RESEARCH ARTICLE

Langerian Mindfulness Reduces Learned Helplessness: An Online Experiment on Undergraduates in Malaysia

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Abstract: Learned helplessness (LH) is related to adverse psychological and academic consequences such as absenteeism, depression, and academic procrastination. Although researchers have suggested the potential of Langerian mindfulness to reduce LH, the effectiveness of Langerian mindfulness remains open to date. An online experiment was completed to investigate the usefulness of Langerian mindfulness in reducing LH among 165 undergraduates in Malaysia. All participants were administered the unsolvable concept formation tasks to induce LH and the Learned Helplessness Scale for induction checking. Participants were then randomized into either the treatment group or the control group. The treatment group underwent a Langerian mindfulness practice, whereas the control group summarized a news article. Finally, all participants answered the Positive State Mindfulness Scale (PSMS) and 20 anagrams to measure the level of mindfulness and LH, respectively. Independent samples t-test results indicated that LH was induced successfully. Moreover, the treatment group scored significantly lower in the open-ended expectation dimension of the PSMS and scored significantly higher in anagrams (i.e., low LH) than the control group. The findings provided empirical support for the beneficial effect of Langerian mindfulness on decreasing LH and demonstrated the usability of Langerian mindfulness in the Malaysian context. Therefore, educators and practitioners are encouraged to employ Langerian mindfulness practice to help students alleviate their LH.

Keywords: Langerian mindfulness, learned helplessness, depression, undergraduates

Learned helplessness occurs when repeated exposure to uncontrollable and aversive stimuli causes individuals to give up on trying to change or escape from the aversive stimuli (Maier & Seligman, 1976). Learned helplessness causes people to overlook possible opportunities for relief or change, as repeated failures make them assume that they have no control over the present situation (Bukowski & Kofta, 2017). Although some interventions have been proposed, they are not without limitations. This study aims to expand the option of interventions by examining the hypothetical effect of Langarian mindfulness on reducing learned helplessness using an experimental approach.

Learned Helplessness

Learned helplessness was generally used to explain the onset and continuation of depression (Song &

Vilares, 2021). According to the reformulated learned helplessness model, learned helplessness is associated with a pessimistic attributional style (Abramson et al., 1978). This happens when individuals attribute their failures to stable, global, and internal causes as opposed to unstable, specific, and external causes. As such, people are more prone to feel that they do not have control over a negative situation, leading to a general disengagement and an increased risk for depression (Ledrich & Gana, 2012).

Aside from depression, studies have found various negative impacts of learned helplessness on individuals, such as anxiety (Gürefe & Bakalim, 2018), fatigue (Chung et al., 2017), decreased motivation to learn (Hartanto et al., 2021), and maladaptive perfectionism (Sankaran, 2018). Additionally, studies have revealed that learned helplessness is linked with academic procrastination (Prihadi et al., 2018), mathematic anxiety (Gürefe & Bakalim, 2018), psychoactive drug use and abuse (Adeoye et al., 2020) as well as absenteeism and course withdrawal (Lee & Carson, 2014) among students. Prihadi et al. (2018) explained that learned helplessness significantly predicted academic procrastination, with an internal locus of control fully mediating the relationship. This means that when students feel helpless, they will believe that they are not in control of their academic performance, thus leading them to procrastinate. In accordance with the research above, Lee and Johnston-Wilder (2017) also claimed that learned helplessness could hinder the development of students' mathematical resilience, which is the desire to improve fluency and the ability to obtain resources needed to solve obstacles related to mathematical development.

Intervention for Learned Helplessness

Several methods have been suggested to alleviate learned helplessness. Firstly, an experiment conducted by Klein and Seligman (1976) found that experiencing a controllable version of the event that caused learned helplessness can reduce its effects. After being induced with learned helplessness using an unsolvable experimental task, participants who experienced a set of solvable problems had a lower level of learned helplessness. This is because they perceive that their actions are related to an outcome. Although experiencing controllable events are effective against learned helplessness, this method is more complicated as one would have to prepare those controllable events or solvable solutions beforehand.

Next, Hooper and McHugh (2013) examined whether managing unwanted thoughts with cognitive defusion can reduce the negative effects of learned helplessness. Before manipulating learned helplessness, participants received 1 out of 3 instructions that instructed them to observe and label their thoughts (cognitive defusion group), to suppress their negative thoughts with positive ones (thought distraction group), or no instruction (control group). Next, all participants underwent an unsolvable concept formation task to induce learned helplessness. Finally, participants completed a maze task and measured their maze completion time. The study found that the cognitive defusion group's maze completion time was significantly shorter than the other groups, indicating that cognitive defusion can alleviate the adverse effects of learned helplessness. However, cognitive defusion instruction was given to participants before learned helplessness was induced. Therefore, Hooper and McHugh's (2013) study can only demonstrate the effect of cognitive defusion in preventing learned helplessness. In other words, the alleviating effects of cognitive defusion on the existing learned helplessness remain open. Meanwhile, Ulusoy and Duy (2013) found that a 10-week psychoeducation program based on cognitive-behavioral therapy is ineffective in decreasing learned helplessness.

The literature mentioned above suggests that the efficiency of the existing methods to alleviate learned helplessness is not satisfactory. Therefore, it is vital to identify a practical coping method against learned helplessness. Based on the literature review, Langerian mindfulness shows promise in mitigating the impact of learned helplessness (Pagnini et al., 2016).

