exclusion due to stigmatisation, empathy  
20 training could be beneficial for the improvement of social relationships. This is especially  
21 important because positive workplace interactions have been shown to be important for job  
22 satisfaction and positive well-being (Dimotakis, Scott, & Koopman, 2011; Harvey et al.,  
23 2017; Sanne, Mykletun, Dahl, Moen, & Tell, 2005; Stansfeld & Candy, 2006).

24         Thus, although work demands can lead to decreased mental health and well-being,  
25 positive social interactions and support at work can lead to improvements in the same. It is

1 important to combat negative attitudes in the workplace in order to facilitate a supportive  
2 environment, in which people with poor mental health feel comfortable to disclose this,  
3 which in turn minimises presenteeism behaviour. This could prevent loss of employment  
4 brought about by poor mental health and well-being, which can in turn affect wellbeing  
5 negatively (Cole, Daly, & Mak, 2009). Thus, educating on the effects of poor mental health  
6 on productivity and promoting understanding and empathy towards co-workers with poor  
7 mental health should lead to the development of better workplace social relationships, and  
8 better attitudes.

9 Not surprisingly, there has been more than one strategy employed to battle stigma and  
10 improve attitudes towards individuals with poor mental health in the workplace (Hanisch et  
11 al., 2016). The most popular - 'Mental Health First Aid' (Hanisch et al., 2016; Kitchener &  
12 Jorm, 2004), covers assisting in mental health crises and early stages of mental health  
13 problem development. Kitchener and Jorm's (2004) randomised controlled trial with week-  
14 long training of 300 participants showed improvement in social distance, confidence in  
15 helping others, and improvement in own mental health. Unfortunately, there was no effect of  
16 the training on the participants' beliefs about treatment, and the recognition of the disorders  
17 from vignettes depicting depression and schizophrenia. Nevertheless, Kitchener and Jorm's  
18 (2004) evaluation with government employees shows that even short training sessions can  
19 produce improvement in attitudes towards individuals with poor mental health, specifically in  
20 terms of social distance and in participants' confidence in helping individuals with mental  
21 health problems.

22 The present research evaluates the effectiveness of the *Headtorch WORKS* as a  
23 workplace-based intervention. The intervention was developed by a Glasgow-based start-up  
24 company *Headtorch*, in order to change attitudes towards mental health in the workplace.  
25 The intervention is a blended online course that aims to increase colleagues' understanding of

1 the impact of their attitude and levels of empathy on each other's mental health and well-  
2 being, and to increase their confidence in having supportive conversations with colleagues, if  
3 it is thought they may be struggling due to their mental health. It further aims to improve  
4 attitudes towards flexibility for people with mental health conditions, to reduce stigma and  
5 social distance, and to increase the understanding of the impact of poor mental health on  
6 perceived efficiency and presenteeism. In this sense, the intervention programme relies on  
7 education and indirect contact through video segments, which have proven to be the most  
8 effective in dealing with stigma.

9         With the purpose of evaluating the efficacy of the *Headtorch WORKS* intervention in  
10 the workplace, a number of psychological measures were developed and adapted for a  
11 workplace context. These measures examined the topics of social distance, interaction,  
12 stigma, empathy and presenteeism. The measures included participants' views of characters  
13 depicted in vignettes, and assessed intended behaviour towards the individuals depicted in the  
14 vignettes. The study took the form of a pre/post design, where individuals were tested before  
15 and after the *Headtorch WORKS* intervention. The intervention was carried out in a small  
16 number of UK companies over a period of several weeks. The efficacy of the intervention  
17 was assessed by means of the change in the scores between the experimental group and the  
18 control group.

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## Methods

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### Participants

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A total of 191 employees from 11 participating companies entered into the study. Out  
of this total, 57 employees from 6 companies completed the entire study. Data from the 134  
participants who completed the measures only at the first timepoint prior to the intervention

1 were used to analyse the psychometric properties of the measures. As the study took place in  
2 participants' places of work, no demographic information was collected from the participants  
3 due to the sensitive nature of the data provided about mental health. Of the 57 employees  
4 who completed the study, 31 were part of the control group and 26 were in the experimental  
5 condition. However, two participants from the control group had missing data (>10%) and  
6 were removed from the analysis, leaving the control group with 29 participants.

7         Two factors at the beginning of the study appeared to contribute to the large number  
8 of employees who completed the measures only at the first, pre-intervention timepoint. The  
9 first was technical issues with the software, resulting in both control and experimental  
10 participants being unable to progress with the study. The second was restricted to  
11 experimental participants who were not adequately directed to the concluding post-  
12 intervention test. This led to a smaller number of experimental participants, which was  
13 addressed by an emphasis on recruiting experimental participants at the end of the  
14 experiment. The final distribution of experimental and control participants can be seen in  
15 Appendix A, Section 1. To check for differences in the dropout rate between the  
16 experimental and control groups, we firstly ran a cross-tabulation Chi-square test with group  
17 (experimental/control) and inclusion (used for psychometric analysis/ included in the final  
18 experiment) as the two variables. There was a significant association between group and  
19 inclusion –  $X^2(1) = 12.503, p < .001$ . The post-hoc, which directly looked at the difference in  
20 the dropout between the experimental and control groups, showed that there was not a  
21 significant difference between the two groups –  $X^2(1) = 3.7314, p = 0.053$ ].

