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All work and no play: A structured play program to improve adult wellbeing

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KEYWORDS

Play
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ABSTRACT

The importance of play for childhood development has long been recognized, but its benefits for adults have received far less attention. Play remains crucial throughout the lifespan due to the significant role it plays in predicting adult wellbeing; and as global happiness continues to decline, the need for affordable and accessible wellbeing interventions have never been greater. This study aimed to investigate the wellbeing benefits of a structured one-hour play program in a sample of 15 teachers and parents aged 28 to 58 years from a primary school community in metropolitan Melbourne. Jugar Life, a play program with activities focussing on evidence-based principles of laughter, social interaction, and flow, collaborated with this research. Using a quantitative pre-experimental within-subjects pre-test/post-test research design, participants completed the Positive and Negative Affect Schedule, the Subjective Vitality Scale, and the Mindful Attention Awareness Scale, immediately before and after the program. The results of dependent samples t-tests indicated large and significant increases in positive affect, subjective vitality, and state mindfulness, in addition to decreases in negative affect. These preliminary findings aim to generate interest in the further development of the play program and ignite broader research into the often overlooked, yet fascinating field of adult play.

As global happiness and life satisfaction decline (Helliwell et al., 2023), social isolation, loneliness, and mental health issues continue to rise (World Health Organization, 2022). A recent estimate places the economic burden of mental ill-health in Australia at $40 to $70 billion annually (Productivity Commission, 2020), with an additional $13 billion attributed to the COVID-19 pandemic (Zhao et al., 2022). Increasing productivity demands (Evenstad, 2015), cost of living pressures (Broadbent et al., 2023), and the growing popularity of our online presence (Kannan & Veazie, 2023), are among the factors contributing to this sustained decline in wellbeing. Consequently, the study of wellbeing interventions has flourished, particularly in the field of positive psychology, including practices such as gratitude and mindfulness (Carr et al., 2021; Portocarrero et

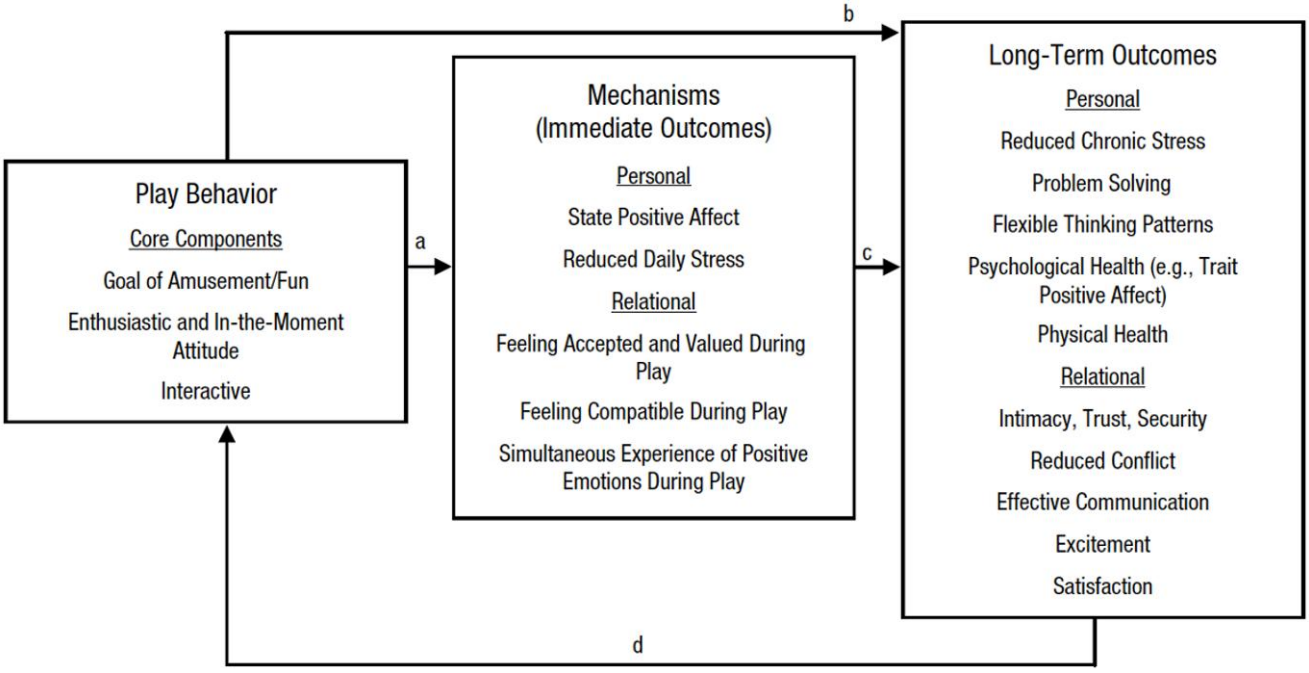
al., 2020). However, despite this surge in interest and the global demand for affordable and accessible wellbeing interventions, one aspect of adult wellbeing that has been largely unexplored by researchers is play.

Defining Adult Play

A uniform definition of adult play has long evaded play scholars (Sutton-Smith, 1997). Various descriptions have been suggested, ranging from those broad enough to include any mere act of leisure for example reading, gardening or playing sports (Stephenson & Sutton-Smith, 1988), to excessively narrow interpretations that exclude many genuine acts of play that lack elements such as spontaneity or social interaction, which may be considered as central to play (Brown & Vaughan, 2010). Addressing this lack of consensus, Van Vleet and Feeney (2015) proposed their model of the effects of play in adulthood. Van Fleet and Feeney (2015) defined play as "an activity or behaviour that (a) is carried out with the goal of amusement and fun, (b) involves an enthusiastic and in-the-moment attitude or approach, and (c) is highly interactive among play partners or with the activity itself" (p. 640). Further, Van Fleet ad Feeney (2015) posit that adult play produces both immediate and long-term personal and relational benefits. This framework has since been recognized and adopted among a growing number of researchers (Bakker et al., 2020; Petelczyc et al., 2018; Tsekleves et al., 2018), including the present study.

Figure 1

Van Vleet and Feeney's Model of the Effects of Play in Adulthood



Note. From "Young at Heart – A Perspective for Advancing Research on Play in Adulthood," by M. Van Vleet and B. C. Feeney, 2015, *Perspectives on Psychological Science*, *10*(5), p. 640. (https://doi.org/10.1177/1745691615596789)

The benefits of Play

Play is widely acknowledged as an innate and essential component of healthy childhood development (Yogman et al., 2018) and play is a strong predictor of cognitive, physical, social, and emotional wellbeing in children (Jeong, 2019; Lee et al., 2020). However, the benefits of play in adults are far less understood (McLean et al., 2022). Some argue that the developmental benefits of play in childhood have created a false dichotomy between child and adult play (Brown & Stenros, 2018). Consequently, there has been a long-standing societal misconception that adults who engage in play have not reached full maturity and are perceived as unproductive (Brown & Vaughan, 2010), resulting in stigma and avoidance (Walsh, 2019). A considerable dearth of investigation into the benefits of adult play has done little to remedy this, leading scholars to argue that play remains equally crucial across the lifespan due to the significant role it plays in development, as well as predicting adult wellbeing (Brown & Vaughan, 2010; Gray, 2009; Van Vleet & Feeney, 2015). The benefits of adult play can be as diverse as the activities that one is engaged in (Iwasaki et al., 2005). For example, playing ping-pong at the office enhances concentration and alertness (Hertting et al., 2020), board games with friends promotes group bonding (Isakson-Lyerly, 2022), or a game of fetch with a canine companion reduces anxiety (Wołyńczyk-Gmaj et al., 2021). Yet, despite findings suggesting its importance, adult play remains significantly underrepresented in the wellbeing literature (Brown & Stenros, 2018).

Mechanisms of Adult Play

Play in adults relates positively to different indicators of wellbeing. Research has demonstrated that some of the mechanisms theorized to contribute to the wellbeing benefits of adult play include laughter (Bryant & Bainbridge, 2022), social interaction (Krach et al., 2010), and flow (Burt & Gonzalez, 2021).

Laughter

Much like play, laughter is a universal and innate behaviour recognized for its positive impact on wellbeing (Bryant & Bainbridge, 2022; Hamayon, 2016; Scott et al., 2022). Neurobiological studies have shown that laughter triggers the release of dopamine, endorphins, and serotonin (Akimbekov & Razzaque, 2021; Cheng et al., 2020), promoting elevated mood and reduced stress (Kuiper & Martin, 1998; Mora-Ripoll, 2010; Yim, 2016). In a longitudinal study by Svebak et al. (2010) of over 50,000 Norwegian adults found a positive association between humour and improved survival into retirement, suggesting increased vitality. Observational studies indicate that people are 30 times more likely to laugh in the presence of others (Wood et al., 2022), supporting the social bonding theory of laughter (Dunbar, 2022).