Langerian Mindfulness

Langerian mindfulness is characterized by the dual concepts of mindfulness and mindlessness proposed by Langer (1992). Mindfulness refers to the simple process of being aware of novel distinctions in experiences or situations. As reality is constantly changing, paying attention to the changes in reality will compel individuals to become aware of the here and now (Davenport & Pagnini, 2016). One core component of Langerian mindfulness is the embrace of uncertainties. As we become comfortable with

not knowing, we are more open to new information, allowing us to be more engaged with the present moment.

Conversely, mindlessness is a state of mind in which an individual is overly dependent on the previously established category or experiences (Langer, 1992). Mindlessness is characterized by a minimal process of information, the inflexibility of cognitive states, and low attention to the current contexts (Langer et al., 1989). Unlike mindfulness, mindless individuals are stuck with a single and inflexible perspective about a situation (Langer, 1992; Pagnini et al., 2018). Moreover, Langer (2011) stated that mindless people would become undoubted to the present moment as they are confident that their knowledge about the present moment will hold true; this makes them process information automatically according to their fixed schema. When people lock themselves with the fixed schema, they will be blind to novel information (Fatemi & Langer, 2018) and become unaware of the present moment (Langer & Moldoveanu, 2000).

According to Langer (1989), learned helplessness stems from mindlessness because past experiences are mindlessly used to judge the present situation, thus limiting our present reactions and reducing our perception of control. Even when the situation has changed, individuals mindlessly take the correlations created in the past (negative experiences) into the present (Pagnini et al., 2016). On the other hand, mindful individuals do not rely on the narrow perspective created based on past experiences. Instead, they look for new aspects of the present situation and make flexible adaptations. Thus, by practicing Langerian mindfulness, mindful individuals become sensitive to the subtle changes in reality and can consider a problem or a situation from multiple perspectives (Langer & Moldoveanu, 2000).

Two recent studies have successfully demonstrated that online Langerian mindfulness intervention is beneficial to stroke survivors and their caregivers (Demers et al., 2022), as well as people with amyotrophic lateral sclerosis (Pagnini et al., 2021). Demers et al. (2022) reported that their participants, who were stroke survivors and their caregivers, had positive experiences, high levels of satisfaction, and good adherence to daily exercises. Similarly, Pagnini et al. (2021) found that online Langerian mindfulness intervention increased the quality of life of people with amyotrophic lateral sclerosis. The findings not only shed light on the positive effect of online Langerian mindfulness practices but also highlight the feasibility of delivering online Langerian mindfulness practices for people with limited mobility or who reside in rural areas.

The Present Study

Although Langerian mindfulness has been repeatedly suggested by researchers to mitigate learned helplessness, to the best of our knowledge, no experimental study has been done to validate this relationship to date. Thus, this study aims to provide empirical evidence to support the usefulness of Langerian mindfulness against learned helplessness. To do this, an online experiment with a between-subject design was conducted to examine if Langerian mindfulness practice (vs. a control task to summarize a news article) can relieve the learned helplessness induced by an unsolvable concept formation at the beginning of the experiment by comparing the performance of the treatment and control groups in an anagram task.

The present study is expected to fill the research gap in the Langerian mindfulness literature. In fact, the current study is the first to explore the relationship between learned helplessness and Langerian mindfulness or any other type of mindfulness. So, this study can bring valuable theoretical insights and statistical evidence to extend the work of Ellen Langer. Next, although Langerian mindfulness has been repeatedly associated with learned helplessness in past literature, the explanation of its mechanism provided is insufficient and vague. For example, the explanation given by Pagnini et al. (2016) is that learned helplessness is a form of mindlessness in which individuals mindlessly carry associations made in the past to the present moment.

Also, the practical significance is that this current study proposes a new, effective, and easier-to-practice method to reduce the effects of learned helplessness compared to the methods proposed by past studies. With this, the current research can positively impact the general population by providing them with a self-help technique to deal with real-life helpless events, such as coping with repeated failures. Moreover, practicing mindfulness as a self-help technique has become increasingly popular in recent years (Taylor et al., 2021). As such, this study can expand the benefits of practicing mindfulness, specifically by

noticing new details in our environment. Finally, to our knowledge, Langerian mindfulness has not received as much research attention as meditative mindfulness proposed by Kabat-Zinn et al., (1986). Experimental manipulation of Langerian mindfulness is still underrepresented in the current literature. Thus, this study can provide future researchers with an example of Langerian mindfulness manipulation in experiments.

Methodology

Participants

Convenience and snowball sampling methods were employed to recruit the participants from different higher education institutions across Malaysia. In total, 17 participants were removed based on the exclusion criteria of not being Malaysian ($n = 4$), failed attention-checking items ($n = 9$), and outliers ($n = 4$). The final sample consisted of 165 participants (120 females, 45 males) with ages ranging from 19 to 25 ($M = 21.19$, $SD = 1.179$). Most of the participants were Chinese (84.2%), followed by Indian (9.7%), Malay (5.5%), and Others (0.6%). Most of the participants were Buddhist (66.1%), followed by Christian (19.4%), Hindu (6.1%), Muslim (4.8%), and Others (3.6%). Exclusion criteria included (a) below 18 years old or over 25 years old, (b) not a full-time undergraduate, (c) not a Malaysian, (d) has done our pilot study before, (e) refusing to give consent to participate in the study, and (f) answer wrongly for one or more of the attention-checking items.

