Employee Wellbeing: Evaluating The Wellbeing Game in Two Settings

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Abstract

Increasing employee wellbeing has many benefits for the organisation, however, many organisational wellbeing interventions focus more on decreasing stress and less on increasing wellbeing. This research used two studies to evaluate whether The Wellbeing Game is an effective wellbeing intervention in both a non-organisational and an organisational setting. Study 1 investigated the efficacy of The Wellbeing Game in a non-organisational setting. Participants were 60 students (44 female, 16 male) from the University of Canterbury with a mean age of 21.48 years. The experimental group played The Wellbeing Game for one week whereas the control group did not. All participants completed pre and post-test measures of wellbeing and stress and an image valence perception task at the beginning and end of the week. This study found that The Wellbeing Game significantly increased wellbeing, but did not decrease stress or change perceptions of image valence. Study 2 evaluated The Wellbeing Game in an organisational context. The 52 participants from a New Zealand financial organisation played The Wellbeing Game for one month. Wellbeing and stress were measured at the beginning and end of the one month period. The results showed that The Wellbeing Game significantly reduced stress and wellbeing was increased when employees felt that it helped them to connect more with others. However The Wellbeing Game did not contribute to improved organisational attitudes. Regardless, this research indicates that The Wellbeing Game is an effective wellbeing intervention in both an organisation and a non-organisational context.

Employee Wellbeing: Evaluating The Wellbeing Game in Two Contexts

The nature of the workplace has changed over the past several decades (Allvin, 2008). The developed world is now, to a large extent, driven by the knowledge economy (Powell & Snellman, 2004). This economy is reliant on jobs which focus on technology and information production. In this knowledge economy, employees possess specialised skillsets which are difficult to replace (Hellgren, Sverke, & Näswall, 2008), therefore, fostering and retaining these employees is important for organisational success. This can be achieved through the development of employee wellbeing (Dewe & Cooper, 2012).

Wellbeing is comprised of two key elements: feeling good and functioning well in life pursuits (Aked, Marks, Cordon, & Thompson, 2009). The typical person spends one quater of their adult life at work, thus work is a key life pursuit. Feeling good and functioning well at work are therefore key components of a person's overall wellbeing.

Workplaces are one of the most effective settings for promoting wellbeing because they provide access to a large portion of society (Russell, 2009). Conveniently, workplaces have much to gain by promoting wellbeing (Hone, Jarden, Duncan, & Schofield, 2015). Experiencing a high level of wellbeing, a state referred to as flourishing (Hone, Jarden, Schofield, & Duncan, 2014), is associated with a range of positive organisational attitudes. These include superior work performance (Lyubomirsky, King, & Diener, 2005), low turnover intentions, low actual turnover (Boehm & Lyubomirsky, 2008), greater effort and thought put into work, less absenteeism and fewer work related injuries (Keyes & Grzywacz, 2005). Given that work can affect wellbeing, and that wellbeing is important for organisational success, it is in an organisation's best interests to promote wellbeing at work.

Despite the many positive organisational attitudes associated with employee flourishing, organisations have traditionally focused on reducing employee stress rather than increasing employee wellbeing (Luthans, 2002). Stress occurs when there is a perceived imbalance

between personal resources and perceived demands in a given situation (Hellgren et al., 2008). 18.2% of New Zealanders report work stress as problem (Statistics NZ, 2012) and 43% of all days absent from work are due to stress (HSE, 2015). Thus, because stress is linked to decreased productivity and therefore reduced profit (Johnson et al., 2005), organisations have focused on implementing stress reduction interventions (Kelloway, Hurrell Jr, & Day, 2008).

Although high stress is one factor associated with experiencing low wellbeing, stress and wellbeing exist in separate, albeit overlapping, dimensions. Just as the absence of mental illness does not equate to mental health (Keyes, 2005), the absence of stress does not equate to wellbeing. Indeed, evidence suggests that flourishing may provide a buffer against the negative effects of stress (Keyes & Grzywacz, 2005). Organisations stand to gain much more from investing in the promotion of employee wellbeing rather than solely focusing on reducing stress (Hone et al., 2015).

Although traditional workplace wellbeing interventions have focused on individual stress management, this focus should instead be placed on increasing employee wellbeing (Danna & Griffin, 1999). Evidence suggests that traditional stress interventions are often ineffective in the long term and do not result in improved organisational attitudes (Noblet & LaMontagne, 2006). Consequently, more effective wellbeing interventions need to be developed.

Recent evidence suggests that an effective way to increase wellbeing is to incorporate five broad actions in our day-to-day lives (Aked et al., 2009). These five actions, aptly named The Five Ways to Wellbeing are to *connect*, *be active*, *take notice*, *keep learning*, and *give*. These actions were selected based on theoretical and empirical evidence, and have been shown to increase the likelihood of flourishing (Hone et al., 2015).

The Mental Health Foundation of New Zealand has developed a tool to increase wellbeing which harnesses The Five Ways to Wellbeing (hereafter referred to as "The Five Ways"). This intervention is called The Wellbeing Game (hereafter referred to as "The Game"). It is assumed that The Game increases wellbeing by altering players' perceptions of their environment, thereby causing players to view life events in a more positive way. If this is so, a combination of mechanisms are involved to achieve this increase in wellbeing, including gamification, the Broaden and Build theory (Fredrickson, 2003), and mindfulness. The present study tests this assumption, and investigates whether The Game can be used in an organisation to increase employee wellbeing, decrease employees stress, and improve several organisational attitudes.

Defining Wellbeing

Wellbeing is commonly construed as happiness (Ryan & Deci, 2001). This view is called the hedonic perspective of wellbeing and emphasises the importance of three components. These are life satisfaction, the presence of positive mood, and the absence of negative mood. Thus, the hedonic perspective promotes the experience of pleasure and absence of displeasure, broadly construed to include all of ones' perceptions of the positive and negative aspects of life (Deiner, Sapyta, & Suh, 1998)

However, the hedonic perspective does not fully explain wellbeing (Ryff & Singer, 1998). Although the goals, attainments, and social activities encouraged by this view may increase pleasure and decrease displeasure, these activities are not necessarily beneficial in the long term. Hedonism is an insufficient definition of wellbeing because happiness is not the only criterion of wellbeing (Ryan & Deci, 2001).

An alternative view, named the eudaimonic perspective views wellbeing as self-actualisation, proposing that true happiness is found in expressing virtue (Dewe & Cooper, 2012). There are six distinct dimensions of human actualisation (Ryff & Keyes, 1995). These are autonomy, personal growth, self-acceptance, life purpose, mastery, and positive

relatedness. Eudemonia is experienced when life activities are aligned with deeply held values. This results in a feeling of being intensely alive and existing as one's true self. In summary, the eudaimonic perspective views engagement in activities which foster human growth essential to wellbeing (Fromm, 1978).

A distinction between these two perspectives of wellbeing has been empirically supported. Waterman (1993) found that although hedonic and eudaimonic behaviours overlap, eudemonia is more associated with personal growth and linked with challenge and effort exertion, whereas hedonism is associated with relaxation and problem avoidance (Waterman, 1993). Thus, eudemonia is associated with personal development, whereas hedonism alone is often associated with enjoyment (Ryan & Deci, 2001).

Evidently, both perspectives of wellbeing appear to be important and empirically supported. Thus, a perspective which consolidates these two views is needed. Recent research has combined the two perspectives and proposes that wellbeing can be viewed as a multidimensional phenomenon that encompasses both eudaimonic and hedonic aspects. Compton, Smith, Cornish, and Qualls (1996) identified two factors important to wellbeing, one that reflects the hedonic perspective and one that reflects the eudaimonic perspective. Additionally, these two factors are themselves correlated, suggesting that hedonism and eudemonism are related but distinct concepts. Further support for the importance of both hedonism and eudemonia is provided by people with no education in psychology identifying both happiness and meaning as important features of a good life (King & Napa, 1998). Consequently, it is clear that experiencing both happiness and meaning are essential to the presence of a high level of wellbeing. Therefore, wellbeing is defined as feeling good (hedonism) and functioning well (eudemonia) (Aked et al., 2009). This definition of wellbeing is used in the present study.

Having defined wellbeing, the relationship between wellbeing and stress must be explained. The absence of stress does not equate to wellbeing, nor does the presence of wellbeing mean the absence of stress. Wellbeing exists separately to the absence of stress. Therefore, although reducing stress is important, investing in wellbeing results in benefits above and beyond those of stress reduction alone (Keyes & Grzywacz, 2005).

Employee Wellbeing

Employee wellbeing is the part of an employee's overall wellbeing that is perceived to be determined primarily by work, and which can be influenced by workplace interventions (Juniper, Bellamy, & White, 2011). The knowledge economy's reliance on mental capability means that fostering wellbeing in employees is more important than previously. Research shows that employees with a high level of wellbeing put greater thought and effort into their work (Keyes & Grzywacz, 2005), a key attribute of the knowledge worker (Powell & Snellman, 2004). Hence, a psychologically healthy worker is a more effective worker (Wright & Cropanzano, 2000).

Furthermore, employee wellbeing is linked to several positive organisational attitudes, including team cohesion, job engagement (Bakker, 2015), and decreased turnover intentions (Hart & Cooper, 2001; Diedericks & Rothmann, 2014). Possessing a high level of wellbeing is positively correlated with job satisfaction which in turn is negatively correlated with turnover intentions (Diedericks & Rothmann, 2014). Additionally, wellbeing is also directly related to turnover; employees with low wellbeing are more likely to leave their jobs (Page & Vella-Brodrick, 2009). Interestingly, an underlying cause of turnover intentions has been found to be a lack of work-related positive affect (Page & Vella-Brodrick, 2009). Employee positive affect, a key component of wellbeing, is negatively correlated with withdrawal intentions ($r = -.38$; Hart & Cooper, 2001). Therefore, increasing wellbeing in employees is vital to increasing employee retention rates.

The job demands-resource model can be used to explain the relationship between wellbeing and both relationships between team members and job engagement (Bakker, 2015). This model characterises workplaces on two categories: job demands and job resources. Job demands are aspects of the job which require energy to overcome, and job resources are aspects of the job which have motivational potential. One important job resource is social support. Job resources can be used to overcome job demands and are likely to result in work engagement and increased performance, whereas job demands result in strain and reduced performance (Bakker & Demerouti, 2007). A reciprocal relationship exists between wellbeing and job resources, as well as between wellbeing and job demands. Wellbeing increases job resources including work engagement, and work engagement increases wellbeing. At the same time, job demands decreases wellbeing, and wellbeing affects the perception of job demands. Thus, when wellbeing is high, job demands are less, requiring fewer resources to overcome them, and job resources are high, which results in job engagement. So it stands than an increase in wellbeing should increase relationships between team members and job engagement (Bakker, 2015).

The link between wellbeing, job engagement, and relationships between team members, offers another reason that increasing employee wellbeing is important for organisational success. This can be achieved by implementing effective organisational wellbeing interventions.

Workplace Wellbeing Interventions

Traditionally, workplace wellbeing interventions have focused on increasing wellbeing by reducing stress in employees (Hone et al., 2014). These interventions work to reduce either stress perceptions or organisational stressors as well as increase employees' ability to cope with stress, and therefore, increase employee wellbeing.

These interventions exist on one of three levels – the primary, secondary, or tertiary level (Hurrell & Murphy, 1996). Primary interventions are focused on the organisation and

aim to reduce or eliminate stressors (Quick, Quick, Nelson, & Hurrell Jr, 1997), secondary interventions are focused on changing an individual's perception of, or reaction to a stressor (Kelloway et al., 2008), and tertiary interventions occur after the fact to treat individuals who have suffered a strain response (Quick et al., 1997).

Primary interventions are thought to be the most effective form of dealing with work stress (Kelloway & Day, 2005). These interventions can be classed as either psychosocial interventions or sociotechnical interventions. Psychosocial interventions aim to reduce stress by changing employee perceptions of the work environment by focusing primarily on human processes and psychosocial aspects of the work setting. Sociotechnical interventions focus primarily on improvements to objective work conditions (Parkes & Sparkes, 1998). Psychosocial interventions include interventions such as identification of potential stressors and plans for their reduction, and the development of teams, job re-design, training, and increased communication. Evidence suggests that these psychosocial interventions are somewhat effective in reducing employee stress (Kelloway et al., 2008). Conversely, sociotechnical interventions focus primarily on changes to objective work conditions. This includes altering the workload, work schedules, and work processes. These interventions have been shown to increase job satisfaction, employee motivation, and reduce job stress (Hurrell, Barling, Kelloway, & Frone, 2005). Although these primary intervention techniques are effective in reducing employee stress, they are not often implemented due to practical restrictions (Kelloway et al., 2008). Thus, although in theory these interventions reduce stress, they are often not implemented due to real world constraints.

Secondary interventions attempt to alter the relationship between stressors and strains by increasing individual ability to cope with stress, or by teaching specific stress-management techniques. Although these interventions are the most common workplace

intervention, they are thought to be less effective as they are often too general, and are often only implemented after stress has occurred (Kelloway et al., 2008).