Social Interaction

Social interaction, the act of engaging socially with others (Harris & Orth, 2020), is essential for human existence, providing a sense of belonging and support (Hall et al., 2022). Like laughter, it triggers a cocktail of neurotransmitters that control our response to stress and anxiety (Krach et al., 2010). However, research has suggested these neurological benefits do not extend to online interactions (Twenge et al., 2019). Studies have shown negative associations between social interaction frequency, depressed mood, and loneliness (Kuczynski et al., 2022), as well as positive associations with positive affect and vitality (Csikszentmihalyi & Hunter, 2003). Additionally, Shor and Roelfs' (2015) meta-analysis examining all-cause mortality risk estimates found that social contact was associated with greater longevity; however, this effect was small and only significant for females. This gender disparity is frequently observed in the literature, indicating that females tend to place more value on social interactions than males (Borland et al., 2019; Friebel et al., 2021).

Flow

The concept of flow, defined by a state of complete immersion in an activity (Csikszentmihalyi, 1991), has gained popularity in positive psychology for its wellbeing benefits. Like laughter and social interaction, flow is associated with neurobiological changes related to pleasure and stress reduction (Harris et al., 2017; Kotler et al., 2022). Engaging in flow-promoting activities positively predicts positive affect (Engeser & Baumann, 2016; Rogatko, 2009), subjective wellbeing (Burt & Gonzalez, 2021; Wu et al., 2021), and self-control (Bertrams, 2021), a key component of subjective vitality (Tse et al., 2022). Flow is characterized by diminished self-awareness, timelessness, and effortless concentration (Csikszentmihalyi & Lebuda, 2017). Whilst the conditions required to induce a state of flow are person and activity dependent (Gold & Ciorciari, 2020; Villines, 2022), mindfulness training has been shown to enhance flow state in athletes from Taiwan (Chen et al., 2018), Ireland (Aherne et al., 2011) and China (Liu et al., 2021).

This study explored the wellbeing benefits of a structured one-hour play program, immediately before and after the program, in a sample of teachers and parents from a primary school community in metropolitan Melbourne. The aim of this study was to establish preliminary data to guide program theory and provide recommendations for play program refinement.

Methods

Play Program

Jugar Life The School of Play is a play consulting organization from Melbourne Australia, that aims to transform the essence of play into a powerful health and well-being tool. The organization is dedicated to nurturing essential skills in children, adults, and families, to empower them to navigate life's challenges with

resilience and joy while fostering autonomy in health and well-being for a brighter, more playful future.

Jugar Life The School of Play promotes the wellbeing benefits of play in schools, sporting clubs, and corporate entities. The organization actively engaged with La Trobe University to obtain data to support their program. The one-hour play program incorporated in this research was theoretically driven by evidence-based principles of laughter, social interaction, and flow. Hosted by the Jugar Life CEO, the program included nine fast-paced play activities, with the initial activities designed to remove potential barriers to engagement (e.g., feelings of anxiety or apprehension) and encourage full engrossment in the session. Participants engaged with play activities firstly as individuals, then as pairs, then finally in teams

Participants

Participants were a self-selected convenience sample of 15 teachers and parents from a local primary school community within metropolitan Melbourne. Participants were aged 28 to 58 years (M = 43.1, SD = 7.8) and recruited via an advertisement in the online school newsletter. All participants were required to be English-literate residents of Victoria, aged over 18 years and the teacher or parent/guardian of an enrolled student. Individuals who had previously participated in the play program prior to data collection and those with a pre-existing relationship with the researcher team and/or program host were excluded from the research. No incentive was offered for participation. A summary of sociodemographic characteristics is shown in Table 1.

Table 1

Sociodemographic Characteristics of Participants

Demographic	Sub-Category	*n* (%) (unless otherwise indicated)
Gender	Female	12 (80)
	Male	3 (20)
Age (years)	Mean (*SD*)	43.1 (7.8)
Connection	Teacher	11 (73.3)
	Parent	4 (26.7)
Highest education level	Undergraduate degree	9 (60)
	Postgraduate degree or higher	6 (40)
Annual household income	$50,000 - $125,000	6 (40)
	$125,001 - $200,000	3 (20)
	$200,001 or higher	3 (20)
	Prefer not to answer	3 (20)
Relationship status	Married/partnered	12 (80)
	Single	2 (13.3)
	Separated/widowed	1 (6.7)

Note. N = *15*, SD = *standard deviation.*

Measures

Sociodemographic Characteristics: Participants were asked questions relating to gender, age, connection (i.e., teacher or parent), education level, household income, and relationship status to obtain sociodemographic characteristics and to ensure inclusion/exclusion criteria were met.

Positive and Negative Affect Schedule *(PANAS):* The PANAS is a 20-item self-report measure of state-based Positive Affect (PA) and Negative Affect (NA) (Watson et al., 1988) comprising of two subscales: 10 items measuring PA (PANAS-PA; e.g., *"enthusiastic, interested, excited"*) and 10 items measuring NA (PANAS-NA; e.g., "*upset, guilty, nervous"*). Participants rated the extent to which they were feeling each affect in the present moment on a 5-point Likert scale ranging from 1 (*very slightly or not at all*) to 5 (*extremely*). Scores for each dimension were summed, with higher scores indicating higher levels of PA and NA. The measure has demonstrated good internal consistency on PA (α = .86 to .9) and NA (α = .84 – .87) subscales, and good test-retest reliability across various adult and non-clinical populations (Crawford & Henry, 2004; Merz et al., 2013; Pires et al., 2013).

Subjective Vitality Scale *(SVS):* The SVS is a 7-item self-report measure of state-based subjective vitality (Bostic et al., 2000;). Participants rated how true each item was for them in the present moment (e.g., "*I feel energized right now*") on a 7-point Likert scale ranging from 1 (*not at all true*) to 7 (*very true*). Higher scores indicate higher levels of subjective vitality. Consistent with prior research (Castillo et al., 2017), item 2 (*I don't feel very energetic right now*) was excluded due to low correlations with the other items. The SVS has demonstrated good internal consistency (α = .84 to .9) and test-retest reliability (Bertrams et al., 2020; Delgado-Lobete et al., 2020).

Mindful Attention Awareness Scale *(MAAS):* The MAAS is a 5-item self-report measure of state mindfulness (Brown & Ryan, 2003;). Participants rated the degree to which they were having each experience (e.g., *"I was preoccupied with the future or the past"*) on a 7-point Likert scale ranging from 0 (*not at all*) to 6 (*very much*) during the past hour and during the program at pre-test and post-test, respectively. All items were reverse scored with higher scores indicating higher state mindfulness. The MAAS has been shown to support a single-factor structure (Schut & Boelen, 2017) with good internal consistency (α = .82 to .93) and test-retest reliability (Carlson et al., 2005; Gonzalez-Blanch et al., 2021; Soler et al., 2012).

Procedure

Following ethics approval, the study was advertised in the online school newsletter of the host primary school in metropolitan Melbourne. Interested participants were invited to take part in a one-hour play program held at the school in an indoor assembly area at the conclusion of the school day. The total duration of study participation was 90-minutes, which allowed for 15-minutes before and after the program for the completion of

pre-test and post-test questionnaires. At the commencement of the play program, interested participants were handed a three-digit ID number and were instructed to scan a QR code using their smart device. This QR code directed participants to the Participant Information and Consent Form on the REDCap platform. Once participants had consented to take part in the research, they entered their ID number and completed the pre-test measures in the order of sociodemographic characteristics, PANAS, SVS, and MAAS. The participants then actively engaged in the Play Program delivered by Jugar Life. After the immediate conclusion of the program, participants scanned a new QR code and completed post-test measures in the same order as pre-test. To ensure accurate reporting, pre-test and post-test questionnaires had a 30-minute expiry limit from the start and end of the program, respectively.

Data analysis

Scores on the PANAS-PA and PANAS-NA were summed, while scores on the SVS and MAAS were averaged. Change scores were computed by subtracting pre-test scores from post-test scores. The cleaned dataset was exported into Jamovi for assumption testing and analysis.