Instruments

Manipulation of Learned Helplessness

Learned helplessness was induced by using a digital version of the standard concept formation task (Hiroto & Seligman, 1975; Levine, 1971). In this task, participants were shown a series of two different stimulus patterns. Each pattern consisted of four dimensions, and each dimension consisted of two different values: (a) shapes (square or circle), (b) color (red or green), (c) letter ("A" or "T"), and (d) font size (large or small). Participants were instructed that one of the patterns was pre-determined by the researchers to be "correct" according to one of its values (e.g., red), and they would receive the "correct" feedback if they chose the pattern that contains that value. Hence, the participant's task was to select one of the two patterns that they think is correct. Then, based on the computer-generated feedback ("correct" or "incorrect"), they must find out the pre-determined "correct" value and get as many correct answers as possible. Each participant was given four sets of 10 trials, and each set contained a different value as being correct. Participants ' performance was displayed at the end of the 10th trial (e.g., "Your score for Question 1 is: 4/10"). However, the participants were unaware that the feedbacks they received were randomly generated, and there was no way to figure out the solution to this task. Therefore, the task was unsolvable as it was done to induce the feeling of learned helplessness.

Learned Helplessness Scale (LHS)

The Learned Helplessness Scale (LHS) developed by Quinless and Nelson (1988) was used to measure learned helplessness. A modification in the scale's instruction had been made in which participants were instructed to answer the scale based on their feelings towards the concept formation task. This scale consisted of 20 self-report items and scored on a four-point Likert scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). A higher score in LHS signifies a greater degree of learned helplessness.

Langerian Mindfulness Practice

Participants in the treatment group received a mindfulness intervention instruction similar to the instruction used in James (2018) that guided them through the process of noticing new details. The instructions included noticing three new details about their body, an object, and the environment. Afterward, the participants were instructed to take deep breaths, close their eyes and recall the nine new details that they noticed for two minutes.

BBC Newspaper Article

An article titled "*Diesel vehicles are important for the UK economy, says industry*" was used as a control condition for Langerian mindfulness treatment ("Diesel vehicles important," 2017). This is replicated from a mindfulness study done by Mantzios et al. (2019). Participants were instructed to read through the news article as many times as they liked before writing a summary of the article in two minutes. This task aimed to let participants go through a bogus task with a similar duration that would not produce

any emotional reactions that could influence their performance in this study.

Positive State Mindfulness Scale (PSMS)

The Positive State Mindfulness Scale (PSMS; Ritchie & Bryant, 2012) is a nine-item questionnaire that was used to measure participants' state of Langerian mindfulness. The scale consisted of three subscales, which are focused attention (FA), novelty appreciation (NA), and open-ended expectations (OEE), and each subscale contains three items. The PSMS is rated on a six-point Likert scale from 1 (*strongly disagree*) to 6 (*strongly agree*). The scale is scored by totaling up the score of each subscale separately, and higher scores in each subscale indicate higher levels of the related dimension. The current study chose the PSMS to measure state Langerian mindfulness, although the three subscales of PSMS do not measure the same four primary components suggested in the Langerian mindfulness scale (novelty seeking, novelty producing, engagement, & flexibility; Pirson et al., 2012). This is because PSMS was the only scale in the current literature that measures state Langerian mindfulness to our knowledge. Firstly, PSMS is different from the Langerian mindfulness scale as novelty appreciation refers to enjoying and appreciating new things, whereas novelty seeking refers to being curious and seeking new details in the surroundings, and novelty producing refers to creating new categories of thinking and innovation. Next, open-ended expectation, which is being open to uncertainties, is also different from flexibility, which is being able to consider things from multiple perspectives. However, focused attention did share some similarities to engagement, as both constructs describe an active focus of attention on the present moment.

Solvable Anagram-Solution Task

The impact of learned helplessness induced in the concept formation task was measured using an anagram task derived from past learned helplessness experiments (McLaughlin et al., 2010; Hommel et al., 2006). Twenty solvable anagrams were shown to the participants, and participants were instructed to unscramble the letters and type their answers in the space provided in the Qualtrics. Each anagram consisted of five scrambled letters, and they were scrambled in the same order such that all solutions followed the same order of 5-3-1-2-4. Participants were informed that they were allowed to try as many times as they wanted within a 100-second time limit, and all the anagrams could be solved with a pattern. The number of anagrams that participants accurately solved was measured and used as the dependent variable.

Research Procedures

An online experiment was conducted due to the COVID-19 pandemic. The between-subjects design was used. Participants were told to play a series of games in the study to assess the effects of emotional well-being on logical reasoning and linguistic ability. A debriefing section was conducted to explain the objectives of the current study to participants at the end of the experiment. Before conducting the main study, a pilot study was first conducted to ensure the effectiveness of manipulation, determine the sample size, ensure the feasibility of the study, and enhance the research design.

The recruitment message was disseminated through social media platforms such as WeChat, Facebook, WhatsApp, Instagram, and Microsoft Teams. First, participants registered themselves in the Google form. Next, a pre-experiment briefing was done via video conferencing software (e.g., Skype or Microsoft Teams) to ensure all participants understood the experiment's rules. Afterward, a link to the main study was given to the participants to start the experiment. Participants were asked to remain in the video conferencing software until they completed the experiment. This allows the participants to have maximum involvement and minimum external interference throughout the experiment.