22         Of the 134 employee participants who only completed the pre-intervention  
23 measurement and were used for validation to assess psychometric properties, four were  
24 excluded. One participant was excluded based on missing data (>10%) and two were  
25 excluded because they consistently provided the same response for more than 65% of the

1 questions. One final participant was removed due to invalid data. Finally, before beginning  
2 the employee study, a pilot study of 122 undergraduate students was undertaken to evaluate  
3 the psychometric properties of the measurements. Ethics approval for the study was provided  
4 by the ethics committee of the College of Science and Engineering, University of Glasgow.

### 5 **Measures**

6 A set of online measures were used to investigate the effectiveness of the  
7 intervention. The measures for the main study with employees used Likert scales as described  
8 below. For the pilot study with students, a slider scale was used with the same anchor points.

9 **Social Distance Scale.** The social distance scale was adapted from Bogardus (1933)  
10 and comprised five questions, relating to the amount of social distance people would put  
11 between themselves and a person whose description they were given in a vignette (see  
12 below). A seven-point Likert scale ranging from “Definitely unwilling” to “Definitely  
13 willing” was used. Scores for the five questions were averaged to attain a composite social  
14 distance scale.

15 **Interaction Scale.** The interaction scale was designed to estimate a participant’s  
16 willingness to interact with people displaying signs of distress. It comprised eight items,  
17 aimed at measuring three aspects of interaction, which were: flexibility in terms of making  
18 adjustments to accommodate a person, confidence in how to interact with a person, and  
19 willingness to interact with a person. To obtain an overall interaction score, we calculated the  
20 average of the eight items.

21 The attitudes towards flexibility shown to people with symptoms of mental health  
22 distress was assessed with 3 questions, which addressed the flexibility in working hours the  
23 participant would give to a person with symptoms of distress. A seven-point Likert scale

1 ranged from “Completely Disagree” to “Completely Agree”, and the total score was  
2 calculated by averaging the scores on all three questions.

3 A confidence measure was adapted from Jorm et al. (2010). It included three  
4 questions addressing the confidence of the participant in helping a person in distress, and  
5 their confidence in disclosing a similar condition. Responses were given on a seven-point  
6 Likert scale, ranging from “Not at all” to “Extremely”.

7 Two questions addressed the willingness of the participants to engage with the person  
8 described to them, and the confidence people would have in discussing their experience if  
9 they were dealing with the same symptoms. Both required an answer on a seven-point Likert  
10 scale, ranging from “Not at all” to “Extremely”.

11 **Basic Empathy Scale.** The Basic Empathy Scale (BES) was adapted from Jolliffe  
12 and Farrington (2006a). The scale comprised 20 questions addressing the cognitive and  
13 affective empathy of the participant. The questions were adapted so that they referred to the  
14 workplace environment. Eight of the questions were reverse scored. Responses were given on  
15 a seven-point Likert scale, ranging from “Strongly Disagree” to “Strongly Agree”.

16 **Stigma scale.** The Stigma scale was adapted from King et al. (2007). The original  
17 scale was created to measure the stigma individuals experience. However, since we were not  
18 investigating a population with mental health issues, the scale was adjusted so that stigma  
19 was assessed from an external perspective. Eleven questions were chosen from the original  
20 scale, and were adapted to refer to the workplace environment. Four questions were reverse  
21 scored. Responses were given on a seven-point Likert scale, ranging from “Not at all” to  
22 “Extremely”.

23 **Presenteeism.** The Presenteeism items were adapted from Sanderson, Tilse,  
24 Nicholson, Oldenburg and Graves (2007). Unlike Kessler et al.’s (2003) Health and Work

1 performance scale, which assesses presenteeism behaviour retrospectively, this presenteeism  
2 scale assesses employees' prospective perceptions and beliefs of how attending work with  
3 poor mental health/well-being would affect them. The questionnaire included items about  
4 likelihood to work (2 questions) which asked participants about attending work if they were  
5 experiencing poor mental health; and efficiency (3 questions), which asked participants how  
6 efficient they believed they would be if they attended work. The likelihood responses were  
7 given on a seven-point Likert scale ranging from "Extremely likely" to "Extremely unlikely".  
8 The responses for the Efficiency scale were collected on a seven-point Likert scale, ranging  
9 from "Not Very Efficient" to "Very Efficient".

10 **PHQ-4.** The PHQ-4 (Kroenke, Spitzer, Williams, & Lowe, 2009) comprises 4  
11 questions that intend to find out whether participants could be diagnosed with depression or  
12 anxiety. Participants responded on a 1 to 4 scale and were allowed to choose 0 if they decided  
13 not to respond to the question, in which case their answer was treated as missing. The PHQ-4  
14 was used not to assess the effectiveness of the intervention, but rather to confirm that the  
15 psychological state of the experimental and control groups did not change between pre-  
16 intervention and post-intervention data collection.