Assumption Testing: Univariate normality of the wellbeing change scores was assessed using the Shapiro-Wilk test, which was the most appropriate method for small samples (N = < 50; Mishra et al., 2019). All four wellbeing measures showed non-significant results, indicating that the sample distributions were not significantly different from a normal distribution. Skew and kurtosis levels were also within acceptable limits for a t-test (skew < 2.0 and kurtosis < 7.0; Kim, 2013). Furthermore, a visual inspection of Q-Q plots confirmed acceptable normality. Therefore, the assumption of normally distributed differences was satisfied

A visual inspection of box plots revealed a small number of statistical outliers in the change scores for the PANAS-PA (n = 3), SVS (n = 2), and MAAS (n = 2). Outliers were identified as data points beyond the 95% confidence interval of the mean (Brakenhoff et al., 2018). These outliers were determined to be true scores rather than measurement errors. Similar results were obtained when outliers were excluded, but with less statistical power. The decision was therefore made to retain them.

Null Hypothesis Testing: All four hypotheses were tested using one-tailed dependent samples t-tests to compare pre-test and post-test mean for each wellbeing measure. A significance level of $\alpha = .05$ was set for all analyses. Although the non-parametric Wilcoxon signed-rank test was considered due to the presence of outliers, research has shown this test to be underpowered in small samples (N = < 30; Akeyede et al., 2014) compared to the more robust students t-test, provided the assumption of normally distributed differences is met (Krzywinski & Altman, 2014).

Sample Size and Power Analysis: Due to the lack of data on similar play-based interventions, an a-priori power analysis was not conducted (Sapra, 2022). Instead, the intended sample size (N = 28) was determined based on a sensitivity analysis, which found that a sample of 28 would be needed to detect a medium effect size of d = 0.5 (Cohen, 1992) for a one-tailed dependent samples t-test with adequate power (1 – β = .8, α = .05); however, the achieved sample size (N = 15) was considerably smaller.

Results

Given the limited sample size, sociodemographic variables were merged into two groups each for improved clarity in comparing wellbeing change scores (Cooksey, 2020). McDonald's omega coefficient was used to estimate the measurement reliability of each wellbeing scale, as it is based on a one-factor model and is more robust against non-normal distributions compared to Cronbach's alpha (Deng & Chan, 2017). Descriptive statistics and internal reliability coefficients for wellbeing scales are shown in Table 4. Internal consistency is considered acceptable if ω = .7 or higher (McNeish, 2018).

Table 4:
Descriptive Statistics and Internal Reliability Results for Pre-test, Post-test, and Change Scores on Wellbeing Scales

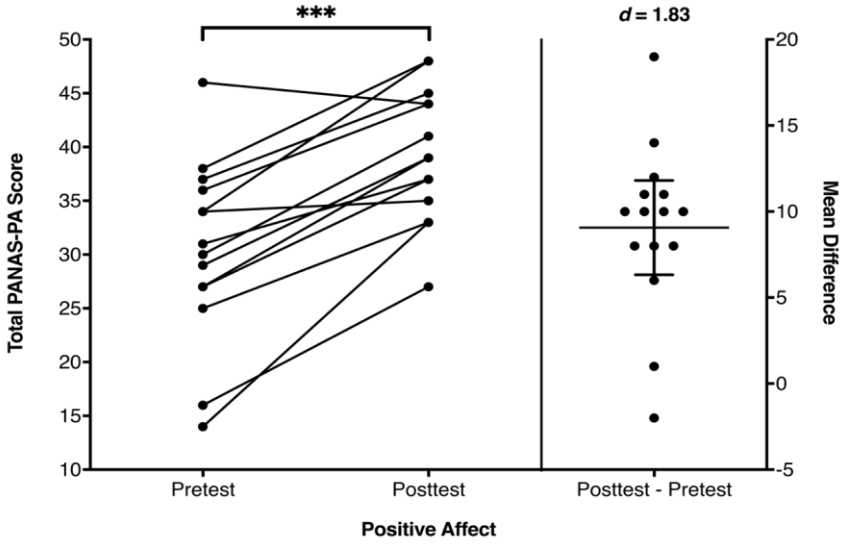
Scale	Variable	*n*	*M*	*SD*	ω
PANAS-PA	Pre-test	15	30.2	8.17	.94
	Post-test	15	39.27	5.92	.93
	Change	15	9.07	4.95	.79
PANAS-NA	Pre-test	15	13.7	3.24	.84
	Post-test	15	10.9	1.6	.91
	Change	15	-2.8	2.37	.75
SVS	Pre-test	15	3.84	1.27	.94
	Post-test	15	5.38	1.02	.97
	Change	15	1.53	1.14	.92
MAAS	Pre-test	11	3.42	1.21	.89
	Post-test	11	4.51	1.26	.82
	Change	11	1.09	1.07	.61

Note. n = sample size, M = mean, SD = standard deviation, ω = McDonald's Omega coefficient, change = pre-test to post-test difference scores. PANAS-PA and PANAS-NA = positive affect and negative affect subscales on the Positive and Negative Affect Schedule, respectively, SVS = Subjective Vitality Scale, MAAS = Mindful Attention Awareness Scale.

To test if the PANAS-PA means would significantly increase from pre-test (M = 30.2, SD = 8.17) to post-test (M = 39.3, SD = 5.92), a one-tailed dependent samples t-test was conducted (n = 15, α = .05). The results showed a significant difference, indicating that the post-test PA mean was significantly higher than the pre-test PA mean, $t(14) = 7.1$, $p<.001$. Cohen's d was estimated at 1.83, 95% CI [0.98, 2.66], indicating a large effect size according to Cohen's (1992) guidelines. Figure 5 shows an estimation plot of pre-test to post-test scores and mean differences, showing that participants reported a significantly higher level of PA after the program when compared to before the program.

Figure 5

Estimation Plot of Total Positive Affect Pre-test and Post-test Scores and Mean Differences

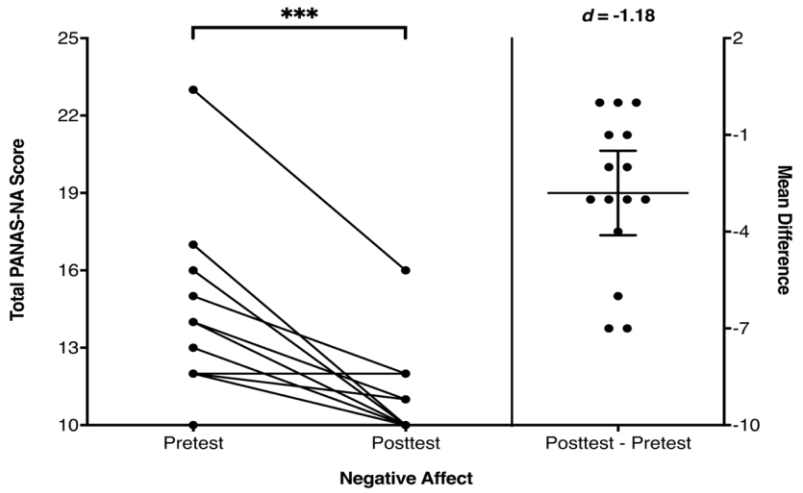


Note. n = 15, d = Cohen's d effect size, PANAS-PA = Positive and Negative Affect Schedule – Positive Affect subscale, mean difference error bars show mean and 95% confidence interval.

A one-tailed dependent samples t-test was conducted (n = 15, α = .05) to test if the PANAS-NA means would decrease from pre-test (M = 13.67, SD = 3.24) to post-test (M = 10.9, SD = 1.6). The results showed a significant difference, indicating that the post-test NA mean was significantly lower than the pre-test NA mean, $t(14) = 4.58$, $p<.001$. Cohen's d was estimated at 1.18, 95% CI [-1.84, -0.5], indicating a large effect size according to Cohen's (1992) guidelines. Figure 6 shows an estimation plot of pre-test to post-test scores and mean differences. These findings indicate that participants reported a significantly lower level of NA after the program when compared to before the program.