Figure 1 shows the procedure of the experiment. After filling up the consent form, all participants were administered the (unsolvable) concept formation tasks to induce learned helplessness in the present moment. In the unsolvable concept formation task, participants were shown a series of two different stimulus patterns and instructed to choose the pattern that contained the "correct" value pre-determined by the researchers. For example, the pre-determined "correct" value is the letter A. The participants will receive "correct" feedback if they choose the pattern that contains that value. However, there was no "correct" value, and the task was unsolvable. Note that a control group for learned helplessness was omitted because past studies have shown good reliability in inducing learned helplessness by using unsolvable concept formation

tasks (Chaney et al., 1999; Hommel et al., 2006; McLaughlin et al., 2010). Specifically, the three past studies showed that the participants who underwent the unsolvable concept formation task scored lower on a subsequent (anagram task) than participants who received the solvable concept formation task as the unsolvable concept formation task aims to increase participants' level of learned helplessness.

After completing the unsolvable concept formation task, the participants were instructed to answer the LHS. Subsequently, they were randomized into either the Treatment group (practicing Langerian mindfulness) or the Control group (reading a BBC newspaper article). In both groups, the time limit was pre-determined as 2 minutes by using the Qualtrics software, and they were unable to skip to the next section within these 2 minutes. Then, the participants filled out the PSMS to measure their perceived mindfulness level.

Next, the anagram task was used to measure participants' level of perceived learned helplessness. They can submit their answer by clicking on the "submit" button at any time, whereas the participants who wish to give up may also leave the answer blank and click the "submit" button at any time. Furthermore, the participants filled out the demographic information and were debriefed on the real purpose of the study.

Results

Manipulation Checking

Learned Helplessness

We induced learned helplessness among the participants with the unsolvable concept formation task. The effectiveness of induction was examined

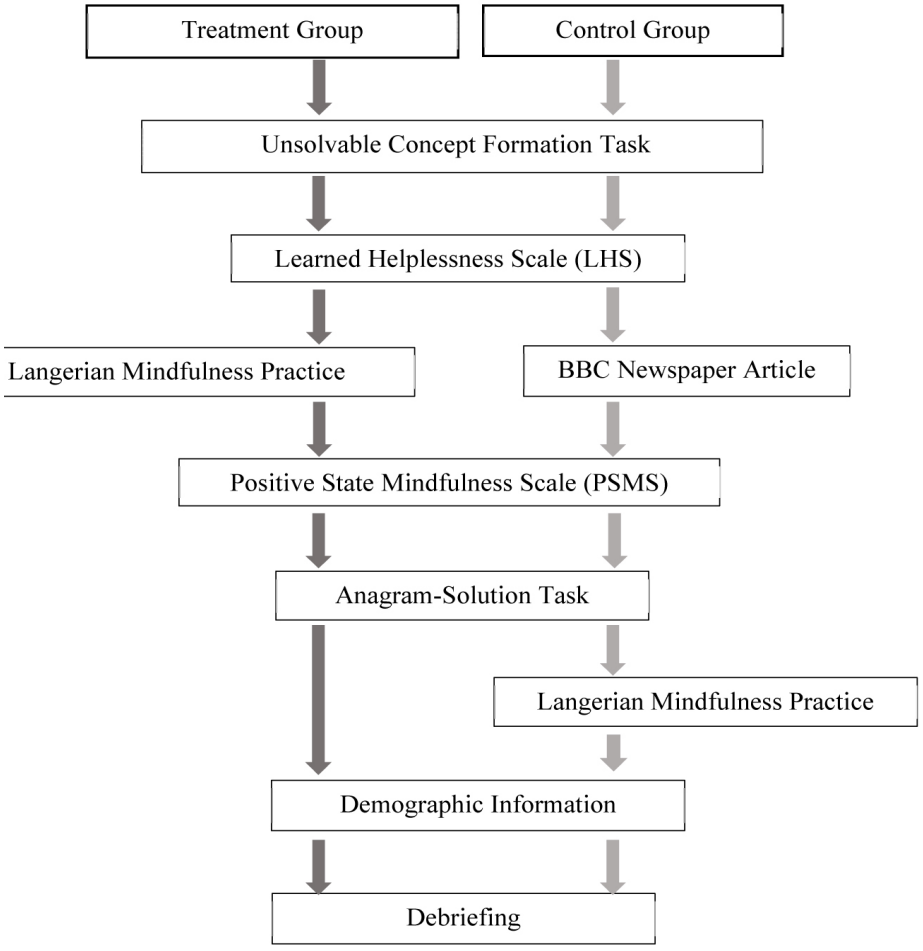

Figure 1. The Flow of Research Procedures

using an independent samples t-test. The LHS scores of the treatment (M = 49.76, SD = 5.870) and control (M = 48.55, SD = 5.259) groups were not significantly different; $t(163)$ =.615, p =.546. The result indicated that the two groups had a similar level of learned helplessness after completing the unsolvable concept formation task.

Langerian Mindfulness

An independent samples t-test was used to analyze the three subscales of the PSMS. Statistically, the treatment and control groups showed no difference in the Focused Attention subscale score, $t(163)$ = 1.666, p = .098, and Novelty Appreciation subscale scores, $t(163)$ = .60, t = .952. Conversely, a significant difference was found in the Open-Ended Expectation subscale score, $t(163)$ = 2.916, p = .004, Cohen's d = 0.46. The treatment group had a lower OEE score than the control group (See Table 1). The results, as measured by the PSMS, indicated that the effectiveness of Langerian mindfulness practice was unclear.