### 17 **Intervention**

18 The *Headtorch WORKS* intervention consisted of a total of three online episodes  
19 comprising original filmed drama and specialist documentary, intercut with a variety of open  
20 and closed questions. The participants followed the story of Matt, an employee who has a  
21 mental health condition, and who is experiencing a variety of unhelpful attitudes and  
22 behaviours from his colleagues, which results in increased stress. A narrator guided the  
23 participants through the programme. Both worst and best practices were portrayed, the latter  
24 revealing the ideal approach in how best to support Matt. The length of the video segments  
25 within each episode varied between 2 and 10 min. After each segment, the participants

1 answered several open-ended questions about what they had observed. During the  
2 intervention, participants were also introduced to the mental health continuum as described  
3 by Keyes (2002), focusing on the effects that wellbeing can have on mental health and vice-  
4 versa. Participants used the continuum to help them estimate the mental health state and/or  
5 well-being of the characters in the drama. Each episode lasted around an hour, depending on  
6 how long the participants took to respond to the open-ended questions.

7         After each episode, participants took part in a discussion with a group of between 3 to  
8 6 people, where they discussed their thoughts on the episode and how the attitude and  
9 behaviours observed in the drama compared to the ones in their workplace. Each participant  
10 was provided with a pack containing discussion points and space for notes. The discussions  
11 were set to run for roughly one hour. Thus, the length of all three episodes along with the  
12 discussions added up to six hours.

13         At the end of the intervention, participants were allowed to take away a copy of the  
14 notes they had made online during participation, and they were awarded a certificate of  
15 completion.

## 16         **Procedure**

17         From each organisation, participants were assigned to either the experimental or the  
18 control condition. Both groups completed a survey comprising the measures described above  
19 in the following order: Half-Day ratio scale<sup>1</sup>, Social Distance scale, Flexibility scale,  
20 Confidence scale, adapted BES scale, adapted Stigma scale, Presenteeism questions and  
21 PHQ-4. Two vignettes were presented - one describing a person (Jane) having unnamed  
22 depression and how that affects her work, and one describing a person (Paul) having

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<sup>1</sup> The Half-day ratio was a series of questions about how many days off a person could have when they have a variety of different needs for flexible working. However, this proved difficult to analyse due to participants' varied interpretations of the questions, so we decided not to analyse these questions further.



1 unnamed anxiety and how that affects his work. The questions from the Social Distance,  
2 Flexibility and Confidence scales were presented twice in a session – once when the  
3 Depression vignette was presented and a second time when the Anxiety vignette was  
4 presented. The Half-day ratio scale, adjusted BES and Stigma scales and the PHQ-4 were  
5 presented only once in a session. This set of questions will from here on be called the pre-  
6 intervention session. After the pre-intervention session, the employees in the experimental  
7 group took part in the full intervention as described in the Intervention section. Each  
8 company had between six and nine weeks for the employees to complete the full intervention.  
9 The employees were asked to complete one online episode and one discussion session every  
10 three weeks. Scheduling of the testing intervals was left up to the participating companies.  
11 After the completion of the intervention, we presented the survey in the same order as before  
12 the intervention. This will hence be termed the post-intervention session.

13         Participants in the control group completed the pre-intervention and post-intervention  
14 sessions without taking part in the intervention, but with a break of six weeks in-between.  
15 The employees in this group started the intervention after the post-intervention session.

16         Although the PHQ-4 required an answer on a 4-point scale (1-4), participants were  
17 allowed to not respond to the questions of the PHQ-4 by selecting 0. For all other measures,  
18 the participants used a seven-point Likert scale to answer the questions. All questions were  
19 presented one at a time.

## 20         **Statistical analysis**

21         To validate the measures, we used the data from the validation sample from the  
22 workplaces as well as the student pilot study. We calculated the psychometric properties for  
23 each of the measures. We then conducted exploratory factor analysis for the measures that  
24 we developed and confirmatory factor analysis for the Basic Empathy Scale, to confirm that

1 the sub-scales for cognitive and affective empathy did not overlap in our data. These analyses  
2 were done using SPSS (v25.0) (IBM Corp, 2017).

3 To evaluate the pre/post-intervention we compared the intervention group and the  
4 control group. Individual questions were averaged for each of the scales for each individual  
5 and a difference score was calculated (pre-intervention subtracted from post-intervention) to  
6 analyse the change in the attitudes of the individuals between the first and the second testing  
7 session. We focus on difference scores as they take into account individual variation, thus,  
8 providing greater statistical power (Jamieson, 2011). Their use also allows us to use a simpler  
9 analysis design, providing more straightforward interpretation (Jamieson, 2011). In this sense  
10 a score of 0 would indicate no difference between the two testing sessions, a positive score  
11 would indicate a higher score in the post-intervention session and a negative score would  
12 indicate a lower score in the post-intervention session. These change scores were compared  
13 between the control and the experimental group using a multiple 20% trimmed mean Yuen's  
14 t-test from the R package DescTools (Signorell et al., 2018). The Yuen's t-test with 20%  
15 trimmed means was chosen as it is considered to be appropriate when there are small and  
16 unequal sample sizes (Wilcox, 2012). Additionally, to confirm that the changes in the  
17 experimental group were significantly different from zero for every significant group  
18 difference, we compared the experimental group's change score to zero using a multiple 20%  
19 trimmed mean t-test. To correct for multiple comparisons, a new adjusted p-value was used,  
20 calculated using Sidak adjustment  $(1 - (1 - \alpha)^{1/m})$ , where  $m$  is the number of tests). The  
21 final number of tests run for this analysis was  $m = 11$ , thus, our adjusted alpha level was  
22 0.0047. Results' significance will be reported with reference to this adjusted p-value. Effect  
23 sizes for the two-sample Yuen's t-tests represent a robust version of Cohen's  $d$  proposed by  
24 Algina, Keselman, and Penfield (2005), using the WRS2 R package (Mair & Wilcox, 2019).  
25 To our knowledge there are no available methods for calculating the effect size for a one-