Figure 6

Estimation Plot of Total Negative Affect Pre-test to Post-test Scores and Mean Difference

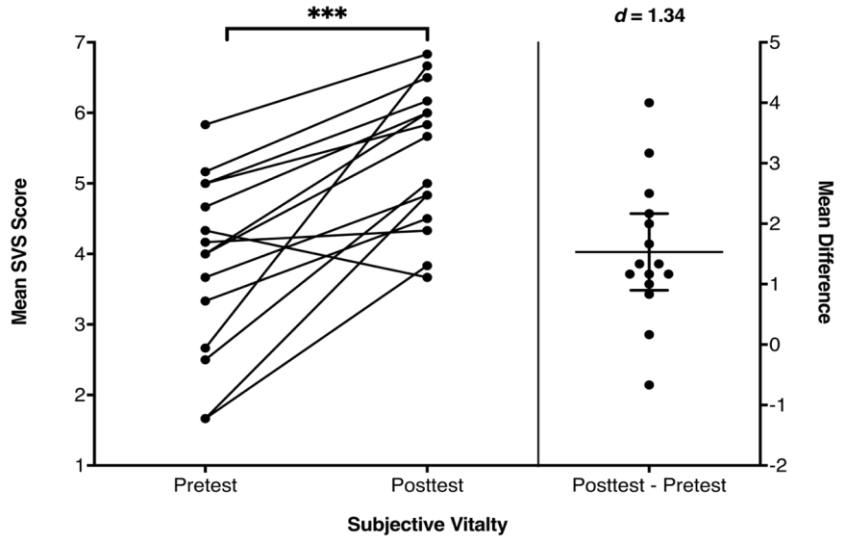


Note. n = 15, d = Cohen's d effect size, PANAS-NA = Positive and Negative Affect Schedule – Negative Affect subscale, mean difference error bars show mean and 95% confidence interval

A one-tailed dependent samples *t*-test was conducted ($n = 15$, $\alpha = .05$) to test if SVS means would significantly increase from pre-test ($M = 3.84$, $SD = 1.27$) to post-test ($M = 5.38$, $SD = 1.02$). The results showed a significant difference, indicating that the post-test SVS mean was significantly higher than the pre-test SVS mean, $t(14) = 5.2$, $p<.001$.

Cohen's *d* was estimated at 1.34, 95% CI [0.62, 2.04], indicating a large effect size according to Cohen's (1992) guidelines. Figure 7 shows an estimation plot of pre-test to post-test scores and mean differences. These findings indicate that participants reported a significantly higher level of subjective vitality after the program when compared to before the program.

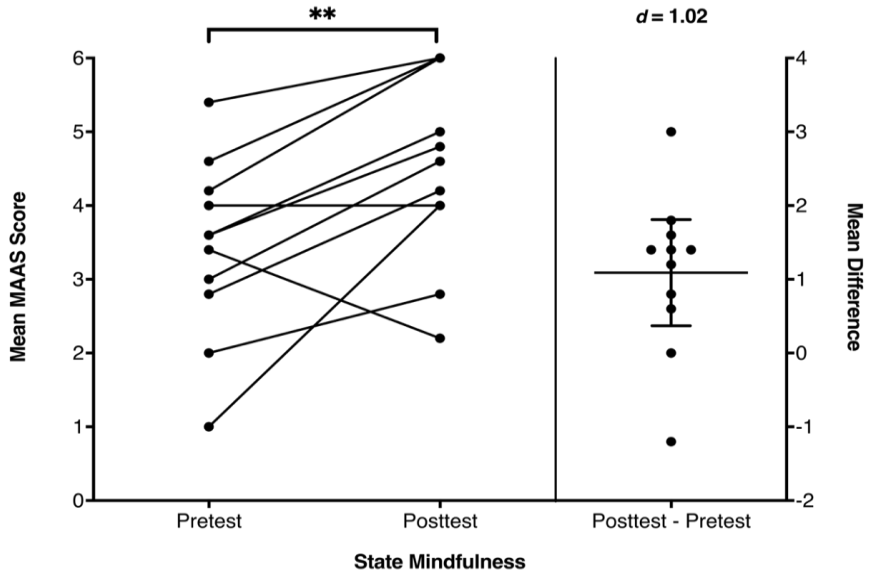
Figure 7
Estimation Plot of Mean Subjective Vitality Scores and Mean Differences



Note. $n = 15$, d = Cohen's d effect size, SVS = Subjective Vitality Scale, mean difference error bars show mean and 95% confidence interval.

A one-tailed dependent samples t-test was conducted ($n = 15$, $\alpha = .05$) to test if the MAAS means would significantly increase from pre-test ($M = 3.42$, $SD = 1.21$) to post-test ($M = 4.51$, $SD = 1.26$). The results showed a significant difference, indicating that the post-test MAAS mean was significantly higher than the pre-test MAAS mean, $t(10) = 3.38$, $p = .004$. Cohen's d was estimated at 1.02, 95% CI [0.27, 1.74], indicating a large effect size according to Cohen's (1992) guidelines. Figure 8 shows an estimation plot of pre-test to post-test scores and mean differences showing that participants reported a significantly higher level of state mindfulness after the program when compared to before the program.

Figure 8
Estimation Plot of Mean State Mindfulness Scores with Mean Difference



Note. $n = 11$, d = Cohen's d effect size, MAAS = Mindful Attention Awareness Scale, mean difference error bars show mean and 95% confidence interval.

Discussion

Engaging in play is believed to be as crucial for adult wellbeing as it is for child development (Brown & Stenros, 2018; Proyer, 2013; Van Vleet et al., 2019). Yet, despite this, investigation into structured adult play is scarce from the literature. This study explored the potential wellbeing benefits of a novel one-hour play program in a sample of teachers and parents from a primary school community. The aim was to establish preliminary data to guide program theory and provide recommendations for play program refinement. Results showed significant increases in PA, subjective vitality, and state mindfulness, and a significant decrease in NA.

Affect

Results showed significant improvements in both PA and NA, consistent with previous play research in adults (Proyer, 2012; Van Vleet et al., 2019), adolescents (Li et al., 2016), and children (Li et al., 2022; Yogman et al., 2018). Internal reliability analyses found the PANAS-PA and PANAS-NA subscales to be reliable, with post-hoc power analyses indicating excellent power for the PANAS-PA and close to sufficient power for the PANAS-NA. Floor effects were observed on the PANAS-NA at pre-test and post-test, which was consistent with previous research indicating that non-depressed individuals typically report low levels of NA (von Klipstein et al., 2023). The implications of these findings for the refinement of play program theory suggest that measurement of NA may not be necessary in nonclinical samples. However, the PANAS-PA proved to be an

appropriate measure, and it is recommended to be included in future structured play research.

Subjective Vitality

Results showed a significant improvement in subjective vitality, consistent with previous adult play research (Guitard et al., 2005; Proyer, 2013). Despite the small sample size, the SVS was sufficiently powered and demonstrated excellent internal reliability on change scores. These findings suggest that the SVS was an acceptable measurement instrument to assess subjective vitality and should also be considered in future structured play research.

State Mindfulness

Results showed a significant improvement in state mindfulness, consistent with previous research in older adults (Lindsay et al., 2022) and children (Lee et al., 2020; Mendizza & Pearce, 2004). However, very little research has focused on middle-aged adults (Mahlo & Windsor, 2021), and none has examined structured play. Measuring mindfulness poses a unique challenge as it is not possible to be present and fully aware of one's experience whilst also answering questions about it. Such a paradox has likely contributed to this lack of investigation (Phan-Le et al., 2022) and raises validity concerns for future implementation. Further, post-hoc tests revealed the MAAS change scores to be underpowered and unreliable, which was most likely a consequence of the small sample size. Taken together, these findings should be interpreted with caution and carefully considered with further development of the program theory.

Context and Considerations for Program Refinement

Understanding the context of an intervention is the first core element of the UK Medical Research Council's complex intervention framework (Skivington et al., 2021). Context refers to the physical, social, cultural, spatial, and ethical features, impacting effectiveness and practical application of the program (Craig et al, 2018). While limited in scope, these findings lay the foundations for future development of the program.

Personality Characteristics

Personality characteristics may also influence the experience of the program. Whilst literature on the relationship between adult play and personality is limited, one core component of play, a willingness to engage socially, has been found to have a positive correlation with extraversion, openness, agreeableness, and conscientiousness, and a negative correlation with neuroticism. (Duffy et al., 2018; Yu et al., 2021). As social interactivity is fundamental to play, it could be hypothesized that individuals with certain personality traits such as low extraversion will derive less benefit from the program due to a lack of enthusiasm, and this is a consideration for future research.

Predisposition to Play

Given how inherent play is to primary school aged children (Clemens & Lincoln, 2018), it is possible that the sample in this study, who regularly interact with children, were more inclined to participate in and respond positively to play compared to those who only interact with other adults. Are adults with more exposure to children more playful? This is an important research question in the context of program development, however currently no known research exists. Whilst potentially having the most to gain, play deprived adults are more likely to have stronger barriers to engage in the program (Brown & Stenros, 2018). Although levels of playfulness among adults varies (Proyer, 2012), understanding the demographics of adults who might be more predisposed to engaging in play is important regarding the generalisability of findings and practical application of the program.