Health promotion interventions are an example of a secondary intervention. These are common place in organisations, with 90% of mid-sized US companies employing some form of health intervention (Aldana, 2001). These interventions generally aim to achieve one of three goals; to increase awareness of what can be done to reduce the perception of stressors, for example through the use of newsletters or health fairs, to change behaviours, for example step competitions, or to promote a healthy life-style, for example by providing free fruit (Gebhardt & Crump, 1990). Evidence for the effectiveness of these programs is limited. Although companies claim to have reduced costs through these programs, many reviewers have found them to be of limited effectiveness (Cartwright & Cooper, 2005).

Another example of secondary interventions are stress management interventions. These include interventions such as relaxation techniques, cognitive behavioural approaches, educational programs and interpersonal skills training (Cartwright & Cooper, 2005). These techniques are the most popular form of stress management (Kelloway et al., 2008). Evidence shows that the implementation of stress management techniques is effective in reducing individual employee stress, however only in the short term (Noblet & LaMontagne, 2006). Thus, secondary interventions are useful as a short term fix, but in order to provide long term stress reduction, more needs to be done.

Tertiary interventions are different from secondary interventions as although they focus on the individual, this focus is on treating the consequences of job stress as opposed to preventing it (Kelloway et al., 2008). Employee Assistance Programs (EAPs) are the most common form of tertiary intervention. These are employer-funded resources offered to employees and often to their families. The core service offered by an EAP is generally professional assessment, referral, and short-term counselling directed at personal, family and

work-related problems that might interfere with worker performance and health (Kirk & Brown, 2003). These interventions are funded as it is believed that productivity will increase by reducing absenteeism, increasing morale and lowering turnover. In 2001, 92% of Fortune 500 companies provided EAPs. Although evidence suggests that EAPs do indeed reduce stress, given that these evaluations are often conducted by EAP providers and used to advertise their services, the methodological rigour of these studies has been questioned (Kirk & Brown, 2003). Regardless, the utility of EAPs are limited as they are used when a stressful event has already occurred, as opposed to preventing a negative stress response. Despite this, these interventions are important as not all stress can be prevented. However, they should not be used as a sole wellbeing intervention.

Although stress interventions may provide a short-term fix, many do not appear to have a long term effect on individual stress coping, nor on organisational attitudes (Noblet & LaMontagne, 2006). Given that wellbeing is more than just the absence of stress (Keyes & Grzywacz, 2005), and that wellbeing is linked to many positive organisational attitudes (Hone et al., 2015), a shift in the organisational wellbeing interventions used in practice must occur. An effective intervention should focus on promoting wellbeing through an intervention which combines both a primary and secondary level approach (Noblet & LaMontagne, 2006).

Five Ways to Wellbeing

Evidence shows that wellbeing can be increased by engaging in five broad actions in day-to-day life (Aked et al., 2009). These five actions channel the importance of social relationships, physical activity, awareness, learning, and giving. The actions, named The Five Ways to Wellbeing, are to *connect*, *be active*, *take notice*, *keep learning*, and *give*. These actions have been selected for four reasons: they are evidence based, have universal appeal, target the individual, and provide variety in one's daily life (Aked et al., 2009).

Connect. This means connecting with others in each area of life. Developing social connections supports and enriches everyday life as social relationships promote wellbeing

and protect against mental ill health (Umberson, Chen, House, Hopkins, & Slaten, 1996).

Research shows that the most significant difference between those with mental health

problems and those without is social participation (Jenkins, Meltzer, Jones, Brugha, &

Bebbington, 2008). Furthermore, having three or more close relatives or friends is negatively

correlated with having a common mental health disorder (Brugha et al., 2005). Given that

mental health is more than just the absence of mental illness, it is also important to note that

happy people, that is those who feel good, have stronger social connections than unhappy

people (Diener & Seligman, 2002). Feeling close to and valued by other people is a

fundamental human need which contributes to functioning well in the world; connecting with

people is a key way to wellbeing (Aked, et al., 2009).

      Be active. This means to exercise in an enjoyable way that is suited to individual

mobility and fitness levels. Regular physical exercise is linked to a greater sense of wellbeing

and lower rates of depression and anxiety across all ages (Netz, Wu, Becker, & Tenenbaum,

2005). Physical activity protects against the onset of depressive symptoms and anxiety (e.g,

Biddle & Asare, 201; Dunn, Trivedi, Kampert, Clark, & Chambliss, 2005; Scully, Kremer,

Meade, Graham, & Dudgeon, 1998). Furthermore, engagement in physical activity increases

self-efficacy, perceived ability to cope, and provides a sense of mastery, thereby increasing

wellbeing (Aked et al., 2009).

      Take notice. This means to be curious, to be aware of personal emotions and of the

world, to reflect on experiences and appreciate what matters (Aked et al., 2009). Identifying

changes in one's own behaviour promotes wellbeing, particularly being aware of sensations,

thoughts, and feelings (Brown & Ryan, 2003). Taking notice is a form of mindfulness, a

state of being which predicts wellbeing (Brown & Ryan, 2003). Reminding oneself to take

note is a step towards strengthening intrapersonal awareness. Being aware of what is taking

place in the present enhances wellbeing. This is because focusing on positive experiences

strengthens positive emotions, making a person more likely to engage in activities which develop personal resources (Fredrickson, 2003).

Keep learning. This means to try something new, to set a challenge that you will enjoy achieving (Aked et al., 2009). The continuation of learning throughout life increases self-esteem, and encourages social interaction and a more active life. This in turn has been shown to increase wellbeing (Hammond, 2004). Progress and goal attainment provide feelings of satisfaction which in turn increase wellbeing (Locke & Latham, 2006). Thus, goal directed behaviour associated with learning, as well as the activity of learning itself, is important for wellbeing (Aked et al., 2009).

Give. This means to do something nice for a friend, a stranger, or the community. Seeing oneself giving back to the wider community can be incredibly rewarding and will create connections with others (Aked et al., 2009). Mutual cooperation is associated with an enhanced response in the reward areas of the brain. This indicates that social cooperation is intrinsically rewarding (Rilling et al., 2007). As behaviour is often motivated by obtaining reward and avoiding punishment, appropriate stimulation of this reward system contributes to cognitive and social functioning, critical for the development of wellbeing (Aked, et al., 2009). The effect of giving on wellbeing has been empirically supported by research showing that committing an act of kindness at least once a week for six weeks is associated with an increase in wellbeing (Lyubomirsky, Sheldon, & Schkade, 2005).

These actions are designed to promote positive feedback loops in order to reinforce similar and more frequent wellbeing-promoting behaviours (Aked et al., 2009). Given that the perception of stress is caused by a lack of positive experiences and positive emotional states (Cotton & Hart, 2003), using these five action themes is thought to reduce stress and increase wellbeing (Aked et al., 2009).

The Five Ways incorporate actions which promote both the hedonic and eudaimonic perspective of wellbeing. Taking notice is hedonic in nature, as it results in an increase in positive emotions and a decrease in negative emotions. It also encourages aspects of eudemonia, as taking notice can increase positive relatedness by removing pre-existing personal bias during social interactions. Being active by pursuing an enjoyable physical activity helps a person to feel good, and to develop a sense of self-actualisation through increasing mastery. Similarly, when one keeps learning, life purpose and mastery and encouraged. Additionally, when a new skill is learned, this results in feeling good. Connecting with others can be both hedonic and eudaimonic. This helps one to both feel good, and to function well. Finally, by giving personal growth and life purpose are increased, and similar to when one learns, giving back can make a person feel good. Therefore, these activities all relate to both hedonic and eudaimonic behaviours.

The link between these lifestyle behaviours and the likelihood of flourishing has been investigated. It was found that those who engage in these behaviours are more likely to experience a state of high wellbeing (Hone et al., 2015). Furthermore, these five action themes can be incorporated into the workplace to increase employee wellbeing (Aked et al., 2009).

The Wellbeing Game

The Wellbeing Game is a free online game designed by The Mental Health Foundation of New Zealand. The aim is to make players aware of what they do to support their own wellbeing. The Game uses The Five Ways to encourage players to reflect on the positive aspects of their lives in order to support wellbeing. Players log activities which they have taken part in over the course of the day via The Game's online social media platform. Players then match these activities with the relevant Five Ways to Wellbeing. Points are given based on the length of activities that are logged, and virtual badges are used as rewards when specific thresholds are passed.

The Wellbeing Game combines aspects of both primary and secondary interventions. The Game draws on aspects of primary psychosocial interventions by developing relationships within teams. Aspects of secondary interventions in The Game take the form of increased individual resilience to stress. This is thought to occur through the promotion of mindfulness and the building of positive emotions. Additionally, The Game teaches techniques to address the symptoms of strain, such as physical exercise or seeking social support.

A previous evaluation of the 2014 version of The Game indicated that The Game significantly increases wellbeing (Green, 2015).Three main psychological theories explain why The Game should effectively increase wellbeing. These are the Broaden and Build Theory (Fredrickson, 2003), gamification (Hamari, Koivisto, & Sarsa, 2014) and mindfulness (Brown & Ryan, 2003).

Firstly, the Broaden and Build theory states that the function of positive emotions is to broaden a person's thought-action repertoire which in turn helps to build personal resources. A thought action repertoire refers to a person's set of actions which are engaged in after a though occurs. When thoughts are accompanied by negative emotions, the following set of actions that are engaged in is narrow. For example, when a person experiences fear, the following action is to run. Conversely, when positive emotions are experienced, for instance joy, the set of actions that follow is broad. For instance, a person may play, celebrate, talk (Fredrickson, 2000). The Game encourages players to take part in activities which they enjoy, thereby creating positive emotions. According to Frederickson's theory, these positive emotions will broaden an individual's momentary mind-set, allowing broader and more creative thinking. This causes players to further engage in activities that build intellectual, psychological, and social resources. In turn, this alters perceptions of stressful situations by allowing a person to frame these situations in different ways and increases resilience to these

situations (Fredrickson, 2003). Thus, by engaging in The Five Ways to Wellbeing players will experience more positive emotions. Positive emotions have a unique capacity to undermine lasting negative emotions, augment coping strategies, and generate upward spirals where positive builds on positive to produce enduring resources that promote resilience, enhance wellbeing and increase the likelihood that people will feel good in the future (Fredrickson, 2000).

The Wellbeing Game gamifies wellbeing using a social media platform. Gamification is a process of enhancing a non-game activity with elements typical to a game in order to invoke a gamelike experience and thereby increase motivation to partake in the activity (Hamari et al., 2014). Thus, The Game has gamified The Five Ways to Wellbeing by incorporating a points system, leader board, and rewards (badges) in order to increase motivation to engage in The Five Ways. By utilising this technique, The Game attempts to increase wellbeing by encouraging the use of The Five Ways.

Gamification can be understood in terms of operant conditioning. The Game uses positive reinforcement to strengthen the likelihood of similar future behaviours occurring (Kapp, 2012). For example, when an activity is logged, points are given, causing the player to want to continue to engage in and log activities in order to earn more points. Furthermore, when certain point thresholds are passed, badges are given. This random reinforcement schedule further increases the desire to engage in The Game (Miltenberger, 2011).

Finally, The Game relies on mindfulness, a term meaning present-centered attention and awareness (Brown & Ryan, 2003). Mindfulness has broadly positive impacts on human functioning – it allows a person to be aware of their own stream of consciousness, thus aiding the identification of one's own thoughts, feelings, and values. This helps a person to function well by increasing engagement in activities of value, thus, it increases wellbeing (Shapiro, Oman, Thoresen, Plante, & Flinders, 2008). When a person is mindful, attention is given to

the present moment. This allows the stimulus to be interpreted as it is, without attributing meaning drawn from past experiences. This results in a response to the present stimuli itself, rather than past experiences with similar situations. Thus, personal biases are stripped away, allowing for a more positive evaluation of the current situation. This increases the experience of positive emotions, that is, feeling good. Therefore, mindfulness results in feeling good and functioning well (Shapiro et al., 2008). The Game increases mindfulness because it encourages players to engage in the action of taking notice. Additionally, by noting The Five Ways to Wellbeing, players are taking notice of the positive experiences in their lives, thus increasing mindfulness (Aked et al., 2009). Therefore, through the use of this technique, wellbeing should increase.

The Current Study

This research will investigate whether playing The Wellbeing Game can increase players' wellbeing both in an organisational and non-organisational setting. The mechanisms behind how The Game works will also be investigated.

To investigate this, two studies will be conducted, Study 1 in a student population, and Study 2 in an organisational context. Study 1 is focused on testing the assumption that The Game works by altering perceptions of stimuli. Study 2 is focused on investigating the effectiveness of The Game in an organisation. Participants in both studies will complete base-line measures of wellbeing, play The Game for a set period of time, and then recomplete the wellbeing measures. In Study 1, participants will also complete a picture categorisation task, and in Study 2, participants will complete an organisational attitudes survey measuring relationships between team members, job engagement, and turnover intentions, as well as a post-intervention survey on perceptions of The Game within the organisation. This includes perceptions of The Games intrusiveness, alignment with the organisations' values, support for The Game, and its ability to increase connections within the organisation.

Study 1 Hypotheses

Through the use of The Five Ways to Wellbeing which have been shown to increase wellbeing, and The Game's reliance on gamification, the Broaden and Build theory, as well as mindfulness, it is expected that The Game will increase wellbeing in a student population. Therefore,

Hypothesis 1: It is hypothesised that playing The Wellbeing Game for one week will increase self-reported wellbeing compared to those in a control group.