1 sample Yuen's t-test. For this reason, we have provided the trimmed mean (Mt) alongside its  
2 95% confidence intervals. Reliability of each scale was assessed using Cronbach's alpha for  
3 the pre- and post- intervention session combining the experimental and control groups  
4 together. Cronbach's alpha was calculated utilising the psy package (Falissard, 2012). These  
5 analyses were performed using R (v.3.6.0) (R Core Team, 2019) and RStudio (v 1.2.1335)  
6 (RStudio Team, 2016). Finally, individual participants were removed from the dataset, if they  
7 had more than 10% missing data points (N=2). For an alternative analysis using mixed design  
8 ANOVAs see Appendix A, Section 2. The results of this analysis reveal the same patterns as  
9 the main analysis reported above.

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### Results

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The average score for each of the different measures was calculated for each group for the pre-intervention and post-intervention sessions. These results can be seen in Table 1, and change scores between the two sessions for each group can be seen in Figure 1. Pearson correlations for each scale between the pre-intervention and post-intervention session are shown in Table 2. There was no obvious clustering based on the organisations from which the participants were recruited (Figure 2).

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**PHQ-4.** The PHQ-4 was used to assess whether the participants' state of anxiety or depression changed between pre-intervention and post-intervention. This was done for all participants together. Three participants, all from the experimental group, chose not to disclose and they were removed from this analysis - three had declined to disclose on the anxiety subscale and one on the depression subscale. The results did not show a significant difference from zero between the pre-intervention and the post-intervention for anxiety:  $t(31)$

1 = -1.208,  $p = 0.236$  (trimmed mean = -0.125 [95%CIs: -0.336:0.086]); or for depression:  
2  $t(31) = 0.410$ ,  $p = 0.685$  (trimmed mean = 0.031 [95%Cis: -0.124:0.187]). This indicates that  
3 the other experimental results would not have been influenced by systematic changes in the  
4 participants' state of anxiety or depression. Cronbach's alpha showed reliability of 0.908 for  
5 the pre-intervention session and 0.957 for the post-intervention session.

6       **Social Distance.** In the two validation groups the social distance scale had  
7 Cronbach's alpha of .931 (students) and .946 (employees); Guttman's Lambda6 of .966 and  
8 .972; and split-half reliability Spearman-Brown coefficient of .884 and .902. Factor analysis  
9 revealed a single factor explained 62.27% and 67.55% of variance in the respective samples  
10 with KMO scores of .76 and .832. A two-factor solution would account for 75.05% and  
11 77.57% of the variance with two subsets of items. For the student participants one sub-scale  
12 had friend-related items and one had work-related items, however for the workplace-based  
13 sample, items did not align in this way. Given the uncertainty related to the factor structure  
14 across different groups, we decided to retain the single factor solution for the analysis in our  
15 experiment.

16       Social distance was averaged across the anxiety and depression vignettes to create a  
17 Social Distance score. We performed a Yuen's t-test with 20% trim (trimmed mean of 0.319  
18 for the experimental group and -0.263 for the control group) to examine whether the change  
19 in Social Distance was different between experimental and control groups. Results showed  
20 the pre/post-intervention change was significantly different between the two groups  
21 ( $t(26.083) = 3.335$ ,  $p = .003$ ,  $\delta t = 0.932$ ). An additional test of whether the change in the  
22 experimental group was significantly different from zero using a Yuen's trimmed mean t-test  
23 showed a non-significant difference ( $t(15) = 2.139$ ,  $p = .049$ ,  $Mt = 0.319$  [0.001:0.636]).  
24 Cronbach's alpha showed reliability of 0.953 for the pre-intervention session and 0.972 for  
25 the post-intervention session.

1           **Interaction.** We examined psychometric properties for the scale and found that for  
2 the two samples it had Cronbach's alpha of .841 (students) and .879 (employees); Guttman's  
3 Lambda6 of .923 and .955; and split-half reliability Spearman-Brown coefficient of .852 and  
4 .913. Factor analysis did not reveal a single factor, but instead multiple factors, however we  
5 had KMO scores of .682 and .744, and 5-factor solutions accounted for 61.81% and 71.01%  
6 of variance respectively. Between the two groups of participants, it was difficult to identify  
7 stable sub-scales, and so we decided to retain a composite score, as sub-scales of the data had  
8 poorer reliability than the composite.

9           The composite score of the familiarity score, flexibility score, confidence score and  
10 willingness score was also averaged over the two vignettes into an Interaction score. We  
11 performed a Yuen's t-test with 20% trim (trimmed mean of 0.611 for the experimental group  
12 and -0.050 for the control group) to examine whether the change in Interaction score was  
13 different between experimental and control groups. Results showed that the pre/post-  
14 intervention change was significantly different between the two groups ( $t(27.181) = 4.691, p$   
15  $< .001, \delta t = 1.274$ ). An additional test of whether the change in the experimental group was  
16 significantly different from zero using a Yuen's trimmed mean t-test showed a significant  
17 difference ( $t(15) = 5.170, p < .001, M_t = 0.611 [0.359:0.862]$ ). Cronbach's alpha showed  
18 reliability of 0.872 for the pre-intervention session and 0.936 for the post-intervention  
19 session.