Social Affiliation

Understanding the influence of social affiliation is crucial. Since most of the sample were colleagues (73.3%), the degree of familiarity amongst participants was high. It was therefore unclear whether the program would be similarly experienced with unfamiliar play partners. Research suggests that people are often hesitant to interact with strangers due to their pessimistic expectations of how such interactions will go (Sandstrom et al., 2022). Despite evidence suggesting a significant disparity between this scepticism and the actual enjoyment experienced (Sandstrom & Boothby, 2020), these misconceptions persist. Consequently, it is recommended that future research consider using unfamiliar samples to assess the impact of social affiliation.

Novelty

As those with prior experience with the program were excluded from the study, novelty effects (i.e., amplified benefits due to the play program being fresh and exciting) may be contributing to the magnitude of the observed findings. Whilst novelty effects have not been studied in relation to wellbeing interventions, novelty itself has been shown to lead to improvements in wellbeing (González-Cutre et al., 2016; Kashdan and Silvia, 2009). Therefore, it is not implausible to suppose that repeated program participation may diminish the effects of play mechanisms over time. One study on a gamification intervention revealed a U-shaped pattern in their data, indicating both novelty and familiarity effects (i.e., the amplified benefits due to familiarity; Rodrigues et al. 2022). Therefore, conducting longitudinal studies with repeated participation is warranted to understand the program's practical application.

Energetic Mindfulness?

Mindfulness-based interventions (MBI) have been shown to be effective in clinical and nonclinical samples (Goldberg et al., 2018; Zhang et al., 2021). However, individuals with higher baseline arousal, such as those

with Attention-deficit/hyperactivity disorder (Zylowska et al., 2008) and generalised anxiety disorder (Lomas et al., 2015), often struggle with traditional MBIs like meditation. The heightened state mindfulness observed in the current study could potentially offer an alternative MBI for these individuals. Moreover, the simultaneous increase in subjective vitality unveils the prospect of an intriguing and somewhat contradictory 'energetic mindfulness' mechanism. This challenges conventional notions of mindfulness, which typically involve feelings of calmness, relaxation, and stillness (Bamber & Schneider, 2022). It is suggested that play and well-being researchers explore the potential of this exciting vitality/mindfulness relationship.

Strengths and Challenges

A key strength of this study was the use of a within-subjects design. Each participant acting as their own control eliminated the potential confound of individual differences, ensuring that change scores were attributed to the individuals themselves rather than other issues associated with between-subjects designs. This design also provided greater statistical power, which was crucial given that the achieved sample size was smaller than anticipated. Another strength was the use of psychometrically validated wellbeing instruments which increased the reliability and validity of findings.

However, the study is not without its limitations. Firstly, the achieved sample size was considerably smaller than intended, which limited the ability to conduct exploratory analyses for demographic comparisons and change score relationships. Secondly, as the MAAS was employed in this study to measure both wellbeing and to assess how participants experienced the program, instructions for the pre-test and post-test MAAS were altered to include the retrospective timeframes of "*one hour before the program*", and "*during the program*", respectively. Despite the challenges in measuring state mindfulness, this may have compromised the validity (Berland et al., 2018) and was reflected by the lower internal reliability of the MAAS change scores.

Future Directions

The development of a strong program theory that explains how and why a play program leads to positive changes in wellbeing is instrumental. Qualitative and/or mixed methods designs could be considered to gain more detailed insights into the mechanisms behind these changes (Thirsk and Clark,od 2017). Larger and more diverse samples could be incorporated to conduct more in-depth statistical analyses and broaden the generalizability of findings. Further, the employment of a control condition is recommended to investigate the causal role of play. To enhance the program's development, it is advisable to continue using the UK Medical Research Council's complex intervention framework (Skivington et al., 2021), regardless of the direction taken.

Conclusions

Play has long been recognized as essential for healthy childhood development, but far less is known of its benefits in adults. This study, the first of its kind, aimed to investigate the wellbeing benefits of a structured one-hour adult play program and to lay the initial foundation for its development. Results from a small sample of teachers and parents showed significant improvements in positive and negative affect, subjective vitality, and state mindfulness, after participating in the program. These preliminary findings suggest that structured adult play may be an effective wellbeing intervention, however, the causal mechanisms behind these findings remain unknown. This research hopes to stimulate interest in the play program and catalyse further exploration into the much neglected but fascinating field of adult play.

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References

Aherne, C., Moran, A. P., & Lonsdale, C. (2011). The effect of mindfulness training on athletes' flow: An initial investigation. *The Sport Psychologist*, *25*(2), 177–189. https://doi.org/10.1123/tsp.25.2.177

Akeyede, I., Usman, M., & Chiawa, M. A. (2014). On consistency and limitation of paired t-test, sign and Wilcoxon sign rank test. *IOSR Journal of Mathematics, 10*(1), 1-6. https://doi.org/10.9790/5728-10140106

Akimbekov, N. S., & Razzaque, M. S. (2021). Laughter therapy: A humor-induced hormonal intervention to reduce stress and anxiety. *Current Research in Physiology*, *4*, 135-138. https://doi.org/10.1016/j.crphys.2021.04.002

Bakker, A. B., Scharp, Y. S., Breevaart, K., & de Vries, J. D. (2020). Playful work design:

Introduction of a new concept. *The Spanish Journal of Psychology*, *23*, e19. https://doi.org/10.1017/SJP.2020.20

Bamber, M., & Schneider, J. (2022). College students' perceptions of mindfulness-based interventions: A narrative review of the qualitative research. *Current Psychology*, *41*. https://doi.org/10.1007/s12144-019-00592-4

Berland, L. L., Berland, N. W., & Berland, M. W. (2018). ABR psychometric testing: Analysis of validity and effects. *Journal of the American College of Radiology*, *15*(6), 905-910. https://doi.org/10.1016/j.jacr.2018.02.023

Bertrams, A. (2021). the cognitive association between effortful self-control and decreased vitality. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.631914

Bertrams, A., Dyllick, T. H., Englert, C., & Krispenz, A. (2020). German adaptation of the subjective vitality scales (SVS-G). *Open Psychology*, *2*(1), 57-75. https://doi.org/10.1515/psych-2020-0005

Borland, J. M., Rilling, J. K., Frantz, K. J., & Albers, H. E. (2019). Sex-dependent regulation of social reward by oxytocin: An inverted U hypothesis. *Neuropsychopharmacology*, *44*(1), 97-110. https://doi.org/10.1038/s41386-018-0129-2

Bostic, T. J., McGartland Rubio, D., & Hood, M. (2000). A validation of the subjective vitality scale using structural equation modelling. *Social Indicators Research*, *52*(3), 313-324. https://doi.org/10.1023/A:1007136110218

Brakenhoff, T. B., Roes, K. C. B., Moons, K. G. M., & Groenwold, R. H. H. (2018). Outlier classification performance of risk adjustment methods when profiling multiple providers. *BMC Medical Research Methodology*, *18*(1), 54. https://doi.org/10.1186/s12874-018-0510-1

Broadbent, P., Thomson, R., Kopasker, D., McCartney, G., Meier, P., Richiardi, M., McKee, M., & Katikireddi, S. V. (2023). The public health implications of the cost-of-living crisis: Outlining mechanisms and modelling consequences. *The Lancet Regional Health - Europe*, *27*, 100585. https://doi.org/10.1016/j.lanepe.2023.100585

Brown, A. M. L., & Stenros, J. (2018). Adult play: The dirty secret of grown-ups. *Games and Culture*, *13*(3), 215-219. https://doi.org/10.1177/1555412017690860

Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, *84*(4), 822. https://doi.org/10.1037/00223514.84.4.822

Brown, S., & Vaughan, C. (2010). *Play: How it shapes the brain, opens the imagination, and invigorates the soul.* Penguin Press.