Anagram Performance

Next, the result of the Anagram-solution task, which aimed to measure the effect of Langerian mindfulness on learned helplessness, was analyzed using a one-tailed independent samples t-test. As shown in Table 1, the treatment group scored significantly higher than the control group in Anagram scores, $t(163)$ = 1.781, p = .039, d = 0.28. The findings show that participants in the treatment group who practiced Langerian mindfulness had less learned helplessness than their counterparts in the control group.

Discussion

The focus of the current study is to examine the effectiveness of the Langerian mindfulness practice as a treatment for reducing learned helplessness among undergraduates in Malaysia. Our results support that Langerian mindfulness is useful for reducing learned helplessness.

To induce learned helplessness, we administered the unsolvable concept formation task to both groups to ensure that the participants were in the same helpless condition before receiving the Langerian mindfulness practice or reading a BBC news. Statistically, the two groups did not show a significant difference in the learned helplessness scale. In other words, the findings show that both groups of participants have had the same level of learned helplessness. However, it is acknowledged that the effectiveness of learned helplessness manipulation was not clearly demonstrated in the current study. As a suggestion,

Table 1

Summary of Descriptive Statistics for All Variables

	Control Group (n = 82)		Treatment Group (n = 83)		
	M	***SD***	***M***	***SD***	Cohen's ***d***
LHS	48.55	5.26	49.76	5.87	0.22
FA	12.57	3.11	13.30	2.47	0.26
NA	12.54	3.33	12.57	3.05	0.01
OEE	14.43[a]	2.55	13.30[b]	2.41	0.46
Anagram	13.50[b]	5.33	14.82[a]	4.10	0.28

Note: *SD* = Standard Deviation, *M* = Mean, *SE* = Standard Error, LHS = Learned Helplessness Scale, FA = Focused Attention, NA = Novelty Appreciation, OEE = Open-Ended Expectation

[a]Significant difference was found between the groups using two-tailed independent T-test.

[b]Significant difference was found between the groups using one-tailed independent T-test.

future researchers can incorporate a control group with a solvable concept formation task in the study and compare their learned helplessness scores to those who completed the unsolvable concept formation task. Such a comparison will provide a clearer picture of the effectiveness of learned helplessness manipulation.

The results of the Langerian mindfulness manipulation revealed that there was no significant difference between the FA and NA dimensions of PSMS. At the same time, the control group's OEE was significantly greater than the treatment group's. Here, several possible explanations for the unexpected results are offered.

Although the treatment group scored higher on the FA dimension of the PSMS than the control group, the difference was not statistically significant. The effect size for FA was small ($d = 0.26$), which could be due to the small sample size being unable to detect the difference between the two groups. When calculated using the effect size of $d = 0.26$, two-tailed, statistical power level of 0.95, and the error probability level of 0.05, the required sample size is 105 participants per group, which exceeded the current sample size by 45 participants.

Similarly, the NA dimension of both groups had no significant difference. This means that the Langerian mindfulness practice does not make participants in the treatment group appreciate a sense of novelty more than the control group. According to Langer (2014), being mindful implies being receptive to new information. Thus, the intervention of this study was designed to let participants become aware of new details in themselves, an object, and their surroundings. However, the NA dimension was designed to measure a sense of appreciation towards novelty instead of being open to novel details. In fact, "openness to novelty" and "novelty appreciation" were included in the item construction phase of the PSMS as two separate dimensions, yet the "openness to novelty" dimension was not included in the finalized model. So, the possible explanation for this result is that the PSMS was designed to measure NA, but our study's instruction focused on being aware of the novel experience and did not include the element of appreciation. In other words, it is possible that although the participants experienced novelty, they did not have a sense of appreciation for it.

Also, for the open-ended expectation (OEE) dimension of PSMS, the current study found that the control group scored higher than the treatment group. The possible explanation for this result could be the last part of the Langerian mindfulness instruction in which the participants were asked to recall the nine newly noticed things while doing a two-minute breathing exercise. The purpose was to make the participants learn that they can notice new things, ultimately reducing the effect of learned helplessness. However, when participants focused on their breathing and the nine new differences, they may not pay attention to their surroundings. As a result, the participants were less open to new environmental changes (i.e., low open-ended expectations) when they wholly emerged in the breathing exercise.

Finally, as the study found a lack of effectiveness in the Langerian mindfulness practice as measured by the PSMS, two possible reasons can explain why this study's treatment group scored higher than the control group in the Anagram task. Firstly, it could be the case that Langerian mindfulness was effective, but the scale chosen was not suitable to measure the state of Langerian mindfulness. However, the PSMS is the most suitable tool to fulfill the need of the present study to measure state Langerian mindfulness. Therefore, the other measurement, such as the 21-item Langerian Mindfulness Scale (LMS; Pirson et al., 2012) that measures trait Langerian mindfulness of an individual (e.g., novelty seeking, novelty producing, engagement, and flexibility), was not employed. Furthermore, the Current Experiences Inventory (CEI) is a tool for assessing state Langerian mindfulness, and it assesses four factors, namely "novelty seeking, novelty producing, engagement, and flexibility," all of which are aligned with the Langerian mindfulness construct (Krech, 2006). However, CEI focuses more on the overall state of Langerian mindfulness in a day instead of accessing the state of Langerian mindfulness based on a specific task. Therefore, PSMS has been chosen to measure state Langerian mindfulness in a specific task. It was developed based on the prototype of LMS, and it intends to measure the state Langerian mindfulness during a positive experience. Although the subscales of PSMS did not perfectly measure the four primary components of Langerian mindfulness, it is the most suitable scale for this study in measuring state Langerian mindfulness based on those available instruments. Thus, it is possible that the insignificant result was due to a misalignment between the scale chosen and the current study's variable.