20           **Stigma.** Psychometric properties for the adapted stigma scale were better in the  
21 student sample than in the employee sample [Cronbach's alpha of .838 and .521; Spearman-  
22 Brown = .69 and .329; Guttman's Lambda = .907 and .638].

23           We performed a Yuen's t-test with 20% trim (trimmed mean of -0.255 for the  
24 experimental group and -0.077 for the control group) to examine whether the pre/post-  
25 intervention change in stigma score was significantly different between the experimental and

1 control groups. Results showed that the change was not significantly different between the  
2 two groups ( $t(33) = -1.333, p = .192, \delta t = -0.353$ ). Due to the lack of a significant group  
3 difference, subsequent analyses were not performed. Additionally, Cronbach's alpha showed  
4 low reliabilities of 0.441 for the pre-intervention session and 0.233 for the post-intervention  
5 session, mirroring the reliability measures from the validation.

6 **Basic Empathy Scale.** Whilst our student sample showed poor psychometric  
7 properties (Cronbach's alpha = .288, split half reliability = .095 and Guttman's Lambda6 =  
8 .588), the employee sample showed better psychometric properties, with Cronbach's alpha =  
9 .748, Spearman-Brown = .787 and Guttman's Lambda6 = .826. Factor analysis showed a 4-  
10 factor solution that accounted for 54.83% of the variance, with KMO = .778. While the  
11 factors did not split into two as expected, they showed no overlap between cognitive and  
12 affective items. These scores were hence separated into these two components – a cognitive  
13 component and an affective component.

14 **Cognitive.** We performed a Yuen's t-test with 20% trim (trimmed mean of 0.153 for  
15 the experimental group and -0.240 for the control group) to examine whether the change in  
16 Cognitive Empathy score was different between experimental and control groups. Results  
17 showed the pre/post-intervention change was not, at the adjusted alpha level of 0.0047,  
18 significantly different between the two groups ( $t(27.148) = 2.573, p = .016, \delta t = 0.712$ ). An  
19 additional test of whether the change in the experimental group was significantly different  
20 from zero using a Yuen's trimmed mean t-test showed no significant difference ( $t(15) =$   
21  $1.194, p = .251, M_t = 0.153 [-0.120:0.426]$ ). Cronbach's alpha showed reliability of 0.750 for  
22 the pre-intervention session and 0.833 for the post-intervention session.

23 **Affective.** We performed a Yuen's t-test with 20% trim (trimmed mean of -0.108 for  
24 the experimental group and 0.083 for the control group) to examine whether the pre/post-  
25 intervention change in affective empathy score was significantly different between the

1 experimental and control groups. The results showed that the change was not significantly  
2 different between the two groups  $t(32.668) = -1.356, p = .185, \delta t = -0.351$ ). Due to the lack  
3 of a significant group difference, subsequent analyses were not performed. Cronbach's alpha  
4 showed reliability of 0.705 for the pre-intervention session and 0.807 for the post-  
5 intervention session.

6 **Presenteeism.** These results were separated into two components – one component  
7 indicating the likelihood of going to work when experiencing poor mental health, and another  
8 component indicating the predicted efficiency when attending work when experiencing poor  
9 mental health.

10 **Likely to go to work.** We performed a Yuen's t-test with 20% trim (trimmed mean of  
11 -0.313 for the experimental group and -0.053 for the control group) to examine whether the  
12 pre/post-intervention change in likelihood to go to work score was significantly different  
13 between the experimental and control groups. The results showed that the change was not  
14 significantly different between the two groups ( $t(18.542) = -0.901, p = .375, \delta t = -0.242$ ).  
15 Due to the lack of a significant group difference, subsequent analyses were not performed.  
16 Cronbach's alpha showed reliability of 0.833 for the pre-intervention session and 0.982 for  
17 the post-intervention session.

18 **Efficiency.** We performed a Yuen's t-test with 20% trim (trimmed mean of -0.188 for  
19 the experimental group and 0.114 for the control group) to examine whether the pre/ post-  
20 intervention change in Efficiency score was significantly different between the experimental  
21 and control groups. The results showed that the change was not significantly different  
22 between the two groups ( $t(21.532) = -1.082, p = 0.291, \delta t = -0.303$ ). Due to the lack of a  
23 significant group difference, subsequent analyses were not performed. Cronbach's alpha  
24 showed reliability of 0.935 for the pre-intervention session and 0.983 for the post-  
25 intervention session.





1 difference was significant at the conventional significance level of  $p < 0.05$ , but not when  
2 correction for multiple comparisons was performed. There was no increase in affective  
3 empathy. While affective empathy refers to an immediate emotional reaction, it can  
4 potentially be overturned by cognitive aspects, such as the ability to understand and  
5 empathise with others' feelings. More importantly, the intervention was targeting social  
6 inclusion and the building of relationships, which is related to cognitive empathy. It is,  
7 therefore, reasonable to expect that cognitive empathy would be affected more than affective  
8 empathy (Ang & Goh, 2010). Moreover, both education-based and contact strategies for  
9 tackling stigma tend to have very small effects on affect (Corrigan et al., 2012). Therefore, it  
10 is not surprising that affective empathy was not significantly affected.