Bryant, G. A., & Bainbridge, C. M. (2022). Laughter and culture. *Philosophical Transactions of the Royal Society B:*, *377*(1863). https://doi.org/10.1098/rstb.2021.0179

Burt, I., & Gonzalez, T. (2021). Flow state as an existential tool to increase optimal experience and life enjoyment. *The Journal of Humanistic Counselling*, *60*(3), 197-214. https://doi.org/10.1002/johc.12165

Carlson, L. E., & Brown, K. W. (2005). Validation of the mindful attention awareness scale in a cancer population. *Journal of Psychosomatic Research*, *58*(1), 29-33. https://doi.org/10.1016/j.jpsychores.2004.04.366

Carr, A., Cullen, K., Keeney, C., Canning, C., Mooney, O., Chinseallaigh, E., & O'Dowd, A. (2021). Effectiveness of positive psychology interventions: A systematic review and meta-analysis. *The Journal of Positive Psychology*, *16*(6), 749-769. https://doi.org/10.1080/17439760.2020.1818807

Castillo, I., Tomás, I., & Balaguer, I. (2017). The Spanish-version of the subjective vitality scale: Psychometric properties and evidence of validity. *The Spanish Journal of Psychology, 20*(E26). https://doi.org/10.1017/sjp.2017.22

Chen, J.-H., Tsai, P.-H., Lin, Y.-C., Chen, C.-K., & Chen, C.-Y. (2018). Mindfulness training enhances flow state and mental health among baseball players in Taiwan. *Psychology Research and Behavior Management, 19*(12), 15-21. https://doi.org/10.2147/PRBM.S188734

Cheng, S. L., Yang, F. C., Chu, H. T., Tsai, C. K., Ku, S. C., Tseng, Y. T., Yeh, T. C., & Liang, C. S. (2020). Incongruent expression of brain-derived neurotrophic factor and cortisol in schizophrenia: Results from a randomized controlled trial of laughter intervention. *Psychiatry Investigation, 17*(12), 1191-1199. https://doi.org/10.30773/pi.2020.0269

Clemens, S. L., & Lincoln, D. J. (2018). Where children play most: Physical activity levels of school children across four settings and policy implications. *Australian and New Zealand Journal of Public Health, 42*(6), 575-581. https://doi.org/10.1111/1753-6405.12833

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*(1), 155-159. https://doi.org/10.1037/0033-2909.112.1.155

Cooksey, R. W. (2020). Descriptive statistics for summarizing data. *Illustrating Statistical Procedures: Finding Meaning in Quantitative Data.* Springer. https://doi.org/10.1007/978-981-15-2537-7_5

Craig, P., Di Ruggiero, E., Frohlich, K. L., Mykhalovskiy, E., White, M., Campbell, R., Cummins, S., Edwards, N., Hunt, K., & Kee, F. (2018). *Taking account of context in population health intervention research: Guidance for producers, users and funders of research.* National Institute for Healthcare Research. https://doi.org/10.17863/CAM.26129

Crawford, J. R., & Henry, J. D. (2004). The positive and negative affect schedule (PANAS): Construct validity, measurement properties and normative data in a large non-clinical sample. *The British Journal of Clinical Psychology, 43*(3), 245-265.

Csikszentmihalyi, M. (1991). *Flow: The psychology of optimal experience: Steps toward enhancing the quality of life.* Harper Collins Publishers.

Csikszentmihalyi, M., & Hunter, J. (2003). Happiness in everyday life: The uses of experience sampling. *Journal of Happiness Studies, 4*(2), 185-199. https://doi.org/10.1023/A:1024409732742

Csikszentmihalyi, M., & Lebuda, I. (2017). A window into the bright side of psychology: Interview with Mihaly Csikszentmihalyi. *European Journal Psychology, 13*(4), 810-821. https://doi.org/10.5964/ejop.v13i4.1482

Delgado-Lobete, L., Montes-Montes, R., Vila-Paz, A., Talavera-Valverde, M.-Á., Cruz-Valiño, J.-M., Gándara-Gafo, B., Ávila-Álvarez, A., & Santos-del-Riego, S. (2020). Subjective well-being in higher education: Psychometric properties of the satisfaction with life and subjective vitality scales in Spanish university students. *Sustainability, 12*(6), 2176. https://doi.org/10.3390/su12062176

Deng, L., & Chan, W. (2017). Testing the difference between reliability coefficients alpha and omega. *Educational and Psychological Mea*surement, *77*(2), 185-203. https://doi.org/10.1177/0013164416658325

Duffy, K. A., Helzer, E. G., Hoyle, R. H., Fukukura Helzer, J., & Chartrand, T. L. (2018). Pessimistic expectations and poorer experiences: The role of (low) extraversion in anticipated and experienced enjoyment of social interaction. *PLoS One, 13*(7), e0199146. https://doi.org/10.1371/journal.pone.0199146

Dunbar, R. I. M. (2022). Laughter and its role in the evolution of human social bonding. *Philosophical Transactions of the Royal Society B:,377*(1863), 20210176. https://doi.org/10.1098/rstb.2021.0176

Engeser, S., & Baumann, N. (2016). Fluctuation of flow and affect in everyday life: A second look at the paradox of work. *Journal of Happiness Studies, 17*(1), 105-124. https://doi.org/10.1007/s10902-014-9586-4

Evenstad, S. B. (2015). "Be excellent and do more with less": A paradox behind job burnout threatening organizational sustainability. *International Journal of Systems and Society, 2*(2), 52-67. http://doi.org/10.4018/IJSS.2015070104

Friebel, G., Lalanne, M., Richter, B., Schwardmann, P., & Seabright, P. (2021). Gender differences in social interactions. *Journal of Economic Behavior & Organization, 186*, 33-45. https://doi.org/10.1016/j.jebo.2021.03.016

Gold, J., & Ciorciari, J. (2020). A review on the role of the neuroscience of flow states in the modern world. *Behavioral Sciences (Basel), 10*(9), 137. https://doi.org/10.3390/bs10090137

Goldberg, S. B., Tucker, R. P., Greene, P. A., Davidson, R. J., Wampold, B. E., Kearney, D. J., & Simpson, T. L. (2018). Mindfulness-based interventions for psychiatric disorders: A systematic review and meta-analysis. *Clinical Psychology Review, 59*, 52-60. https://doi.org/10.1016/j.cpr.2017.10.011

González-Blanch, C., Medrano, L., O'Sullivan, S., Bell, I., Nicholas, J., Chambers, R., Gleeson, J., & Alvarez-Jimenez, M. (2021). Psychometric properties of the mindful attention awareness scale (MAAS) in a first-episode psychosis sample. *Psychological Assessment, 34*(2), 188-196. https://doi.org/10.1037/pas0001077

González-Cutre, D., Sicilia, Á., Sierra, A. C., Ferriz, R., & Hagger, M. S. (2016). Understanding the need for novelty from the perspective of self-determination theory. *Personality and Individual Differences, 102*, 159-169. https://doi.org/10.1016/j.paid.2016.06.036

Gray, P. (2009). Play as a foundation for hunter-gatherer social existence. *American Journal of Play, 1*(4), 476-522. https://files.eric.ed.gov/fulltext/EJ1069037.pdf

Guitard, P., Ferland, F., & Dutil, É. (2005). Toward a better understanding of playfulness in adults. *OTJR: Occupational Therapy Journal of Research*, *25*(1), 9-22. https://doi.org/10.1177/153944920502500103

Hall, J. A., Pennington, N., & Merolla, A. J. (2022). Which mediated social interactions satisfy the need to belong? *Journal of Computer-Mediated Communication*, *28*(1). https://doi.org/10.1093/jcmc/zmac026

Hamayon, R. (2016). *Why we play: An anthropological study* (Enlarged edition.). HAU Books.

Harris, D. J., Vine, S. J., & Wilson, M. R. (2017). Neurocognitive mechanisms of the flow state. In M. R. Wilson, V. Walsh, & B. Parkin (Eds.), *Progress in Brain Research*, *234*, (pp. 221-243). Elsevier. https://doi.org/10.1016/bs.pbr.2017.06.012

Harris, M. A., & Orth, U. (2020). The link between self-esteem and social relationships: A metaanalysis of longitudinal studies. *Journal of Personality and Social Psychology*, *119*(6), 1459-1477. https://doi.org/10.1037/pspp0000265

Helliwell, J. F., Layard, R., Sachs, J. D., Aknin, L. B., De Neve, J.-E., & Wang, S. (Eds.). (2023). *World Happiness Report 2023 (11th ed.)*. Sustainable Development Solutions Network. https://happiness-report.s3.amazonaws.com/2023/WHR+23.pdf

Hendriks, T., de Jong, J., & Cramer, H. (2017). The effects of yoga on positive mental health among healthy adults: A systematic review and meta-analysis. *The Journal of Alternative and Complementary Medicine*, *23*(7), 505-517. https://doi.org/10.1089/acm.2016.0334

Hertting, K., Holmquist, M., & Parker, J. (2020). Ping pong for health: The meaning of space in a sport-based health intervention at the workplace. *International Journal of Qualitative Studies on Health and Well-being*, *15*(sup1), 1689602. https://doi.org/10.1080/17482631.2019.1689602