Based on the Broaden and Build theory (Fredrickson, 2003), it is expected that by playing The Game, personal resources should be increased which should decrease perceptions of stress. Therefore,

Hypothesis 2: Playing The Wellbeing Game for one week will significantly reduce self-reported stress compared to those in a control group.

The Broaden and Build theory (Fredrickson, 2003) states that an increase in positive emotions broadens the scope of attentions and increases creativity. Mindfulness causes a person to perceive stimuli as it is in the moment, without personal bias (Brown & Ryan, 2003). Thus, this increase in positive emotions and decrease in personal bias should result in players perceiving stimuli in a more positive light. Therefore,

Hypothesis 3: Playing The Wellbeing Game for one week increases the number of stimuli participants categorise as positive, rather than neutral or negative, compared to a control group.

Study 2 Hypotheses

Given that employee wellbeing is the area of wellbeing which is influenced by the workplace, and that The Five Ways to Wellbeing can be used in the workplace, it is expected that playing The Game should increase wellbeing in employees. Thus,

Hypothesis 4: Employee wellbeing will increase as a function of playing the game over a one month period.

Again, based on the Broaden and Build theory (Fredrickson, 2003), it is expected that by playing The Game, personal resources should be increased which should decrease perceptions of stress. Therefore,

Hypothesis 5: Playing The Wellbeing Game for a one month period will reduce self-reported employee stress.

Finally, engaging in The Five Ways to Wellbeing is linked to flourishing. Flourishing is linked to increased organisational attitudes such as reduced turnover intentions and increased job engagement and relationships between team members. Therefore,

Hypothesis 6: Playing The Wellbeing Game for one month will positively affect employee attitudes toward the organisation, included reduced turnover intentions, increased job engagement and relationships between team members.

Study 1 Method

Participants

The participants were 60 students from the University of Canterbury. The experimental group included 32 participants (24 female and 8 male), and the control group included 28 participants (20 female and 8 male). The mean age across groups was 21.48 ($SD = 3.57$).

Measures

Short Warwick-Edinburgh Mental Well-being Scale. The Short Warwick-Edinburgh Mental Well-being Scale (SWEMWBS; Tennant et al., 2007) was used to measure subjective wellbeing and psychological wellbeing, covering both the hedonic and eudaimonic perspectives of wellbeing. Participants were asked to specify the extent to which they had felt the way described in each of the seven SWEMWBS items over the past two weeks. Responses were recorded on a 5 point Likert Scale (1 = none of the time, 5 = all of the time). A sample item is "I've been feeling optimistic about the future". The full version on

this survey can be found in Appendix A. The reliability of the scale in this study at Time 1 was Cronbach's α = .72 and the reliability at Time 2 was Cronbach's α = .78.

Stress question. A question designed for the purpose of this study was asked in order to assess self-perceived stress. A single item was used in order to increase face validity and to optimise participation by reducing the length of the survey. Single item measures have been found to be reliable when measuring self-reported stress (Fisher, Matthews, & Gibbons, 2015). The question was "Stress means a situation in which a person feels tense, restless, nervous or anxious or is unable to sleep at night because his/her mind is troubled all the time. How often do you experience this kind of stress?" Responses were recorded on a five point Likert scale (1 = none of the time, 5 = all of the time).

Demographic questions. Age and gender information was collected. Age in years was entered as a numerical value and gender was selected from two options – male or female.

International Affective Picture System. The International Affective Picture System (IAPS) is a database of standardised pictures designed for the study of emotion. Each picture has a standardised valence (unpleasant to pleasant), arousal (calm to excited), and dominance (low control to high control) score, ranging from 1 - 9 (Lang, Bradley, & Cuthbert, 1999). This study used a total of 60 pictures. The picture categories differed in terms of valence ratings. 20 pictures portrayed positive scenes (e.g., family, smiling faces, animals), 20 portrayed neutral scenes (e.g., neutral faces, household objects), and 20 portrayed negative scenes (e.g., sad/angry faces, wreckages, aggressive/attack pictures). The cut-off for each category was predetermined by Flood, Näswall, and Helton (2014) classification. Positive pictures were those with a normed valence rating of 6 or above, neutral pictures were those with normed valence ratings above 4 and below 6, and negative pictures were those with a normed valence rating of 4 or less. Arousal and dominance ratings were kept neutral (a rating between 4 and 6) across these categories.

To select these pictures, the IAPS database was ordered on the standardised valence score. Pictures with positive (above 6) or negative (below 4) arousal or dominance ratings were removed. The remaining pictures were split into three categories; those with positive valence ratings, those with neutral valence ratings, and those with negative valence ratings. 20 pictures were selected from each of these three categories. The pictures were then visually inspected and any depicting mutilation or erotica were excluded and replaced with the picture with the most similar valence rating. This was done in order to avoid exposing participants to unnecessary sensitive content. The mean valence ratings of the positive, negative and neutral categories were $M = 6.64$, ($SD = 1.689$), $M = 4.91$ ($SD = 1.769$) $M = 3.29$ ($SD = 1.678$) respectively.

An Analysis of Variance (ANOVA) was run to test for any significant difference between the standard deviation of valence ratings between the three categories. This ensured that an equal spread of valence was achieved between these categories. The independent variable was picture category and the dependent variable was the standard deviation of valence ratings. This ANOVA was non-significant, confirming no difference in valence ratings between the three picture categories.

The 60 pictures were randomly ordered with each picture appearing once.

Manipulation Check. All participants completed a survey asking if they had played The Wellbeing Game since the beginning of the study, and whether they had been asked to play The Wellbeing Game as part of the study. This was used to ensure that those in the control group had not played The Game. A copy of this survey can be found in Appendix B.

Intervention. The intervention was The Wellbeing Game. This is an online game which uses The Five Ways to Wellbeing to encourage players to reflect on things which they have done to support their own wellbeing. The following series of screenshots from The Game depicts the set up procedure and how it is played. Note that when the term "player" is used, this indicates the general procedure used, and when the term "participant" is used, this indicates specific instructions given in this study.
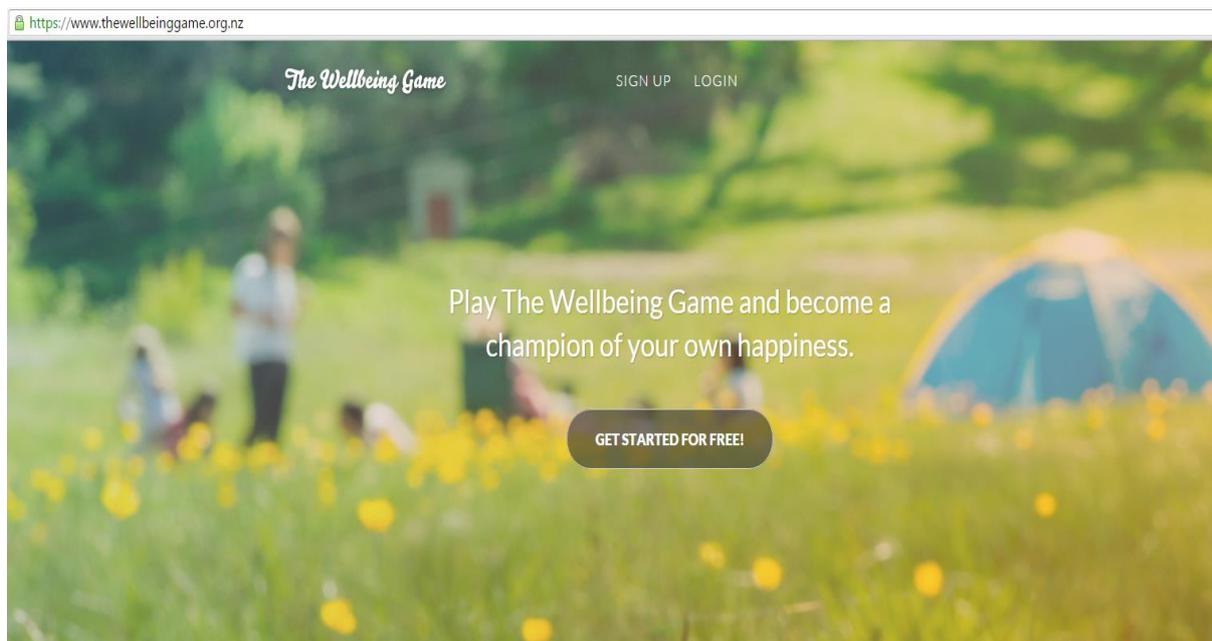

Figure 1. Initial sign up screen which is seen when The Wellbeing Game website is viewed.

As shown in Figure 1, The Wellbeing Game is accessed online and free of charge at www.thewellbeinggame.org.nz. Players click the "Get Started For Free!" button to set up an account.

Figure 2. The Wellbeing Game sign up procedure.

As shown in Figure 2, to sign up to The Game, players enter a nickname, email address, password and real name. Gender, age, and ethnicity are then entered and the terms and conditions have to be accepted before the sign up process is complete. Finally, players complete a wellbeing survey (SWEMWBS) before beginning The Game (see Figure 3). In this study, participants were instructed to enter their participant number as their real name in order to allow data from The Game to be matched with their experimental data. They were also informed that the wellbeing survey was the same as the survey used in the experiment.
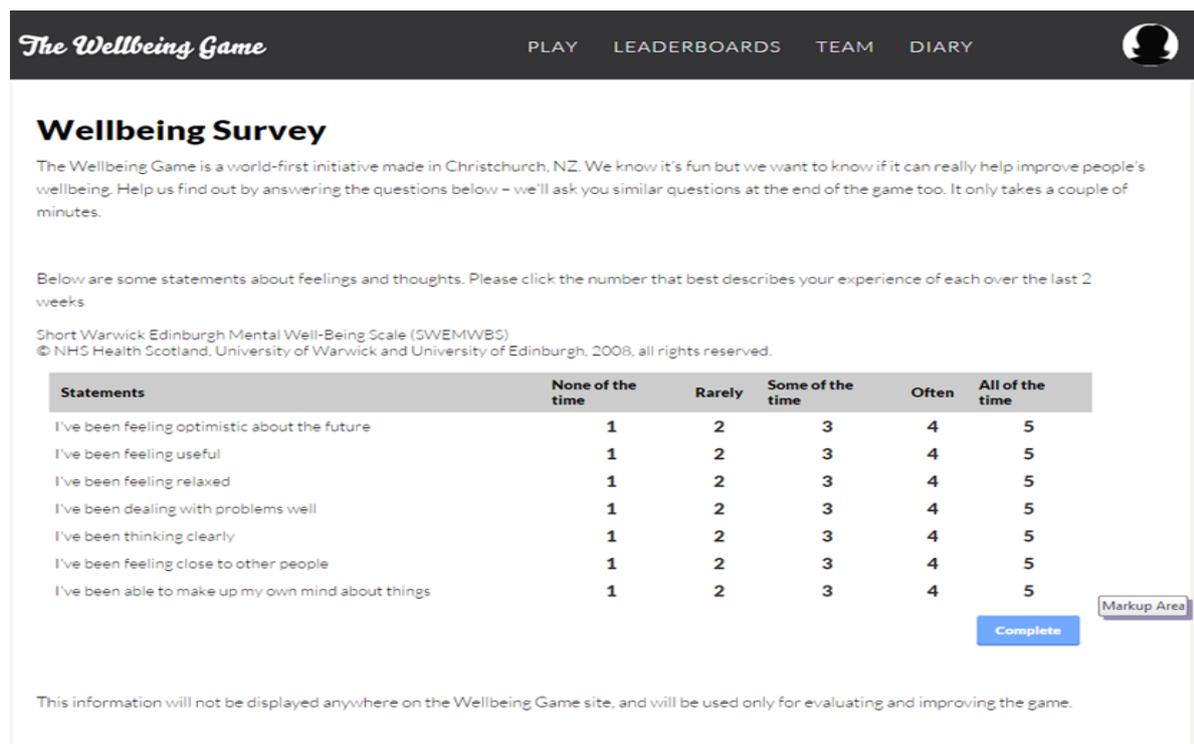
Figure 3. Before beginning The Game, a Wellbeing Survey must be completed

After completing the wellbeing survey, players have the option to join a team, as

shown in Figure 4. Participants played The Game as individuals, therefore they were each

instructed to create a new team and join it.
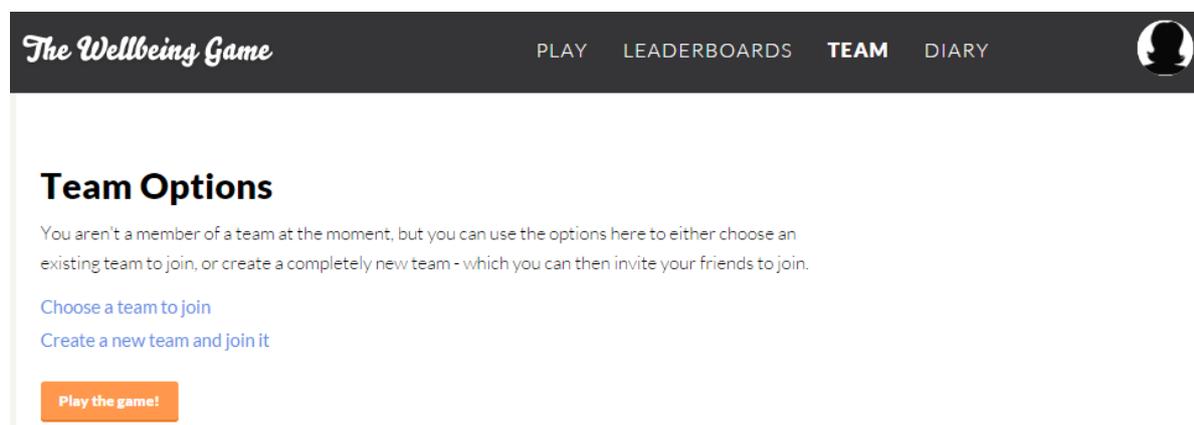
Figure 4. After completing the wellbeing survey, players are given the option to join or create a team.