The second potential explanation is that the two groups of this study may have different expectations for improvement based on the interventions they received. As described by Boot et al. (2013), participants in psychological intervention studies typically are aware of their treatment. Thus, participants in the control group may not expect the same level of improvement on a given task as those in the treatment group. In other words, as participants in the treatment group know that they are undergoing an intervention, they might expect to do better on a subsequent task than the control group. Consequently, this expectation will lead to a placebo effect in which the performance improvement is due to the expectation of improvement rather than the effect of the Langerian mindfulness intervention. This theory is justified by the OEE result, which showed that the treatment group had higher expectations after participating in the Langerian mindfulness practice. Here, Boot et al. (2013) offered two solutions to the issue: to include an active control group that serves to induce the same expectation for improvement as the treatment group and test for differential expectations. However, as this study does not look into whether the two groups share similar expectations before moving on to the Anagram task, the causal conclusion about the effectiveness of Langerian mindfulness practice on learned helplessness remains unclear. To control the differences in expectations between groups, future intervention studies may follow the recommendations of Boot et al. (2013).

Under the assumption that the Langerian mindfulness practice was effective, the current study successfully demonstrated the effectiveness of Langerian mindfulness in reducing learned helplessness by comparing the performance of both groups on an anagram task. The treatment group outperformed the control group on the anagram task, showing that the participants in the treatment group were able to "escape" from the induced learned helplessness, also known as mindlessness. In other words, they did not situate in the previous failure and were able to perceive the anagram task as a new situation. The findings are consistent with Maier and Seligman's (1976) original learned helplessness model, which revealed that individuals who have previously experienced uncontrollability developed an expectation of response-outcome independence. Therefore, individuals tend to underestimate the relationship between their responses and the outcomes in later tasks, even if they have control over it (Maier & Seligman, 1976). Furthermore, Pagnini et al. (2016) pointed out that learned helplessness is a particularly intense form of mindlessness. Even though the circumstance has changed, the prior associations (failure to solve the concept formation task) are carried over into the present (the anagram task). This explanation describes the underlying mechanism for the control group's poor performance on the anagram task.

On the other hand, the participants who had undergone Langerian mindfulness practice did not bring their failure in the prior concept formation task to the anagram task (present). This is supported by Baltzell and McCarthy (2016), which stated that a mindful person could adapt to the present moment flexibly without relying on previous experiences that the situation is inescapable. When an individual is in a mindful state, learned helplessness does not occur (Langer, 1989; Pagnini et al., 2016). Overall, the results indicate that Langerian mindfulness was able to reduce the maladaptive habits, heuristics, and automatic thoughts caused by their past failures. This study provided preliminary evidence to use Langerian mindfulness as a self-help technique to overcome learned helplessness. Moreover, as learned helplessness is often associated with depression (Song & Vilares, 2021), anxiety (Gürefe & Bakalim, 2018), as well as internalizing and externalizing issues (Sorrenti et al., 2019), this study also highlights the potential to incorporate the technique used in this study (i.e., noticing new details in our environment) into mindfulness programs developed for the clinical population in the future.

Limitations

The present study is prone to undercoverage bias. The sample consisted of an unequal number of participants in terms of gender and ethnicity. Although we tried to minimize the imbalance by recruiting individuals online, the recruitment of participants during the COVID-19 pandemic was still challenging.

Furthermore, as previously indicated, the effects of novelty and differential expectancies on the relationship between Langerian mindfulness and learned helplessness were not examined in this study. To avoid overgeneralization, care must be taken when interpreting the findings of the current study.

Lastly, the performance of the anagram task is partly dependent on the participants' English proficiency.

For example, one of the anagrams is UNATJ, and the answer is JAUNT by following the sequence of 5-3-1-2-4. Therefore, if some of the participants were not familiar with the word JAUNT, they would not be able to answer the anagram.

Recommendations for Future Study

Future researchers can implement a stratified sampling method to avoid undercoverage bias. The stratified sampling obtains the sample by dividing the population into strata (sub-groups) according to various homogeneous features such as age, gender, and ethnicity. The study could avoid underrepresenting some subgroups and reach an average number of participants in different sub-groups.

In addition, future studies may consider removing the breathing exercise component at the end of the intervention to clarify the impact of the exercise on open-ended expectations.

In terms of study design, it is recommended for future studies that utilize the concept formation task to implement a control group that receives the solvable version of the task. Thus, the effectiveness of learned helplessness manipulation could be firmly reassured. Aside from that, future research may include a control group that induces the same expectation for improvement as the treatment group or test for differential expectations to validate further or examine the difference in expectations between treatment and control groups. Finally, future studies may modify the anagrams to reduce the influence of linguistic ability on the anagram task.