11         Since increased empathy is related to improvement of interpersonal relationships, the  
12 improvement in social distance and interaction measures, as well as possibly a small effect on  
13 cognitive empathy, indicate that the intervention changed people's attitudes and behavioural  
14 intentions, making them more positive. As social relationships are important for positive  
15 well-being and job satisfaction, these changes would likely improve the well-being of  
16 individuals with poor mental health. Understanding and acceptance have been emphasised by  
17 managers to be important strategies in dealing with stigma in the workplace (Corbière et al.,  
18 2012) and our results provide evidence that these factors are addressed by the *Headtorch*  
19 *WORKS* intervention.

20         The *Headtorch WORKS* intervention performs comparably to the 'Mental Health First  
21 Aid' training course by Kitchener & Jorm (2004). The 'Mental Health First Aid' training  
22 course similarly shows improvement in social distance and interaction-focused measures,  
23 although to a lesser extent when applied to schoolteachers (Kitchener & Jorm, 2004).  
24 However, it is impossible to directly compare the two interventions since they use different  
25 measurement scales. For example, the 'Mental Health First Aid' course did not measure

1 empathy, and their scales for the other measures had different ranges. The *Headtorch*  
2 *WORKS* intervention differs with the addition of pseudo contact through video episodes  
3 depicting individuals with mental health problems. On the other hand, the ‘Mental Health  
4 First Aid’ course relies solely on education, and the most consistent improvements they  
5 found were in fact in knowledge and behaviour (Hanisch et al., 2016), which should be  
6 expected following Corrigan et al.’s meta-analysis (2012). Thus, both these interventions  
7 have merit in improving behavioural intentions and attitudes, with the main difference being  
8 the evidence, though limited, for improvement in cognitive empathy in *Headtorch WORKS*.

9         The *Headtorch WORKS* intervention did not have an effect on our measure of stigma.  
10 It allowed the participants to develop a greater understanding and acceptance of individuals  
11 with poor mental health through video depiction of interactions with a person that displays  
12 signs of psychological distress and cognitive engagement in helping that person. However,  
13 the stigma questionnaire used in this evaluation required a more general reflection about poor  
14 mental health, which represents only one aspect of this multifaceted construct. At the time of  
15 conducting the literature review for this evaluation, King et al.’s (2007) scale seemed the  
16 most appropriate for adapting to our task and, as the factor analysis shows, for the pilot  
17 participants it retained good properties. However, this was not the case for the work-based  
18 sample, so it is unclear whether this measure is sensitive enough to capture improvement in  
19 stigma in the workplace. As Couture and Penn (2003, 2006) pointed out, exposure to  
20 individuals with mental health issues can be effective in reducing stigma. Since the  
21 intervention showed a significant improvement in social distance and interaction in the  
22 experimental group, we can expect recipients of the intervention to engage more with  
23 individuals experiencing poor mental health and hence gain exposure which would  
24 potentially reduce stereotypes. As we were not able to measure this in the current study, we

1 propose that measuring self-directed exposure to individuals with poor mental health after a  
2 training intervention would allow for a more nuanced analysis of reduction in stigma.

3         The format of the *Headtorch WORKS* intervention relied on both education on the  
4 topic of mental health and well-being, and contact with individuals with mental health  
5 problems through video episodes. Thus, the present findings are not surprising as these two  
6 strategies for battling stigma are known to impact upon attitudes and behavioural intentions.  
7 Moreover, due to the likely age of our sample (adults as opposed to adolescents), the  
8 intergroup contact (although indirect through video) potentially had a larger effect on the  
9 employees' attitudes than on increased knowledge. In fact, intergroup contact theory argues  
10 specifically that changes in stigma and prejudice are largely mediated by anxiety reduction  
11 about intergroup contact and improvement in empathy and perspective taking (Pettigrew &  
12 Tropp, 2008; Pettigrew et al., 2011). The lack of effect specifically on the stigma scale,  
13 however, could reflect the fact that the contact with individuals with mental health was  
14 through video episodes rather than in-person. As contact in-person tends to produce larger  
15 effects on stigma in both attitudes and behavioural intentions in randomised-control trials, it  
16 is possible that the video episodes were not sufficient (Corrigan et al., 2012). Nevertheless, as  
17 stated before, the improvement in the social distancing scale could lead to an increase in  
18 exposure, which could in turn decrease stigma through the effects of 'mere exposure'  
19 (Pettigrew et al., 2011).

20         Finally, with respect to the individuals' understanding of the effects that mental health  
21 has on their own work efficiency, our results showed that even though individuals were  
22 aware that their productivity would suffer, the participants were still as likely to attend work  
23 as they were before the intervention. One possible explanation of these results could be the  
24 culture of stigma in the workplace. This is observed by the findings of Stevenson and Farmer  
25 (2017), who found that only a small number of people are willing to discuss poor mental

1 health with their line managers. They also discuss the need for strategy, policies and training,  
2 and observe that it is not surprising that the change in company policies to accommodate  
3 mental health has been slow (Brohan et al., 2012; Stevenson & Farmar, 2017). This is an  
4 important future step, as over-commitment and job-demand can lead to anxiety and  
5 depression (Mark & Smith, 2012). Moreover, acknowledging reduced productivity without  
6 reducing presenteeism will not lead to a reduction in the cost of presenteeism (Parsonage &  
7 Saini, 2017). For this to be achieved, Stevenson and Farmer (2017) recommend that it is vital  
8 for the workplace to raise awareness and understanding through education about mental  
9 health and well-being. Although education on its own has a lesser effect than contact with  
10 individuals with poor mental health, these types of interventions have a much more  
11 widespread feasibility, making them central to workplace policies on mental health. As  
12 shown in the present intervention evaluation, however, indirect contact through video  
13 episodes can be used to boost some of the effects from education-only interventions.