To set up a team, players create a team name, indicate where their team is based, enter

the name of their organisation, indicate their suburb and city, and create a password to be

given to team members to allow them to join the team. In this study, participants created their

own team name, indicated that their team is based at a tertiary education facility, and were

instructed to call the name of their organisation 'UCExperiment". This allowed for easy

identification between those players taking part in the experiment, and any potential players

from the University of Canterbury who were independent of this research. Figure 5 depicts

this process.
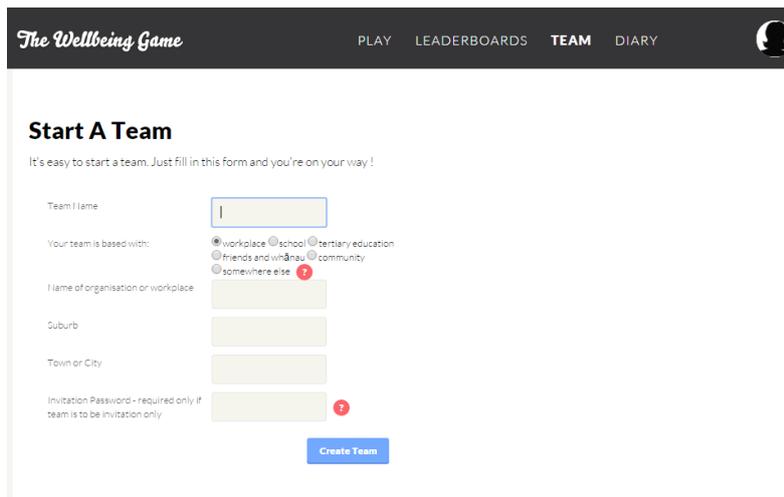
Figure 5. Team set up window.

Once this is complete, players are ready to play The Game. As shown in Figure 6,

instructions on how to play are embedded in The Game.
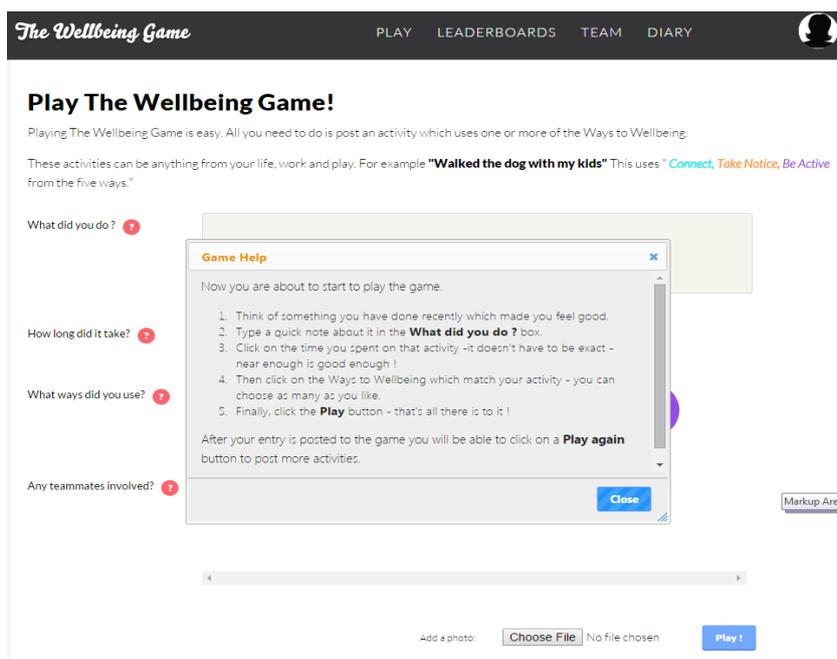
Figure 6. Instructions are embedded into The Game.

To log an activity, as shown in Figure 7, players type in the "what did you do" box, indicate how long the activity took, and select the appropriate Ways to Wellbeing. Once the activity is logged, players are congratulated for completing an activity, and badges are given.

Figure 7. Process of logging an activity.

In this instance, as can be seen in Figure 8, three badges were received, the Learner Plate, Student of Curiosity, and Ox of Wellbeing. These are given when predetermined landmarks are passed throughout The Game, for instance logging the first activity. These badges are used as rewards for progressing through predetermined levels in The Game.
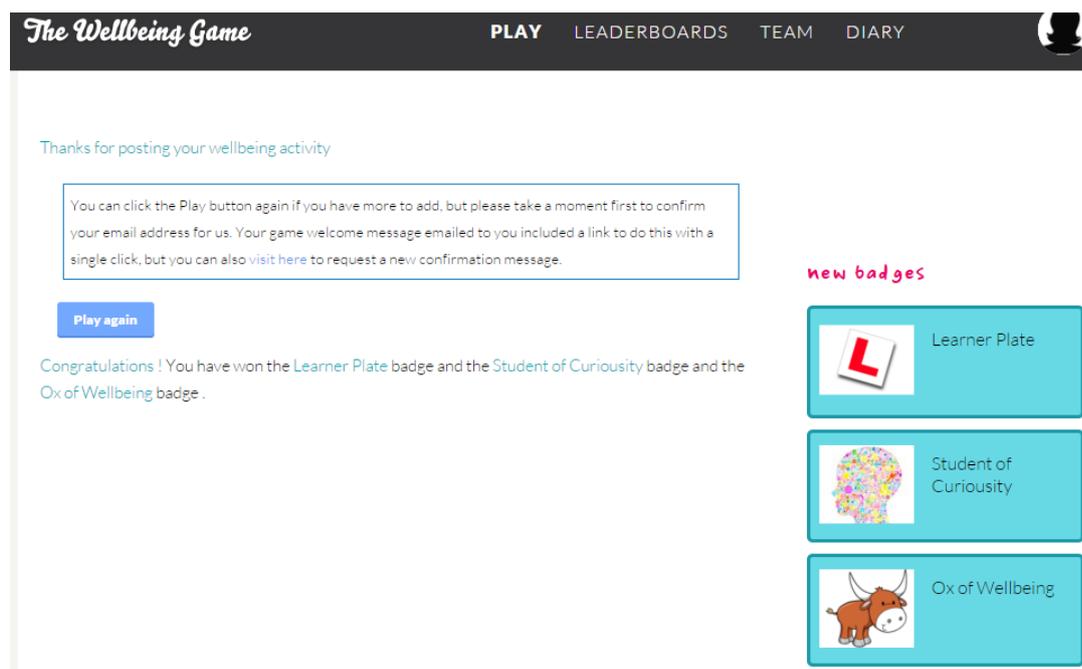
Figure 8. An example of badged given as a reward for playing The Game

Finally, the Leaderboards, Team, and Diary tabs can be viewed to show information

on which team is winning, the teams' activities, and personal wellbeing activities,

respectively. Examples of these are shown in Figure 9.
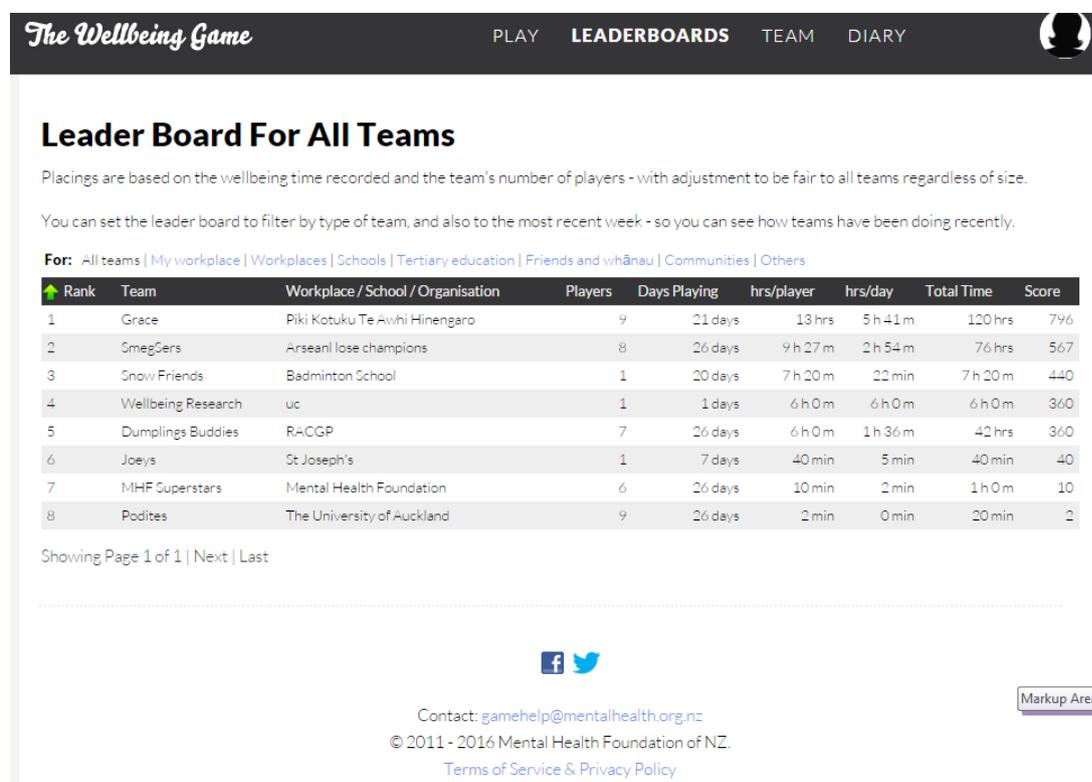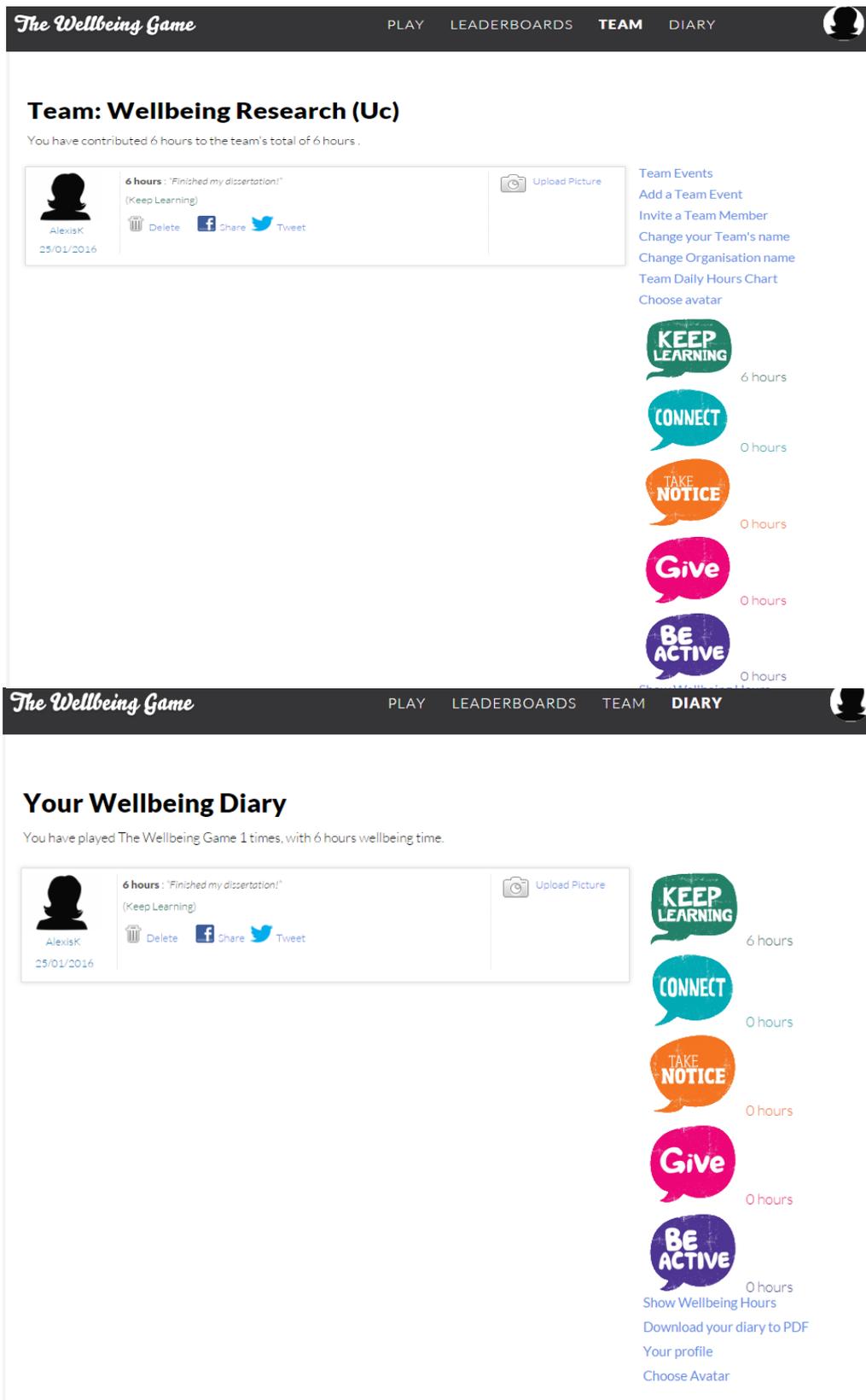
Figure 9. Examples of the leader board, diary, and team activities tabs.