Isakson-Lyerly, S. A. (2022). *Adult play and wellbeing: A moderated mediation model* (Publication No. 29162852) [Doctoral dissertation, Fielding Graduate University]. ProQuest Dissertations Publishing. https://www.proquest.com/docview/2656825358?pqorigsite=gscholar&fromopenview=true

Iwasaki, Y., MacTavish, J., & MacKay, K. (2005). Building on strengths and resilience: Leisure as a stress survival strategy. *British Journal of Guidance & Counselling*, *33*(1), 81-100. https://doi.org/10.1080/03069880412331335894

Jeong, Y. M. (2019, June 30). A meta-analysis of the developmental effect of play in early childhood. *Korean Journal of Child Education and Care*, *19*(2).145-163. https://doi.org/10.21213/kjcec.2019.19.2.145

Kannan, V. D., & Veazie, P. J. (2023). US trends in social isolation, social engagement, and companionship – nationally and by age, sex, race/ethnicity, family income, and work hours, 2003–2020. *SSM - Population Health*, *21*,1013331. https://doi.org/10.1016/j.ssmph.2022.101331

Kashdan, T. B., & Silvia, P. J. (2009). Curiosity and interest: The benefits of thriving on novelty and challenge. *Oxford Handbook of Positive Psychology*, *2*, 367-374. https://doi.org/10.1093/oxfordhb/9780195187243.013.0034

Kim, H. Y. (2013). Statistical notes for clinical researchers: Assessing normal distribution using skewness and kurtosis. *Restorative Dentistry and Endodontics*, *38*(1), 52-54. https://doi.org/10.5395/rde.2013.38.1.52

Kotler, S., Mannino, M., Kelso, S., & Huskey, R. (2022). First few seconds for flow: A comprehensive proposal of the neurobiology and neurodynamics of state onset. *Neuroscience & Biobehavioral Reviews*, *143*, 104956. https://doi.org/10.1016/j.neubiorev.2022.104956

Krach, S., Paulus, F. M., Bodden, M., & Kircher, T. (2010). The rewarding nature of social interactions. *Frontiers in Behavioral* Neuroscience, *4*, 22. https://doi.org/10.3389/fnbeh.2010.00022

Krzywinski, M., & Altman, N. (2014). Nonparametric tests. *Nature Methods*, *11*(5), 467-468. https://doi.org/10.1038/nmeth.2937

Kuczynski, A. M., Halvorson, M. A., Slater, L. R., & Kanter, J. W. (2022). The effect of social interaction quantity and quality on depressed mood and loneliness: A daily diary study. *Journal of Social and Personal Relationships*, *39*(3), 734-756. https://doi.org/10.1177/02654075211045717

Kuiper, N. A., & Martin, R. A. (1998). Laughter and stress in daily life: Relation to positive and negative affect. *Motivation and Emotion*, *22*(2), 133-153. https://doi.org/10.1023/A:1021392305352

Lee, R. L. T., Lane, S., Brown, G., Leung, C., Kwok, S. W. H., & Chan, S. W. C. (2020). Systematic review of the impact of unstructured play interventions to improve young children's physical, social, and emotional wellbeing. *Nursing & Health Sciences*, *22*(2), 184-196. https://doi.org/10.1111/nhs.12732

Li, J., Huang, Z., Si, W., & Shao, T. (2022). The effects of physical activity on positive emotions in children and adolescents: A systematic review and meta-analysis. *International Journal of Environmental Research and Public Health*, *19*(21). https://doi.org/10.3390/ijerph192114185

Li, W. H. C., Chung, J. O. K., Ho, K. Y., & Kwok, B. M. C. (2016). Play interventions to reduce anxiety and negative emotions in hospitalized children. *BMC Pediatrics*, *16*(1), 36. https://doi.org/10.1186/s12887-016-0570-5

Lindsay, E. K., Creswell, J. D., Stern, H. J., Greco, C. M., Walko, T. D., Dutcher, J. M., Wright, A. G. C., Brown, K. W., & Marsland, A. L. (2022). Mindfulness-based stress reduction increases stimulated IL-6 production among lonely older adults: A randomized controlled trial. *Brain, Behaviour and Immunity*, *104*, 6-15. https://doi.org/10.1016/j.bbi.2022.05.001

Liu, F., Zhang, Z., Liu, S., & Zhang, N. (2021). Examining the effects of brief mindfulness training on athletes' flow: The mediating role of resilience. *Evidence - Based Complementary and Alternative Medicine, 2021, 6633658.* https://doi.org/10.1155/2021/6633658

Lomas, T., Cartwright, T., Edginton, T., & Ridge, D. (2015). A qualitative analysis of experiential challenges associated with meditation practice. *Mindfulness, 6*(4), 848-860. https://doi.org/10.1007/s12671-014-0329-8

Mahlo, L., & Windsor, T. D. (2021). State mindfulness and affective well-being in the daily lives of middle-aged and older adults. *Psychology and Aging, 36*(5), 642-659. https://doi.org/10.1037/pag0000596

McLean, K., Lake, G., Wild, M., Licandro, U., & Evangelou, M. (2022). Perspectives of play and play-based learning: What do adults think play is? *Australasian Journal of Early Childhood, 48*(1), 5-17. https://doi.org/10.1177/18369391221130790

McNeish, D. (2018). Thanks coefficient alpha, we'll take it from here. *Psychological Methods, 23*(3), 412-433. https://doi.org/10.1037/met0000144

Mendizza, M., & Pearce, J. C. (2004). *Magical Parent, Magical Child: The Art of Joyful Parenting.* North Atlantic Books.

Merz, E. L., Malcarne, V. L., Roesch, S. C., Ko, C. M., Emerson, M., Roma, V. G., & Sadler, G. R. (2013). Psychometric properties of positive and negative affect schedule (PANAS) original and short forms in an African American community sample. *Journal of Affective Disorders, 151*(3), 942-949. https://doi.org/10.1016/j.jad.2013.08.011

Mishra, P., Pandey, C. M., Singh, U., Gupta, A., Sahu, C., & Keshri, A. (2019). Descriptive statistics and normality tests for statistical data. *Annals of Cardiac Anaesthesia, 22*(1), 67-72. https://doi.org/10.4103/aca.ACA_157_18

Mora-Ripoll, R. (2010). The therapeutic value of laughter in medicine. *Alternative Therapies in Health and Medicine, 16*(6), 56-64. https://doi.org/10.1016/j.ctcp.2020.101252

Petelczyc, C. A., Capezio, A., Wang, L., Restubog, S. L. D., & Aquino, K. (2018). Play at work: An integrative review and agenda for future research. *Journal of Management, 44*(1), 161-190. https://doi.org/10.1177/0149206317731519

Phan-Le, N. T., Brennan, L., & Parker, L. (2022). The search for scientific meaning in mindfulness research: Insights from a scoping review. *PLoS One, 17*(5), e0264924. https://doi.org/10.1371/journal.pone.0264924

Pires, P., Filgueiras, A., Ribas, R., & Santana, C. (2013). Positive and negative affect schedule: psychometric properties for the Brazilian Portuguese version. *The Spanish Journal of Psychology, 16*, E58. https://doi.org/10.1017/sjp.2013.60

Portocarrero, F. F., Gonzalez, K., & Ekema-Agbaw, M. (2020). A meta-analytic review of the relationship between dispositional gratitude and well-being. *Personality and Individual Differences, 164*, 110101. https://doi.org/10.1016/j.paid.2020.110101

Productivity Commission. (2020). *Mental health inquiry report* (95). Australian Government. https://www.pc.gov.au/inquiries/completed/mental-health/report

Proyer, R. T. (2012). Examining playfulness in adults: Testing its correlates with personality, positive psychological functioning, goal aspirations, and multi-methodically assessed ingenuity. *Psychological Test and Assessment Modeling, 54*(2), 103–127.