14 As much as these results are promising, there are several limitations to consider in  
15 combination with the findings. Firstly, due to privacy measures, we are missing important  
16 demographic data about our sample. This limits the generalisability of the findings. A further  
17 factor is that the period in which participants completed the study varied between six and  
18 nine weeks. Whereas that could have introduced some additional variability, that variability  
19 might have only reduced the effects that we have observed here. Another factor that could  
20 have affected our results here is the use of difference scores. Although the use of difference  
21 scores can mask variability within participants, we observed the same results with an  
22 alternative analysis procedure, as seen in Appendix A, and hence the use of difference scores  
23 could not have contributed to the findings. Moreover, considering that the present sample is  
24 on the smaller side, the use of difference scores here allowed us to run a smaller number of  
25 comparisons and reduce the resultant risk of type 2 errors. Our psychometric analyses of the

1 various measures generally showed consistency within the individual student and employee  
2 samples. However, there were occasional differences in the psychometric properties between  
3 the student and employee groups, which could be explained by the fact that the test items  
4 generally probed attitudes in the context of workplace scenarios. This is mostly relevant for  
5 the Basic Empathy and stigma scales. Our workplace-adapted Basic Empathy Scale showed  
6 poor performance in the student group, suggesting that our adaptation of the scale to the  
7 workplace limits its applicability. Additionally, King et al.' (2007) stigma scale showed poor  
8 psychometric properties in all employee samples which limits the conclusions we are able to  
9 draw from this measure of stigma.

10 Future research could consider a delay control group design, in order to increase the  
11 number of participants. However, a delay control group design is more appropriate when the  
12 intervention can be administered over an extended period, as in drug trials, tracking changes  
13 in both groups across the two time periods. Thus, a modification to this design would be  
14 necessary. For example, future research could apply the measures at 3 separate time points –  
15 first at the beginning, second at the mid-point of the study (when the experimental group  
16 would be halfway through the episodes of the intervention and before the control group  
17 begins the intervention), and finally once after both groups have concluded all episodes. This,  
18 however, runs the risk of the participants picking up on what the researchers are looking for  
19 within the measures, due to their repetitiveness. An alternative to this would be for the  
20 experimental group to conclude with the intervention, and then fill in the questionnaires a  
21 third time, as a follow-up, after the control group have also finished the intervention. Both  
22 alternatives would provide further information about the strength of the effects found in the  
23 current study, and we encourage future researchers to attempt applying these designs.

24 In conclusion, although our understanding would benefit from a study over longer  
25 time frames and additional work populations, the current evidence supports *Headtorch*

1 *WORKS* as a successful employee intervention for reducing social distance with individuals  
2 experiencing poor mental health, and promoting interaction through factors such as increased  
3 confidence in supporting co-workers with mental health problems. Our evidence for  
4 improved cognitive empathy was not conclusive, and we were not able to measure  
5 improvement on the King et al. (2007) stigma scale, however the improvements in the social  
6 distance and interaction would suggest improvements in the relationships between co-  
7 workers, leading to positive interactions and reduced stigma. Improved relationships can also  
8 help to alleviate feelings of self-stigma, and improve job satisfaction and well-being, so the  
9 intervention could further be a vehicle in minimising negative experiences associated with  
10 mental health conditions in the workplace.

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1 Table 1

2 *Mean and standard deviations for each group for the pre- and post-intervention sessions*

Group	Session	Social	Interac	Stig	Cogniti	Affecti	Likely	Efficien							
		Distance * D	tion *+ D	ma D	ve Empathy D	ve Empathy D	to go to work D	cy D							
Experimental (n=26)	Pre-	.52	.06	.03	.13	.79	.41	.40	.46	.69	.64	.5	.83	.74	.38
	Post-	.87	.93	.79	.13	.66	.31	.58	.59	.6	.87	.87	.60	.53	.35
Control (n=29)	Pre-	.59	.00	.26	.37	.52	.48	.6	.61	.18	.73	.28	.37	.9	.33
	Post-	.42	.18	.01	.54	.54	.48	.37	.69	.25	.92	.22	.26	.99	.41

- 1 Note: \* indicates significant difference for indicated scale between the two groups and pre/post-intervention sessions at the adjusted alpha level -
- 2  $p < 0.0047$ ; + indicates a significant change between pre/post intervention sessions for the experimental group at the adjusted alpha level -
- 3  $p < 0.0047$ .