Procedure and Design

The experiment employed a 2 x 2 mixed repeated measures design. Playing The Wellbeing Game or not playing The Game was the between-subjects variable (Experimental vs. Control). The repeated measures dependent variables were survey responses, and image category placement. Ethics approval for this research was received from the University of Canterbury Human Ethics Committee.

Participants were recruited using a variety of methods. These included advertisements placed around the University of Canterbury as well as in an online research participant forum (see Appendix C), through a verbal request to 100 level Psychology laboratory classes, and an email sent to undergraduate Psychology and Commerce students sent by the respective department administrators (see Appendix D). When recruiting, potential participants were informed that they would complete two computer based tasks one week apart, and that they may also be required to complete a five minute task once a day during this week. The name or purpose of this task was not disclosed. After completing both stages of the experiment, participants were compensated with a $10 voucher and were placed in the draw to win one of five $130 vouchers.

Participants were randomly assigned to either the experimental or control condition which were balanced for gender. Participants were then assigned a unique participant number which allowed for each participant to be tracked over time. This number also identified the participant's group membership.

Once participants were individually seated in front of a computer in a room free from distractions at the University of Canterbury they were asked to turn off any personal electronic devices. An information sheet about the experiment was provided (see Appendix E) and participants were given the chance to ask questions before signing an informed consent form (see Appendix E).

A different information sheet was used for the experimental group and for the control group. These were identical aside from that those in the experimental group were informed they would take part in an intervention (the name or purpose was not given) whereas this was excluded from the control group's information sheet. This information sheet contained a small element of deceit. Participants were informed that they were taking part in an image categorisation experiment, rather than an experiment investigating the efficacy of The Wellbeing Game.

Once this form was signed, the experimenter opened the E-Prime software used to run the experiment and entered the participant number and then instructed the participants to enter their age and gender when prompted. Participants were informed that once they clicked "enter" on screen, the task would begin. The experimenter then left the room and participants began the task which was the same for all participants (experimental and control).

Information onscreen informed the participants that they would complete the survey section of the task, followed by a task involving the categorisation of images. Following the last item of the survey, participants were informed that the survey section was finished and that the image categorisation section would follow. Participants were then given the instructions in Figure 10:

> *You are asked to categorise each picture into either a positive, negative, or neutral category, dependent on how you interpret that picture. Some of the pictures may prompt emotional experiences, others may seem relatively neutral. Your categorisation of each picture should reflect your immediate personal experience, and no more. There are no right or wrong answers, so simply **respond as quickly as you can**, based on your immediate feeling toward the picture.*
>
> *Please respond using the index finger of your right hand. Begin by resting you finger on the ↑ arrow key.*
> *Use the ← arrow key for 'negative' images*
> *use the ↓ arrow key for a 'neutral' image*
> *use the → arrow key for a 'positive' image*
> *One you have responded, return your index finger to the ↑ arrow key.*

Figure 10. Instructions presented at the beginning of image categorization experiment.

Three practice images were then individually presented and remained on screen until a response was recorded. Following the completion of the practice images, participants were informed that they were about to begin the actual test, and to remember to respond as quickly as possible. Images were then presented one by one in three blocks of 20 images. Each image remained on screen until a response was recorded. Participants were given a 30 second break in between blocks with a 10 second countdown timer appearing onscreen to signal the end of the break was approaching.

Following the completion of this image categorization task, participants exited the room as instructed to inform the experimenter that the task had been completed. Participants in the control condition were reminded that they would need to return in one weeks' time to re-complete the task before receiving their incentive and then dismissed. Participants in the experimental condition reentered the room with the experiment and were briefed on the intervention.

Information was provided on how to sign up to play The Game, how to play The Game, and the requirement to play every day for the following seven day period. After the participants were dismissed they were sent an email containing this information (see Appendix F), as well as the link to The Wellbeing Game and a link to information on The Five Ways to Wellbeing. These participants were sent a reminder text message on days three, five, and seven.

Seven days after completing Time 1 testing, participants returned and recompleted the same survey and image categorization task as was completed at Time 1, the only difference being that all participants (experimental and control groups) completed the task in groups, ranging in size from one to eight participants. Participants were seated in individual cubical workstations in a computer lab at the University of Canterbury. Participants were unable to see the other participants' screens. The same instructions were given as at Time 1 with the

addition of the request to not talk, and to wait until all participants had completed the task before leaving. Participants were also asked to complete the manipulation check survey following the completion of the computer based task (see Appendix B). Participants were then read the debrief information (see Appendix G) which explained the purpose of the experiment and then were given the opportunity to ask any question. Finally, the participant incentives were distributed.

Study 1 Results

This study aimed to evaluate whether playing The Wellbeing Game can increase Wellbeing, and whether any increase in wellbeing is due to a change in how positively participants perceive stimuli. The responses to the manipulation check survey were checked against each participant's group assignment. No contamination of the control group had occurred.

Hypothesis 1 - Wellbeing. This analysis tested whether playing The Wellbeing Game for one week can increase wellbeing in a student population. The wellbeing of two groups of students (the experimental group who played The Game vs the control group who did not) was measured at Time 1, and again one week later at Time 2.

Pre-analysis data treatment. A Wellbeing Score was calculated using the mean of the seven responses to the wellbeing survey items (SWEMWBS; Tennant et al., 2007). Data was inspected for outliers and none were identified. The assumption of normality of the Wellbeing Score was checked by observing the normal Q-Q plots of each of the groups. The data was deemed sufficiently normal. The assumption of homogeneity of variance between the control and experimental groups was met, as shown by non-significant Levene's test, at Time 1, $F (1, 58) = 2.66$, $p = .108$, and at Time 2, $F (1, 58) = .46$, $p = .458$. The raw data was therefore used.

Analysis. A repeated measures ANOVA with a between and a within subjects

variable was used to test for a statistically significant difference between the mean wellbeing scores of the groups after the intervention. The repeated measures dependent variable was the Wellbeing Score (Time 1 vs. Time 2), and the between subjects independent variable the game participation (experimental vs. control). Given the repeated measures variable only had two levels (Wellbeing Score at Time 1 and Wellbeing Score at Time 2), the assumption of sphericity was met (Field, 2013).

The ANOVA showed that the main effect of group on wellbeing was non-significant, as was the main effect of time on wellbeing. However, as shown in Figure 11 and in line with Hypothesis 1 there was a significant interaction effect between game participation and time which explained 7% of the variation in wellbeing, $F(1,58) = 4.39$, $p < .05$ $\eta p^2 = 0.07$. The experimental group saw an increase in wellbeing at Time Two ($M_{Time1} = 3.35$ [$SD_{Time1} = .67$] vs $M_{Time2} = 3.58$ [$SD_{Time2} = .56$) and the control group experienced a decrease ($M_{Time1} = 3.41$ [$SD_{Time1} = .49$] vs $M_{Time2} = 3.35$ [$SD_{Time2} = .62$]).
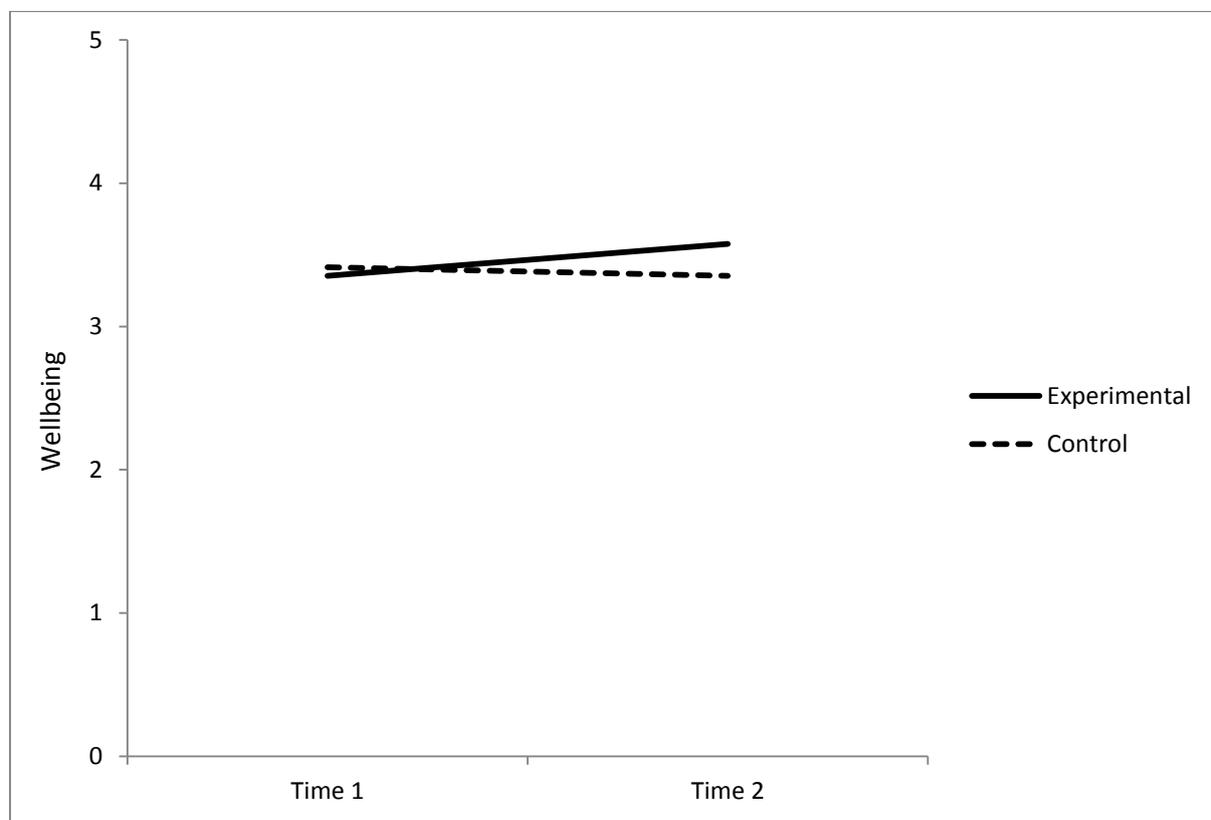
Figure 11: Interaction effect between time and group on wellbeing

Hypothesis 2 – Stress. This analysis tested whether playing The Wellbeing Game for one week can cause a decrease in self-reported stress in a student population. The self-perceived stress of two groups of students (the experimental group who played The Game vs the control group who did not) was measured at Time 1, and again one week later at Time 2.

      Pre-analysis data treatment. Data was inspected for outliers and none were identified. The assumption of normality of the Stress Score was checked by observing the normal Q-Q plots of each of the groups. The data was deemed sufficiently normal. The assumption of homogeneity of variance between the control and experimental groups was met in Time 1 as shown by non-significant Levene's test, $F(1, 58) = 3.55$, $p = .065$, but not at Time 2, as shown by a significant Levene's test, $F(1, 58) = 7.86$, $p = .007$. The data was then visually inspected which confirmed this violation. Therefore, a log transformation of Time 1 and Time 2 data was conducted to resolve this issue. The assumption of homogeneity of variance between the control and experimental groups of this transformed data was met, as shown by a non-significant Levee's test at Time 1, $F(1, 58) = 1.51$, $p = .0.224$, and at Time 2, $F(1, 58) = 3.31$, $p = .074$. This log-transformed data was therefore used in the following analysis.

      Analysis. A repeated measures ANOVA with a between and a within subjects variable was used to test for a statistically significant difference between the mean stress scores of the groups after the intervention. The repeated measures variable was the stress score (Time 1 vs. Time 2), and the between subjects independent variable the game participation (experimental vs. control). Given the repeated measures variable only had two levels (stress score at Time 1 and stress score at Time 2), the assumption of sphericity was met (Field, 2013). The ANOVA showed that the main effect of game participation on stress was non-significant, as was the main effect of time on stress. There was also no significant

interaction effect between game participation and time point on stress, therefore stress was

not reduced and hypothesis 2 was not supported.

Hypothesis 3 - Picture Categorisation. This analysis tested whether those who played The

Game would place more pictures in a more positive category than those who do not play the

game. To place a picture in a more positive category means a move from a negative to a

neutral categorisation; a move from a neutral to a positive categorisation; or a move from a

negative to a positive categorisation.