Declarations

Author's contributions

Conceptualization, W.P.W.; methodology, W.P.W., C.T.A., X.Y.Y., and C.-S.T.; formal analysis, W.P.W.; investigation, W.P.W., C.T.A., X.Y.Y., and C.-S.T; data curation, W.P.W., C.T.A., X.Y.Y., and C.-S.T.; writing—original draft preparation, W.P.W., C.T.A., and X.Y.Y.; writing—review and editing, C.-S.T.; project administration, W.P.W., C.T.A. and X.Y.Y.; All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national). Ethics approval was granted by the Scientific and Ethical Review Committee (Ref: U/SERC/189/2020).'

Informed Consent Statement

Informed consent was obtained from all individual participants included in the study.

Data Availability Statement

Due to the nature of this research, participants of this study did not agree for their data to be shared publicly, so supporting data is not available.

Conflicts of Interest

The authors have no conflicts of interest to declare that are relevant to the content of this article.

References

Abramson, L. Y., Seligman, M. E., & Teasdale, J. D. (1978). Learned helplessness in humans: Critique and reformulation. *Journal of Abnormal Psychology, 87*(1), 49–74. https://doi.org/10.1037/0021-843X.87.1.49

Adeoye, O. E., Fasanmi, S. S., & Igo, J. (2020). Self-concept clarity, learned helplessness and fatigue severity as predictors of psychoactive drug use and abuse among undergraduates. *International Journal of Sciences: Basic and Applied Research (IJSBAR), 53*(2), 198–210. http://gssrr.org/index.php?journal=JournalOfBasicAndApplied

Baltzell, A. L., & McCarthy, J. M. (2016). Langerian mindfulness and optimal sport performance. In S. Fatemi (Ed.), *Critical mindfulness* (pp. 159–171). Springer. https://doi.org/10.1007/978-3-319-30782-4_10

Boot, W. R., Simons, D. J., Stothart, C., & Stutts, C. (2013). The pervasive problem with placebos in psychology: Why active control groups are not sufficient to rule out placebo effects. *Perspectives on Psychological Science*, *8*(4), 445–454. https://doi.org/10.1177/1745691613491271

Bukowski, M., & Kofta, M. (2017). From coping to helplessness: Effects of control deprivation on cognitive and affective processes. In M. Bukowski, I. Fritsche, A. Guinote, & M. Kofta (Eds.), *Coping with lack of control in a social world* (pp. 15–34). Routledge/Taylor & Francis Group.

Chaney, J. M., Mullins, L. L., Uretsky, D. L., Pace, T. M., Werden, D., & Hartman, V. L. (1999). An experimental examination of learned helplessness in older adolescents and young adults with long-standing asthma. *Journal of Pediatric Psychology, 24*, 259–270. https://doi.org/10.1093/jpepsy/24.3.259

Chung, G. H., Choi, J. N., & Du, J. (2017). Tired of innovations? Learned helplessness and fatigue in the context of continuous streams of innovation implementation. *Journal of Organizational Behavior, 38*(7), 1130–1148. https://doi.org/10.1002/job.2191

Davenport, C., & Pagnini, F. (2016). Mindful learning: A case study of Langerian mindfulness in schools. *Frontiers in Psychology, 7*. https://doi.org/10.3389/fpsyg.2016.01372

Demers, M., Pagnini, F., Phillips, D., Chang, B., Winstein, C., & Langer, E. (2022). Feasibility of an online Langerian mindfulness program for stroke survivors and caregivers. *OTJR: Occupation, Participation and Health, 42*(3), 228–237. https://doi.org/10.1177/15394492221091266

Diesel vehicles important for UK economy, says industry. (2017, April 24). *BBC News*. http://www.bbc.co. uk/news/business-39700991

Fatemi S. M., & Langer E. J. (2018) Langerian mindfulness and its psychotherapeutic implications: Recomposing/decomposing mindlessly constructed life stories. In: B. Kirkcaldy (Ed.), *Psychotherapy, literature and the visual and performing arts* (pp. 43–52). Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-319-75423-9_3

Gürefe, N., & Bakalim, O. (2018). Mathematics anxiety, perceived mathematics self-efficacy and learned helplessness in mathematics in faculty of education students. *International Online Journal of Educational Sciences, 10*(3), 154–166. https://doi.org/10.15345/iojes.2018.03.011

Hartanto, G., Livesey, E., Griffiths, O., Lachnit, H., & Thorwart, A. (2021). Outcome unpredictability affects outcome-specific motivation to learn. *Psychonomic Bulletin & Review*. Advance online publication. https://doi.org/10.3758/s13423-021-01932-x

Hiroto, D. S., & Seligman, M. E. (1975). Generality of learned helplessness in man. *Journal of Personality and Social Psychology, 31*(2), 311–327. https://doi.org/10.1037/h0076270

Hommel, K. A., Chaney, J. M., Wagner, J. L., & Jarvis, J. N. (2006). Learned helplessness in children and adolescents with juvenile rheumatic disease. *Journal of Psychosomatic Research, 60*(1), 73–81. https://doi.org/10.1016/j.jpsychores.2005.07.001

Hooper, N., & McHugh, L. (2013). Cognitive defusion versus thought distraction in the mitigation of learned helplessness. *The Psychological Record, 63*(1), 209–218. https://doi.org/10.11133/j.tpr.2013.63.1.016

James, C. D. (2018). *Implementing Langerian mindfulness to increase flow experience during tennis performance* [Master's thesis, Harvard Extension School]. https://nrs.harvard.edu/URN-3:HUL.INSTREPOS:37365364

Klein, D. C., & Seligman, M. E. (1976). Reversal of performance deficits and perceptual deficits in learned helplessness and depression. *Journal of Abnormal Psychology, 85*(1), 11–26. https://doi.org/10.1037/0021-843X.85.1.11

Kabat-Zinn, J., Lipworth, L., Burncy, R., & Sellers, W. (1986). Four-year follow-up of a meditation-based program for the self-regulation of chronic pain: treatment outcomes and compliance. *The Clinical Journal of Pain*, *2*(3), 159-774. https://doi.org/10.1097/00002508-198602030-00004

Krech, P. R. (2006). *Development of a state mindfulness scale* [Unpublished doctoral dissertation]. Arizona State University.