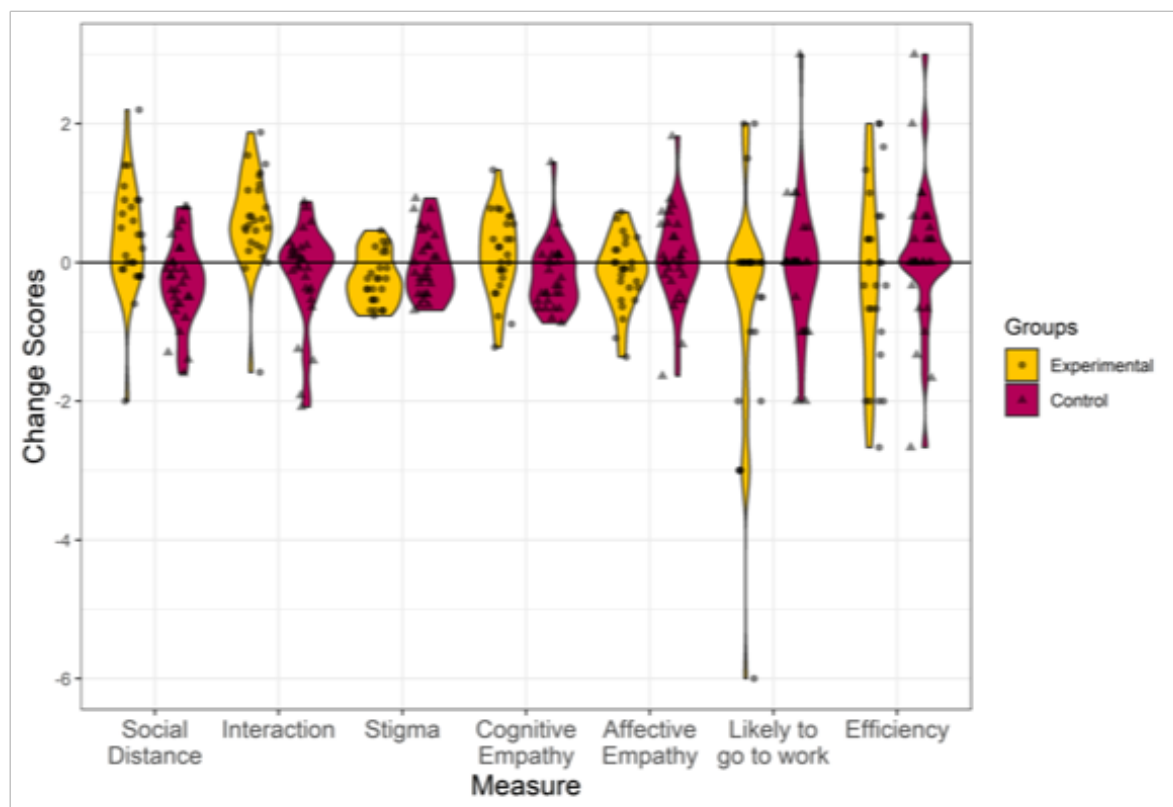


Figure 1. Change scores between the pre- and post-intervention sessions for each group.

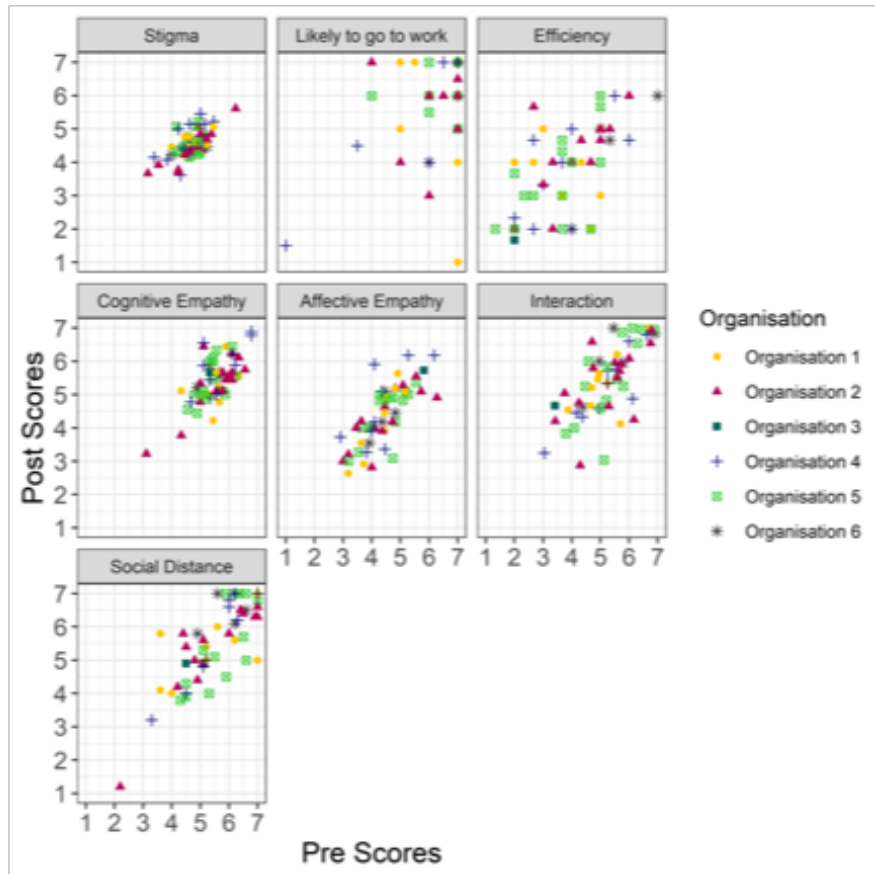


Figure 2. Distribution of pre/post-intervention session responses from each organisation for each scale.