   Pre-analysis Data Treatment. The categorisation task responses were checked for

errors. Research shows that a minimum of 300ms is required to process and response to

visual stimuli (Greenwald, Nosek, & Banaji, 2003). Therefore, responses faster than 300ms

were identified as failures to inhibit a response and removed from further analysis. This

resulted in the removal of a total of 17 responses (0.21%) from 11 different participants (5

experimental and 6 control).

   Data was inspected to ensure that participants had used the correct response keys. To

do so, a marking variable was created for each participant which showed whether each

picture had been correctly categorised according to the standardised valence score determined

by the International Affective Picture Systems (IAPS; Lang et al., 1999). Participants who

had incorrectly categorised 50% or more pictures at either Time 1 or Time 2 were excluded

from further analysis. The reasoning for this is as follows. If the positive and negative

response keys were used the wrong way around, a participant who would have otherwise

categorised every picture correctly would unintentionally categorise 67% of pictures

incorrectly (the 20 neutral pictures would be unaffected). However, when the correct keys are

used, the most likely source of error is miscategorising a neutral picture or a picture that was

bordering on the neutral category (negative rating between 3.5 and 4, positive rating between

6 and 6.5). With the pictures used, this accounts for only 39% of stimuli. Therefore, the cut

off for exclusion was set at 50% to allow for some variation in valence perception but to exclude data which was not valid.

This suspected error was not corrected by reversing responses (i.e., replace "positive" responses for "negative" responses and vice versa) to avoid introduced further error into the data. These participants were therefore deleted from further analysis (Time 1 and Time 2 data). This resulted in the removal of 10 participants (5 experimental and 5 control).

A Rating Index was calculated using the remaining data. Each response was assigned a value which reflected the participant's category placement of each stimulus. A negative response was assigned the value -1, a neutral response was assigned the value 0, and a positive response was assigned the value 1. The mean categorisation rating was then calculated for each participant which reflected the proportion of images placed in each category. The categorisation index had a range of -1 to 1, with -1 meaning all images were categorised as negative, and 1 meaning all images were classed as positive

Observing the Q-Q plot of the data showed that the data was normally distributed and linear. The assumption of homogeneity of variance between the control and experimental groups was met, as shown by non-significant Levene's tests, at Time 1, $F (1, 48) = .208$, $p = .651$, and at Time 2, $F (1, 48) = .671$, $p = .417$. Therefore, no data transformations were needed before analysis.

Analysis. A repeated measures ANOVA with a between and a within subjects variables was used to test for a significant difference between picture categorisation between the experimental and control groups after playing the game. The within subjects repeated measures variable was picture categorisation (Time 1 vs. Time 2), and the between subjects independent variable was game participation (participation [experimental] or no participation [control]). Given the repeated measures variable only had two levels, the assumption of sphericity was met (Field, 2013). The results of the analysis showed that there were no

significant main effects of group or time, and there was no significant interaction between group and time point, $F(1, 48) = .33$, $p = .569$, $\eta p^2 = .07$. However, there was a trend for those in the experimental group to categorise pictures more positively in Time 2 than in Time 1 ($M_{Time1} = -.156$ [$SD_{Time1} = .167$], $M_{Time2} = -.123$ [$SD_{Time2} = .164$]) and for those in the control group to categorise stimuli more negatively ($M_{Time1} = -.185$ [$SD_{Time1} = .179$], $M_{Time2} = -.196$ [$SD_{Time2} = .181$])

The mean number of pictures placed into each of the three categories was then inspected. This showed a consistent trend. At Time 2 the experimental group placed fewer pictures in the negative group and more in the positive and neutral categories, and the control group placed more pictures in the negative category, and fewer in the positive and neutral categories (refer to Table 1). However, a repeated Multivariate Analysis of Variance (MANOVA) where the repeated measured variables were positive category placement, neutral category placement and negative category placement and the between subject variable was game participation (experimental vs. control) showed that these differences were all non-significant. Thus, hypothesis 2 was partially supported.

Table 1.
Mean and standard deviation of the number of pictures placed in each category across T1 and T2. F and P values refer to the interaction between group and time on category placement.

	Experimental					Control					
	T1		T2				T1		T2			
	M	SD	M	SD			M	SD	M	SD	F	P
Positive	17.15	6.22	17.20	6.11		Positive	16.55	6.50	16.25	5.570	.072	.789
Neutral	16.69	6.66	17.68	7.01		Neutral	16.00	5.81	15.40	10.01	.015	.902
Negative	26.15	6.20	24.96	6.28		Negative	27.35	6.23	28.20	8.051	.013	.911

M = mean, SD = standard deviation

Study 2 Method

Participants

      The participants were 52 employees from a large financial organisation in New Zealand. This organisation was sourced in collaboration with the Mental Health Foundation of New Zealand who was responsible for contacting the organisation's Wellbeing Champion (the person in charge of promoting wellbeing within the organisation). Participants volunteered to participate in response to a request from their Wellbeing Champion. 157 employees completed the pre-game survey, however only 54 employees completed the intervention and the post-game survey.

Measures

      Short Warwick-Edinburgh Mental Well-being scale. This was identical to in Study 1. The reliability of the scale in this study at Time 1 was Cronbach's $\alpha = .86$ and the reliability at Time 2 was also Cronbach's $\alpha = .86$

      Stress question. This was identical to in Study 1. An additional reason that this single item scale was used to measure stress was to ensure that as little of the organisation's time was used as possible.

      Organisational attitudes. Three items were used to measure three organisational attitudes which were relationships between team members, turnover intentions, and job engagement. The relationships question was "There are good relationships between team members" (Senior & Swailes, 2007); the turnover intentions question was "I am happy to stay with this organisation for the next two years" (designed for this study) and the job engagement question was "I am highly engaged in this job" (Saks, 2006). Responses to these items were recorded on a 5 point Likert scale (1 = strongly disagree, 5 = strongly agree). Single item scales were used in order to minimise the time commitment to both reduce the use of employee's time and to increase the likelihood of participants completing the survey.

Intervention. The intervention was The Wellbeing Game. This was identical to in Study 1 aside from that in this study The Game was played in teams. Therefore, participants were instructed to join the team assigned to them by the organisation's Wellbeing Champion. Additionally, no participant numbers were used in this study; therefore participants entered their real name when required.

Post-Game questionnaire. Four questions asked at the conclusion of The Game in order to assess players' perceptions of how well they thought The Game was integrated in their everyday work, and their general experience of The Game. Responses were recorded on a 1 to 5 Likert Scale. These were "How does the Game relate to regular work activities – is the game intrusive?" (1 = intrusive, 5 = integrative). "Does The Game make sense given what your organisation stands for? (mission, vision, values)" (1 = not at all, 5 = to a large extent). "Do people support The Game in your organisation? (1 = not at all, 5 = to a large extent). "This Game has enabled me to connect more with others" (1 = strongly disagree, 5 = strongly agree). These questions were designed in collaboration with the Mental Health Foundation of New Zealand for the purpose of this study.

Procedure and Design

This study used a repeated measures design where the repeated measures variables were wellbeing and organisational attitudes post-game. Ethics approval was obtained by the University of Canterbury Human Ethics Committee.

At the beginning of the month during which The Game was played, the organisation's Wellbeing Champion, that is, the person who had been in contact with the MHF, emailed participants The Game set up information (see Appendix H). When setting up an account, participants completed the wellbeing, stress and organisational attitudes survey. Participants then played the game for the period of one month. At the completion of the month, participants were sent a post-game email (see Appendix I) from the Wellbeing Champion. This email contained information on the winners of the game, the number of teams that

played and total hours logged. A request to complete the post-game survey, containing the same questions as the pre-game survey with the addition of the four post-game questions was included in this email. Participants then completed the post-game survey. Data was then given to this study's' researchers for analysis.

Study 2 Results

The study tested whether playing The Wellbeing Game within an organisation for a one month period can increase wellbeing and decrease stress in employees, as well as affect several organisational attitudes in a desirable way. The Game was played for one month, and measures of wellbeing, stress, and organisational attitudes were taken at the beginning (Time 1) and end (Time 2) of the month.

Hypothesis 4 – Employee Wellbeing. An initial observation of the data suggested that wellbeing increased after the game was played for the month. The mean wellbeing at Time 1 was 3.75 (SD = .48) and the mean wellbeing at Time 2 was 3.84 (SD = .51). A paired samples *t*-test was carried out to test whether this difference in wellbeing across Time 1 and Time 2 was significant. This showed that that playing The Wellbeing Game had no statistically significant effect on wellbeing, $t(51) = -1.642$, $p = .107$.

Because comments from players indicated that The Game had been perceived to be effective, four repeated measures Analyses of Covariance (ANCOVAs) were conducted to attempt to explain these comments empirically. The repeated measures variable was wellbeing at Time 1 and at Time 2, and the covariates used were the four Post Survey question. These questions were "how does The Game relate to regular work activities – is the game intrusive?" (Intrusive), "does The Game make sense given what your organisation stands for?" (Makes Sense), "do people support The Game in your organisation?" (Support for Game), "this Game has enabled me to connect more with others" (Connect). Given the small number of participants, the five possible groups that could be created using the survey responses (1 - 5 Likert scale) were collapsed into three groups to increase the number of

participants in each group. There was no significant effect of the Intrusive, Makes Sense, or

Support for Game questions. However, it was found that wellbeing significantly changed

when the degree to which employees felt the game had enabled them to connect more with

others was controlled for, $F(1, 49) = 4.212$, $p = .021$, $\eta p^2 = .147$. When plotted, this shows

that wellbeing increased for those who felt the game helped them to connect more with others

(Connect responses of 4 or 5 [agree]), but decreased for those who did not (see Figure 12).
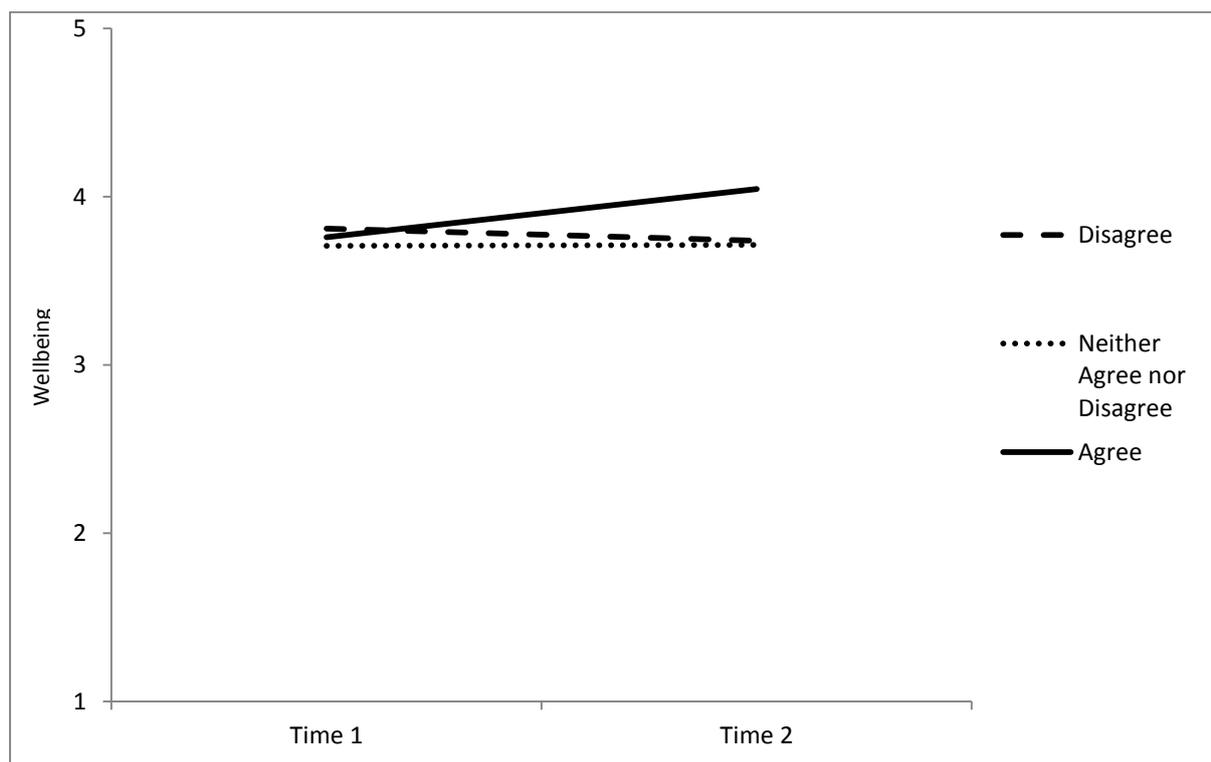
Figure 12: Wellbeing scores at Time 1 and Time 2 when the degree to which The Game
was perceived to increase connects with others was controlled for.

Hypothesis 5 – Employee Stress. An initial observation of the data suggested that stress was

reduced after the game was played for the month. The mean stress score in Time 1 was 2.92

($SD = .74$) and the mean stress in Time 2 was 2.75 ($SD = .76$). A paired samples *t*-test was

carried out to test whether this difference in stress across Time 1 and Time 2 was significant.

This showed that playing The Wellbeing Game significantly reduced stress in employees,

$t(51) = -2.021$, $p = .049$.