Proyer, R. T. (2013). The well-being of playful adults: Adult playfulness, subjective well-being, physical well-being, and the pursuit of enjoyable activities. *The European Journal of Humour Research, 1*(1), 84–98. https://doi.org/10.7592/EJHR2013.1.1.proyer

Rodrigues, L., Pereira, F. D., Toda, A. M., Palomino, P. T., Pessoa, M., Carvalho, L. S. G., Fernandes, D., Oliveira, E. H. T., Cristea, A. I., & Isotani, S. (2022). Gamification suffers from the novelty effect but benefits from the familiarization effect: Findings from a longitudinal study. *International Journal of Educational Technology in Higher Education, 19*(1), 13. https://doi.org/10.1186/s41239-021-00314-6

Rogatko, T. P. (2009). The influence of flow on positive affect in college students. *Journal of Happiness Studies, 10*(2), 133-148. https://doi.org/10.1007/s10902-007-9069-y

Sandstrom, G. M., & Boothby, E. J. (2020). Why do people avoid talking to strangers? A mini meta-analysis of predicted fears and actual experiences talking to a stranger. *Self and Identity, 20*(1), 47-71. https://doi.org/10.1080/15298868.2020.1816568

Sandstrom, G. M., Boothby, E. J., & Cooney, G. (2022). Talking to strangers: A week-long intervention reduces psychological barriers to social connection. *Journal of Experimental Social Psychology, 102*, 104356. https://doi.org/10.1016/j.jesp.2022.104356

Sapra, R. L. (2022). How to calculate an adequate sample size? In S. Nundy, A. Kakar, & Z. A. Bhutta (Eds.), *How to practice academic medicine and publish from developing countries? A practical guide* (pp. 81-93). Springer. https://doi.org/10.1007/978-981-16-5248-6_9

Schut, D. M., & Boelen, P. A. (2017). The relative importance of rumination, experiential avoidance and mindfulness as predictors of depressive symptoms. *Journal of Contextual Behavioral Science, 6*(1), 8-12. https://doi.org/10.1016/j.jcbs.2016.11.008

Scott, S. K., Cai, C. Q., & Billing, A. (2022). Robert Provine: The critical human importance of laughter, connections and contagion. *Philosophical Transactions of the Royal Society London B Biological Sciences, 377*(1863), 20210178. https://doi.org/10.1098/rstb.2021.0178

Shor, E., & Roelfs, D. J. (2015). Social contact frequency and all-cause mortality: A metaanalysis and meta-regression. *Social Science & Medicine, 128*, 76-86. https://doi.org/10.1016/j.socscimed.2015.01.010

Skivington, K., Matthews, L., Simpson, S. A., Craig, P., Baird, J., Blazeby, J. M., Boyd, K. A., Craig, N., French, D. P., McIntosh, E., Petticrew, M., Rycroft-Malone, J., White, M., & Moore, L. (2021). A new framework for developing and evaluating complex interventions: Update of Medical Research Council guidance. *BMJ, 374*, n2061. https://doi.org/10.1136/bmj.n2061

Soler, J., Tejedor, R., Feliu-Soler, A., Pascual, J. C., Cebolla, A., Soriano, J., Alvarez, E., & Perez, V. (2012). Psychometric proprieties of Spanish version of mindful attention awareness scale (MAAS). *Actas Esp Psiquiatr, 40*(1), 19-26. https://pubmed.ncbi.nlm.nih.gov/22344492/

Stephenson, W., & Sutton-Smith, B. (1988). *The play theory of mass communication* (Rev. ed.). Transaction Books.

Sutton-Smith, B. (1997). *The ambiguity of play*. Harvard University Press.

Svebak, S., Romundstad, S., & Holmen, J. (2010). A 7-year prospective study of sense of humor and mortality in an adult county population: The HUNT-2 study. *International Journal of Psychiatry in Medicine, 40*(2), 125-146. https://doi.org/10.2190/PM.40.2.a

Thirsk, L. M., & Clark, A. M. (2017). Using qualitative research for complex interventions: the contributions of hermeneutics. *International Journal of Qualitative Methods, 16*(1), 1609406917721068. https://doi.org/10.1177/1609406917721068

Tse, D. C. K., Nakamura, J., & Csikszentmihalyi, M. (2022). Flow experiences across adulthood: Preliminary findings on the continuity hypothesis. *Journal of Happiness Studies, 23*(6), 2517-2540. https://doi.org/10.1007/s10902-022-00514-5

Tsekleves, E., Bingley, A. F., Luján Escalante, M. A., & Gradinar, A. (2018). Engaging people with dementia in designing playful and creative practices: Co-design or co-creation? *Dementia, 19*(3), 915-931. https://doi.org/10.1177/1471301218791692

Twenge, J. M., Spitzberg, B. H., & Campbell, W. K. (2019). Less in-person social interaction with peers among U.S. adolescents in the 21st century and links to loneliness. *Journal of Social and Personal Relationships, 36*(6), 1892-1913. https://doi.org/10.1177/0265407519836170

Van Vleet, M., & Feeney, B. C. (2015). Young at heart: A perspective for advancing research on play in adulthood. *Perspectives on Psychological Science, 10*(5), 639-645. https://doi.org/10.1177/1745691615596789

Van Vleet, M., Helgeson, V. S., & Berg, C. A. (2019). The importance of having fun: Daily play among adults with type 1 diabetes. *Journal of Social and Personal Relationships, 36*(11-12), 3695-3710. https://doi.org/10.1177/0265407519832115

Villines, Z. (2022, March 19). What a flow state is and how to achieve it. *Medical News Today*. https://www.medicalnewstoday.com/articles/flow-state

von Klipstein, L., Servaas, M. N., Lamers, F., Schoevers, R. A., Wardenaar, K. J., & Riese, H. (2023). Increased affective reactivity among depressed individuals can be explained by floor effects: An experience sampling study. *Journal of Affective Disorders, 334*, 370-381. https://doi.org/10.1016/j.jad.2023.04.118

Walsh, A. (2019). Giving permission for adults to play. *Journal of Play in Adulthood, 1*(1), 1-14. https://doi.org/10.5920/jpa.565

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*(6), 1063–1070. https://doi.org/10.1037/0022-3514.54.6.1063

Wolyńczyk-Gmaj, D., Ziółkowska, A., Rogala, P., Ścigała, D., Bryła, L., Gmaj, B., & Wojnar, M. (2021). Can dog-assisted intervention decrease anxiety level and autonomic agitation in patients with anxiety disorders? *Journal of Clinical Medicine, 10*(21). https://doi.org/10.3390/jcm10215171

Wood, A., Templeton, E., Morrel, J., Schubert, F., & Wheatley, T. (2022). Tendency to laugh is a stable trait: Findings from a round-robin conversation study. *Philosophical Transactions of the Royal Society B: Biological Sciences, 377*(1863), 20210187. https://doi.org/10.1098/rstb.2021.0187

World Health Organisation. (2022). *COVID-19 pandemic triggers 25% increase in prevalence of anxiety and depression worldwide*. https://www.who.int/news/item/02-03-2022-covid-19pandemic-triggers-25-increase-in-prevalence-of-anxiety-and-depression-worldwide

Wu, J., Xie, M., Lai, Y., Mao, Y., & Harmat, L. (2021). Flow as a key predictor of subjective well-being among Chinese university students: A chain mediating model. *Frontiers in Psychology, 12*, 743906. https://doi.org/10.3389/fpsyg.2021.743906

Yim, J. (2016). Therapeutic benefits of laughter in mental health: A theoretical review. *Tohoku J Exp Med, 239*(3), 243-249. https://doi.org/10.1620/tjem.239.243

Yogman, M., Garner, A., Hutchinson, J., Hirsh-Pasek, K., Golinkoff, R. M., Baum, R., Gambon, T., Lavin, A., Mattson, G., Wissow, L., Hill, D. L., Ameenuddin, N., Chassiakos, Y. R., Cross, C., Boyd, R., … Smith, J. (2018). The power of play: A pediatric role in enhancing development in young children. *Pediatrics, 142*(3). https://doi.org/10.1542/peds.20182058

Yu, Y., Zhao, Y., Li, D., Zhang, J., & Li, J. (2021). The relationship between big five personality and social well-being of Chinese residents: The mediating effect of social support. *Frontiers in Psychology, 11*. https://doi.org/10.3389/fpsyg.2020.613659

Zhang, D., Lee, E. K. P., Mak, E. C. W., Ho, C. Y., & Wong, S. Y. S. (2021). Mindfulness-based interventions: An overall review. *British Medical Bulletin*, *138*(1), 41-57. https://doi.org/10.1093/bmb/ldab005

Zhao, Y., Leach, L.S., Walsh, E., Batterham, P. J., Calear, A. L., Phillips, C., Olsen, A., Doan, T., LaBond & Banwell, C. (2022). COVID-19 and mental health in Australia – a scoping review. *BMC Public Health* 22, 1200. https://doi.org/10.1186/s12889-022-13527-9

Zylowska, L., Ackerman, D. L., Yang, M. H., Futrell, J. L., Horton, N. L., Hale, T. S., Pataki, C., & Smalley, S. L. (2008). Mindfulness meditation training in adults and adolescents with ADHD: A feasibility study. *Journal of Attention Disorders*, *11*(6), 737-746. https://doi.org/10.1177/1087054707308502