Hypothesis 6 - Organisational Attitudes. These analyses tested whether playing The Wellbeing Game in an organisation could influence employees' perceptions of three organisational attitudes. These were relationships between team members, turnover intentions, and job engagement. To test this hypothesis, three repeated measures Analyses of Variance (ANOVAs) were conducted. The repeated measures variables were turnover intentions, relationships between team members, and job engagement, No significant changes were found in any of the three organisational attitudes.

Research suggests that organisational attitudes are improved when wellbeing is high (Hone et al., 2015). Three repeated measures ANCOVAs were run using the Time Two wellbeing measure as a covariate. The repeated measures dependent variables were turnover intentions, relationships between team members, and job engagement. However, no significant differences in any of these organisational attitudes were found. Hypothesis 5 was therefore not supported.

<div align="center">

Discussion

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This research investigated whether playing The Wellbeing Game can increase wellbeing and decrease stress in both a non-organisational and an organisational context. The assumption that any increase in wellbeing is due to a change in perception of environmental stimuli was tested. Finally, this research tested whether using The Game in an organisation can increase relationships between team members and job engagement and decrease turnover intentions. The results showed mixed support for the hypotheses. Hypothesis 1 was supported; playing The Wellbeing Game increased wellbeing in the student group. However hypothesis 2 was not supported; The Game did not decrease self-reported stress in the student group. Hypothesis 3, that student players would place more images in a more positive category after playing The Game was also not supported. However, there was a tendency for those in The Game condition to place more images in the positive category and for those in

the control condition to place more images in the negative category. Support for hypothesis 4, that playing The Game in an organisation would increase employee wellbeing was mixed. Wellbeing only increased when the degree to which players felt the game had helped them to make more connections with those around them was taken into account. Hypothesis 5 was supported; playing The Game decreased stress in employees. Finally, The Game did not increase any of the tested organisational attitudes; therefore hypothesis 6 was not supported.

Study 1 Findings

The finding that playing The Wellbeing Game can increase wellbeing in a student population is consistent with the evaluation of the 2014 version of the game which was found to significantly increased wellbeing (Green, 2015). This is interesting because there was a major methodological difference between these studies. In the current study, participants played The Game individually, whereas in Green's (2015) evaluation, a significant portion of participants played The Game in a team. As Green (2015) found that there was no difference in the increase in wellbeing for those who played The Game in a team and those who did not, and as this study did not use teams, it appears that the team aspect of The Game may not contribute to its ability to increase wellbeing.

The finding that The Game increases wellbeing supports research suggesting that engaging in The Five Ways to Wellbeing is linked to an increased likelihood of flourishing (Hone et al., 2015). Prior to the current research, Hone et al., (2015) study was the only empirical study which investigated the link between The Five Ways and wellbeing. However, Hone et al. (2015) used a cross sectional design, therefore the causal direction of the relationship between The Five Ways to Wellbeing and flourishing could not be established.

The present study has theoretical importance because it allows the causal direction of this relationship to be identified. Study 1 used an experimental design with one independent variable, a control group and an experimental group, random assignment, and a longitudinal design. Randomly assigning participants to the experimental and control groups allowed

changes in the experimental group to be compared to changes in a group who did not play The Game. Because random assignment to the two groups removed any inherent differences between the groups pre-intervention, any change in wellbeing post intervention can be attributed to the one independent variable - participation in The Wellbeing Game (which focuses on using The Five Ways). Finally, a longitudinal design was used, allowing The Game's effect over time to be observed. Therefore, it can be concluded that engaging in The Five Ways to Wellbeing increases the likelihood of experiencing a high level of wellbeing, rather than those who have a high level of wellbeing being more likely to engage in The Five Ways.

However, a small methodological caveat is present. This research looked at the link between The Wellbeing Game and wellbeing rather than The Five Ways and wellbeing. Although it is very unlikely that it was The Game itself, rather than The Five Ways which resulted in the increase in wellbeing, future research should verify this finding. To do this, a study could be carried out using 3 groups. Those who link daily activities to The Five Ways in a diary, those who play The Game, and those who play a game unrelated to wellbeing. Differences in wellbeing between the three groups would then be compared. This would ascertain whether engaging in The Five Ways alone increases wellbeing, whether The Game augments this increase, or whether playing any game with a team is the reason for an increase in wellbeing.

It was also found that while wellbeing increased for those in The Game condition, it decreased for those who did not play The Game. Given that the intervention took place during the last weeks of the University year, many participants had final tests and assignments due during the post intervention testing. Therefore, it is understandable that wellbeing would decrease at this point in time due to having less time available to give, to connect, and to be active. The Game's ability to not only increase wellbeing, but prevent a

decrease in wellbeing is an important practical finding. This intervention could be promoted to at-risk-members of society, for example students during exam time, to prevent a reduction in wellbeing.

The heavy workload experienced by participants due to end of year tests and assignments may explain why hypothesis 2 was not supported; playing the Game did not significantly reduce stress. The finding that The Game did increase wellbeing but did not reduce stress aligns with research that shows that wellbeing and stress exist on separate, although overlapping spectrums (Keyes, 2005). Given the likely high workload students experienced at the time of the intervention, stress is likely to be experienced because work demands are likely greater than the personal resources available to cope with the demands. The finding that stress remained constant but wellbeing increased for those who played The Game reinforces the theory that these two constructs exists on separate spectrums.

The Wellbeing Game did not cause players to place significantly more pictures in a more positive category compared to those who did not play The Game. However, there was a tendency for those in the experimental condition to place slightly more pictures in the positive category after having played The Game and those in the control condition to place slightly more pictures in the negative category at Time 2. This picture categorisation tendency is accompanied by a similar significant pattern in the change in wellbeing. Wellbeing increased for those who played The Game and decreased for those who did not. Overall, pictures were categorised more positively for those who played The Game and more negatively for those who did not. It may be that these changes in picture categorisation would have reached significance if more time was spent playing The Game.

The hypothesis that after playing The Game, visual stimuli would be perceived more positively was based on the Broaden and Build theory as well as mindfulness theories. However, the mechanisms behind these theories take time to result in positive changes.

Participants were only given one week to play The Game. The Broaden and Build theory works in two stages. First, positive emotions result in a broader thought-action repertoire, then as a result, personal resources are built through engagement in a wider variety of activities. Small incremental changes in the availability of personal resources overtime eventually result in a large effect (Frederickson & Joiner, 2002). It is understandable that wellbeing would increase but the perception of the valence of stimuli did not because a key aspect of wellbeing is feeling good, that is, experiencing positive emotions. However, any change in perception of the picture stimuli would likely have been as a result of a long-term development of personal resources, something which would take longer than one week to occur.

Additionally, mindfulness is a state which takes much practice to achieve. Although many workplace mindfulness training programs take only a few hours to complete, daily practice is required in order to become a mindful person, with many people viewing mindfulness as a lifelong pursuit (Good et al., 2015). Therefore, it is likely that more exposure to The Game would be needed before any increase in the perception of positive stimuli would occur.

Some methodological considerations could be taken into account when considering the results. Longitudinal research should ensure that the study time frames correspond with the underlying mechanism of the change in order to avoid insufficient time for a change to occur, or to not allow too much time before re-testing that any effects have dissipated (Taris & Kompier, 2014). Although the underlying mechanisms contributing to how The Game works (mindfulness and Broaden and Build) take time to have an effect, a one week period was chosen because it was believed that students were unlikely to commit to playing The Game for longer than this. Because previous research indicated that playing The Game at least three times resulted in an increase in wellbeing (Green, 2015), it was thought that one

week would be sufficient. However, there was no indication in the previous research as to over how long a period these three game-plays occurred; it is possible that they occurred over longer than one week. Furthermore, although only three activities were logged, more unlogged activities may have been engaged in over this time frame, thus giving the underlying mechanisms more opportunity to have an effect. Therefore, future research should investigate the effect of The Wellbeing Game on perception of stimuli over a longer period of time.

Study 2 Findings

The hypothesis that The Game would result in an increase in employee wellbeing when played in an organisation was only partially supported. In Study 2 (the organisational sample), wellbeing only increased if The Game was perceived to help employees to make more connections with those around them. Possessing strong social connections has been shown to increase wellbeing (Diener & Seligman, 2002), therefore it is reasonable that the effects of The Game on wellbeing were present when social connections were also improved.

Gamification was intended to increase motivation to engage in The Game and therefore increase wellbeing; however it may have had a detrimental effect on efficacy of The Game, contributing to the limited effect on wellbeing in Study 2. Wellbeing is best increased through intrinsic motivation (Ryan & Deci, 2001); however gamification could change this motivation to extrinsic. A key aspect of wellbeing is eudemonia. Eudaimonic living is characterised by the presence of fully engaged values and activities that are enjoyable. However, playing The Game may detract from this full engagement by shifting the motivation to partake in these activities from intrinsic enjoyment to an extrinsic motivator - winning The Game

It is possible that the competitive team aspect of The Game actually decreased the quality of some of the relationships between colleagues. The developers of The Game initially believed that the inclusion of the team aspect would help to facilitate social

connections, however wellbeing only increased in Study 2 for those who felt that social connections had been increased – this was not all players. Moreover, comments from players indicated dissatisfaction with the competition. It may have been that the inclusion of a competitive aspect impeded social connections for some. Given that Green (2015) found that there was no significant difference in the increase in wellbeing between those who played in a team and those who did not, further investigation should be conducted to ascertain the function of the team aspect of The Game.

As different methodologies were used between all of these studies, a conclusion regarding the utility of team membership cannot be clearly drawn. Therefore, in order to evaluate the most effective way to use The Game, future research should investigate this discrepancy. This could be achieved by using four groups: those who play The Game in a team, those who play The Game individually, those who do not play The Game but belong to an unrelated team, and those who do not play the game and are not in a team. Comparisons between these four groups would ascertain the function of team membership.

Furthermore, in a comprehensive review of resilience interventions, the only study which found no effect used an online intervention (Robertson, Cooper, Sarkar, & Curran, 2015). The authors of this ineffective program believe that the online platform limited engagement in the intervention which was thought to explain its lack of success (Abbott, Klein, Hamilton, & Rosenthal, 2009). Because participants in Study 1(student group) were informed that they had to play The Game daily in order to receive their incentive, engagement in The Game was less of a concern, however there was no tangible incentive for participants in Study 2 (the organisational context) to play The Game. Therefore there may have been less engagement in The Game in Study 2 compared to Study 1. This may be a reason that wellbeing did not increase in Study 2.

The finding that The Game helped reduce stress in an organisation aligns with previous research which suggests that primary (interventions targets at the organisation) and secondary (interventions targets at the individual) stress management interventions are effective at reducing stress, particularly in the short term. The Wellbeing Game is a combination of a primary and secondary intervention which builds teams and alters the perception of stressors and thus decreases strains. It does this by both increasing individual resilience to stress through promoting mindfulness and building positive emotions, and by teaching techniques to address the symptoms of strain, such as physical exercise or seeking social support. Although the primary aspect was ineffective, it is logical that The Game as a secondary intervention is effective at reducing employee stress.

The fact that wellbeing did not increase for the majority of players in the organisational study may explain why hypothesis 6, that The Game would increase organisational attitudes, was also not supported. No increases in any of the three organisational attitudes were seen. This makes sense given that having a high level of wellbeing results in stronger relationships between team members, higher job engagement and fewer turnover intentions. However, the increase in wellbeing was not substantial. Therefore, an improvement in these outcomes cannot be expected.

General Discussion

Combining the results from the two studies, the findings show that playing The Game can both decrease the perception of stressors and increase wellbeing. Engaging in wellbeing promoting activities appears to reduce stress while also increasing wellbeing. This can be understood by considering the interaction between The Five Ways, and the mechanisms behind The Broaden and Build theory and theories of mindfulness. By using The Five Ways, the frequency of positive emotions should be increased. These positive emotions, according to the Broaden and Build theory, encourage a person to engage in varied, novel, and exploratory thoughts and actions (Fredrickson & Branigan, 2005). This should eventually

build personal resources, such as resilience to stress. This should motivate players to continue to partake in positive activities which can be linked to The Five Ways. Thus, according to this theory, a cyclic relationship should occur where playing The Game results in positive emotions which lead to engagement in more positive activities, and thus more positive thoughts, and so on. The effect of this theory was shown in the present study by an increase in wellbeing, that is, feeling good, therefore experiencing more positive emotions, and a decrease in stress, which indicates the development of personal resources.

Finally, The Game draws on mindfulness techniques by using the action 'take notice' as well as the act of logging activities which may also help to explain The Game's ability to increase wellbeing. Mindfulness allows a person to interpret an event as it is, free from personal bias (Brown & Ryan, 2003). This means that players interpret an event as it occurs, rather than inferring meaning based on past experiences. This removes any pre-existing negative bias meaning that players may begin to interpret events in a more positive way, allowing players to feel good, a key aspect of wellbeing (Aked et al., 2009). This may explain the increase in wellbeing seen in Study 1. These positive feelings link back to the Broaden and Build theory. As mindfulness increases, so do positive emotions, and therefore more positive activities may have been engaged in. This builds personal resources, including resilience to stress and wellbeing (Fredrickson, 2003). Thus, The Game's ability to increase wellbeing and reduce stress can be understood given the theories supporting The Game.

Strengths and Limitations

The study may have a few limitations which should be taken into account when interpreting the results. Firstly, in Study 1, the same picture stimuli were used in Time 1 and Time 2 and these were presented in the same order. Thus participants may have remembered the pictures, making a change in category placement less likely. However, changing the order of the picture presentation could have influenced the category placement. If a very negative

photo was presented before a neutral photo, the negative feelings induced by the negative photo may have had an effect on the perception of the following images. Therefore, it was decided that keeping the same order was the best option as this would not introduce a new, potentially confounding variable.

Secondly, in Study 2, no control group was used. This means that a comparison between those who played The Game in an organisation and those who did not play The Game could not be made. However, given the organisational context in which The Game was played, a control group free from contamination would have been extremely difficult to achieve. The Wellbeing Game is a resource that is provided free to the public. If other members of the organisation caught wind of The Game being used where they work, there would be no way to stop these people from playing The Game themselves. Therefore, the use of a control group would have been impractical.

The sample size used was also a limitation in both studies. The small number of participants means that the power of both studies is limited. As only 60 and 54 participants were used in Study 1 and Study 2 respectively, there may not have been enough power to identify any differences between groups. This means that the non-significant findings may actually be due to a lack of power rather than a true absence of a difference. Future research should replicate this study using a larger sample size.

Additionally, the experiment in Study 1was not carried out in a lab which meant that the independent variable could not be isolated from other potential confounding variables. Therefore, other events occurring in the participants' lives may have affected the results. This non-lab setting is both a strength and a potential limitation. Although this lack of isolation means that not all extraneous variables could be controlled for, it adds an element of reality to the research. In practice The Game is not used in an isolated environment. Therefore, the fact

that the results show that The Game is effective in a real world environment strengthens the utility of this research.

This research has several additional strengths. Firstly, Study 1 of this research was the first time that The Wellbeing Game has been experimentally tested, and Study 2 evaluated The Game using a longitudinal design. The experimental design used in Study 1 allows the causal direction of the link between wellbeing and The Game to be determined, while the longitudinal design of Study 2 shows that The Game can effectively increase wellbeing in an organisational setting. Even though the experiment was not conducted in isolation, the two studies together are a step along the right path to support the casual direction of this relationship. This adds to the growing body of evidence suggesting that The Game is a useful wellbeing intervention.

Additionally, this was the first time that The Game was used in an organisational setting. The finding that The Game is only effective in an organisation when the degree to which employees feel it helped strengthen connections with those around them is important. This highlights the importance of social support in organisations. Organisations should take heed of this finding, ensuring that wellbeing interventions work to increase the quality of workplace relationships.

Finally, this research is the first to investigate the mechanisms behind how The Game works to increase wellbeing by using a quasi-experimental setting. Future studies can build on this design to further study the mechanisms behind The Game.

Conclusion

In conclusion, this research utilised two studies to evaluate The Wellbeing Game in both an organisational and a non-organisational context. The results showed that The Wellbeing Game is effective in increasing wellbeing in a student population as well as effective in decreasing stress in an organisation. This research has practical importance. As the Wellbeing Game has been shown to be a useful way to increase wellbeing and to decrease

stress, the Mental Health Foundation should continue to promote The Game. This will in turn

benefit the wellbeing of New Zealand as a society. Additionally, The Game has been shown

to decrease stress in employees and increase employee wellbeing when social connections are

increased. Given that stress comes at a great cost to organisations, The Game can be

implemented in organisations as a way of reducing this stress. However, given The Game

wellbeing when it was perceived to increase social connections, before implementing The

Game, organisations should ensure that the purpose of The Game is made clear.

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Appendices

Appendix A. Full copy of the Short Warwick-Edinburgh Mental Well-being Scale

1. I've been feeling optimistic about the future

2. I've been feeling useful

3. I've been feeling relaxed

4. I've been dealing with problems well

5. I've been thinking clearly

6. I've been feeling close to people

7. I've been able to make up my mind

Appendix B. Manipulation check used to ensure control group in Study 1 had not been contaminated

UC User Code: _____Participant Number:_____

1. Have you played The Wellbeing Game since beginning this study?   Yes / No

2. Were you asked to play The Wellbeing Game as a part of the study?   Yes / No

Appendix C. Advertisement which was placed around the University of Canterbury and online

HELP ME!

What's in it for you?

$10 MTA/ Westfield voucher, and a chance to win one of five $130 Northlands Mall vouchers

Participants needed to partake in important research.

Who: you!

What: a 20 minute experiment now, then again in one weeks' time.

How: email Alexis Keeman

alexis.keeman@pg.canterbury.ac.nz to schedule a time.

Thank you!

alexis.keeman@pg.canterbury.ac.nz	alexis.keeman@pg.canterbury.ac.nz	alexis.keeman@pg.canterbury.ac.nz	alexis.keeman@pg.canterbury.ac.nz	alexis.keeman@pg.canterbury.ac.nz	alexis.keeman@pg.canterbury.ac.nz	alexis.keeman@pg.canterbury.ac.nz	alexis.keeman@pg.canterbury.ac.nz	alexis.keeman@pg.canterbury.ac.nz	alexis.keeman@pg.canterbury.ac.nz	alexis.keeman@pg.canterbury.ac.nz	alexis.keeman@pg.canterbury.ac.nz	alexis.keeman@pg.canterbury.ac.nz	alexis.keeman@pg.canterbury.ac.nz	alexis.keeman@pg.canterbury.ac.nz

Appendix D. Email sent to undergraduate Psychology and Commerce students by the respective department administrators

Hey everyone!

I am currently running an experiment involving a task which will take no **longer than 20 minutes** at a time during the week of 28th September (this week!), and the same task again in the week of 12th October. The task involves a set of surveys, and then you will be asked to look at some pictures. You may also be randomly assigned to a condition where you will need to do an activity once a day during the week of 5th October. This activity can be done at any time during the day, from wherever you like, and will take you no longer than 5 minutes a day.

After completing the experiment the second time, you will be rewarded with a **$10** MTA or Westfield voucher, and be put in the draw to win one of five **$130** Northlands mall vouchers.

If you would like to participate, please email alexis.keeman@pg.canterbury.ac.nz listing 3 times which suit you this week. The experiment will run between 8am and 6pm on Thursday and Friday. The experiment runs on the hour, at 20 minutes past the hour, and again at 20 minutes to the hour. For example, at 8am, 8 20am, and 8 40am.

Thanks everyone!

Alexis Keeman

Appendix E. Information sheet and consent form which was given to participants in the experimental group. For those in the control group, no mention of the intervention was made.

Department of Psychology
Telephone: +64 3 366 7001 ext 7500
Email: alexis.keeman@pg.canterbury.ac.nz
16/09/2015

Image Categorisation Task
Information Sheet for Participants

The researcher is Alexis Keeman, a Masters of Science (Applied) student, conducting her research on the perception of images. This project is being carried out as a requirement of the MSc (Applied) degree.

If you choose to take part in this study, your involvement in this project will be to complete a survey and view a set of pictures. The estimated completion time is no more than 20 minutes. You will then be asked to take part in an intervention for 7 days. You will be sent reminders via text message at certain times throughout the period of The Game. As a follow-up to this investigation, you will be asked to complete the same task again in one weeks' time. Participation is voluntary and you have the right to withdraw at any stage without penalty. You may ask for your raw data to be returned to you or destroyed at any point. If you withdraw, information relating to you will be removed. However, once analysis of raw data starts on Monday 19th October, it will not be possible to remove your data.

The results of the project may be published, but you may be assured of the complete confidentiality of data gathered in this investigation: your identity will not be made public. To ensure confidentiality, all data and individual results cannot be traced back to the participant. Alexis and her supervisors, Dr Katharina Naswall, Dr Joana Kuntz, and Dr Sanna Malinen, will be the only people with access to the data. Katharina Naswall can be contacted at katharina.naswall@canterbury.ac.nz or +64 3 364 2552. She will be pleased to discuss any concerns you may have about participation in the project. Data will be destroyed after ten years following dissertation completion. A dissertation is a public document and will be available through the UC Library.

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee, and participants should address any complaints to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

By beginning this study, I agree to participate in this research project.

Image Categorisation Task
Consent Form for Participants

☐ I have been given a full explanation of this project and have had the opportunity to ask questions.

☐ I understand what is required of me if I agree to take part in the research.

☐ I understand that I will be sent reminders via text message over the course of the study and agree to provide my cell phone number for this purpose _____.

☐ I understand that participation is voluntary and I may withdraw at any time without penalty. Withdrawal of participation will also include the withdrawal of any information I have provided should this remain practically achievable.

☐ I understand that any information or opinions I provide will be kept confidential to the researcher and that any published or reported results will not identify the participants or the University of Canterbury.

☐ I understand that a dissertation is a public document and will be available through the UC Library.

☐ I understand that all data collected for the study will be kept in locked and secure facilities and/or in password protected electronic form and will be destroyed after ten years.

☐ I understand that I am able to receive a report on the findings of the study by contacting the researcher at the conclusion of the project.

☐ I understand that I can contact the researcher Alexis Keeman (alexis.keeman@pg.canterbury.ac.nz) or supervisor Katharina Naswall (katharina.naswall@canterbury.ac.nz) for further information. If I have any complaints, I can contact the Chair of the University of Canterbury Human Ethics Committee, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz)

☐ I would like a summary of the results of the project

☐ By signing below, I agree to participate in this research project.
Name:_____ Signed:_____ Date:_____

Appendix F. Email sent to experimental group participants after completing Time 1.

Hey there!

Thank you for taking part in my research!

Don't forget that you need to start playing The Wellbeing Game! Here is the link to the game: https://www.thewellbeinggame.org.nz/ and here is a link to information on The Five Ways to Wellbeing: http://www.mentalhealth.org.nz/home/ways-to-wellbeing/

When signing up, don't forget to **begin your real name with your participant number** - send me an email if you have forgotten yours. Once you have set up your profile, you will be asked to complete a wellbeing survey. Please complete this survey before beginning the game.

Once you have finished this survey, you will be given some team options. Select '**create a new team and join it'**. You will be playing as an individual. You will need to come up with a team name - this can be anything you like. When prompted, select tertiary education, and the name of our organisation is **UC experiment**. Once you complete this stage, you are able to play the game by clicking the 'play' tab at the top of the screen. The game will explain how to log activities.

As a part of this experiment, you need to **log at least one activity each day**, however you are welcome to log as frequently as you wish.

Please ask any questions you may have, otherwise, have fun!

Best,

Alexis

Appendix G. Debrief information which was read to participants after completing Time 2.

Thank you for taking part in my research. I really appreciate it. Now that both phases are complete, I can tell you the aim of this study. I am investigating whether The Wellbeing Game can effectively increase wellbeing. This study had two groups. Those of you who played The Wellbeing Game were in the experimental group, and those of you who did not do anything between now and last week were in the control group. I am hoping to see an increase in wellbeing and a decrease in stress for those who played The Game, and no change for those who did not play The Game. I also think that after having played The Game, those who played will place more pictures in the positive category compared to those who did not play.

If you have any friends who are taking part in this study, please do not discuss it until after they have also completed the second task as this may affect the results.

Does anyone have any questions?

Appendix H. Email sent to participants in Study 2 from the organisation's Wellbeing Champion on behalf of the Mental Health Foundation.

Greetings all Wellbeing Game participants!

We are delighted you have decided to boost your wellbeing by playing The Wellbeing Game. Here are just a few things to note ahead of launch day so that everyone at your workplace will have a fun and successful Wellbeing Game experience.

Getting Started
For team leaders: Setting up your team is very straight forward, and it will take you about 5 minutes. We have a quick-start guide for you here.
For team members: After your team leader sets up your team, you will get a join-up link sent to your email from The Wellbeing Game. Click on the link, get set up and you will be ready to play in no time!

The Wellbeing Game co-ordinator at your workplace has likely already let you know when your Game is kicking off (game play commences Monday XX March) and how long you are playing for (one month, finishing on Friday XX April). You may like to get your teams all set up ahead of your Game kick-off day!

We love feedback! So please email us with anything you think we can improve gamehelp@mentalhealth.org.nz.

Enjoy!
Your friendly Wellbeing Game development team

Appendix I. Email sent to participants in Study 2 after the month of Game-Play had finished.

Kia ora Wellbeing Game gamers,

This is just a follow-up note to say we hope you all enjoyed playing The Wellbeing Game! Here are some notable facts from your Game:

Totes Amazeballs took out the competition with 425 hours and 10 minutes of wellbeing time with 6 players in their team! They we followed with a silver medal win by **Team Awesome Nailed It** with 371 hours and 20 minutes and 4 players—a sterling effort by both teams!

All in all HPA had **11 teams** log over **1596 hours**, which amounts to 66.5 days of continuous wellbeing time!

Post-game survey: Before you go, please visit The Game for a final time to take our post-Game wellbeing survey. If the survey doesn't trigger when you head back you may just need to log out, then log back in again to bring it up. This is really important to our ongoing evaluation. Thanks!

Post-game feedback: Our next move here at Game HQ is a big look/feel redesign to keep the Game fresh and exciting. If you have any feedback on what you'd really like to see added to the Game, please let us know gamehelp@mentalhealth.org.nz.

Thanks again, and remember to keep reflecting on what keeps you well and sharing the good stuff with your team!

Ka kite anō,

The Wellbeing Game Development Team