Langer, E. J. (1989). Minding matters: The consequences of mindlessness–mindfulness. *Advances in Experimental Social Psychology, 22*, 137–173. https://doi.org/10.1016/s0065-2601(08)60307-x

Langer, E. J. (1992). Matters of mind: Mindfulness/mindlessness in perspective. *Conscious and Cognition, 1*(3), 289–305. https://doi.org/10.1016/1053-8100(92)90066-J

Langer, E. J. (2011). A mindful alternative to the mind/body problem. *Journal of Cosmology*, 14. https://thejournalofcosmology.com/Consciousness111.html

Langer, E. J. (2014). The nature of mindfulness. In *Mindfulness* (2nd ed., Ch. 5). Da Capo Press.

Langer, E. J., & Moldoveanu, M. (2000). The construct of mindfulness. *Journal of Social Issues, 56*(1), 1–9. https://doi.org/10.1111/0022-4537.00148

Ledrich, J., & Gana, K. (2012). Relationship between attributional style, perceived control, self-esteem, and depressive mood in a nonclinical sample: A structural equation-modelling approach. *Psychology and Psychotherapy: Theory, Research and Practice, 86*(4), 413–430. https://doi.org/10.1111/j.2044-8341.2012.02067.x

Lee, C., & Johnston-Wilder, S. (2017). The construct of mathematical resilience. In U. X. Eligio. (Ed.), *Understanding emotions in mathematical thinking and learning* (pp. 269–291). Academic Press. https://doi.org/10.1016/B978-0-12-802218-4.00010-8

Lee, L. L., & Carson, A. (2014). Intimate violence in a specialist college setting: Can students with learning difficulties manage themselves? *British Journal of Learning Disability, 42*(1), 6–16. https://doi.org/10.1111/bld.12004

Levine, M. (1971). Hypothesis theory and nonlearning despite ideal S-R-reinforcement contingencies.

Psychological Review, 78(2), 130–140. https://doi.org/10.1037/h0030647

Maier, S. F., & Seligman, M. E. (1976). Learned helplessness: Theory and evidence. *Journal of Experimental Psychology: General, 105*(1), 3–46. https://doi.org/10.1037/0096-3445.105.1.3

Mantzios, M., Egan, H., & Asif, T. A. (2019). Randomized experiment evaluating the mindful raisin practice as a method of reducing chocolate consumption during and after a mindless activity. *Journal of Cognitive Enhancement, 4*, 250–257. https://doi.org/10.1007/s41465-019-00159-y

McLaughlin, E., Lefaivre, M. J., & Cummings, E. (2010). Experimentally-induced learned helplessness in adolescents with type 1 diabetes. *Journal of Pediatric Psychology, 35*(4), 405–414. https://doi.org/10.1093/jpepsy/jsp061

Pagnini, F., Bercovitz, K. E., & Phillips, D. (2018). Langerian mindfulness, quality of life and psychological symptoms in a sample of Italian students. *Health and Quality of Life Outcomes, 16,* Article No. 29. https://doi.org/10.1186/s12955-018-0856-4

Pagnini, F., Bercovitz, K., & Langer, E. (2016). Perceived control and mindfulness: Implications for clinical practice. *Journal of Psychotherapy Integration, 26*(2), 91–102. https://doi.org/10.1037/int0000035

Pagnini, F., Phillips, D., Haulman, A., Bankert, M., Simmons, Z., & Langer, E. (2021). An online non-meditative mindfulness intervention for people with ALS and their caregivers: A randomized controlled trial. *Amyotrophic Lateral Sclerosis and Frontotemporal Degeneration*, *23*(1-2), 116-127. https://doi.org/10.1080/21678421.2021.1928707

Pirson, M., Langer, E. J., Bodner, T., & Zilcha, S. (2012). The development and validation of the Langer mindfulness scale - Enabling a socio-cognitive perspective of mindfulness in organizational contexts. *SSRN Electronic Journal*. http://doi.org/10.2139/ssrn.2158921

Prihadi, K., Tan, C. Y., Tan, R. T., Ling Yong, P., Yong, J. H., Tinagaran, S., & Yeow, J. L. (2018). Procastination and learned-helplessness among university students: The medication effect of internal locus of control. *Electronic Journal of Research in Education Psychology, 16*(3), 579–595. https://doi.org/10.25115/ejrep.v16i46.2236

Quinless, F. W., & Nelson, M. A. M. (1988). Development of a measure of learned helplessness. *Nursing Research, 37*(1), 11–15. https://doi.org/10.1097/00006199-198801000-00003

Ritchie, T. D., & Bryant, F. B. (2012). Positive state mindfulness: A multidimensional model of mindfulness in relation to positive experience. *International Journal of Wellbeing, 2*(3), 150–181. https://doi.org/10.5502/ijw.v2.i3.1

Sankaran, S. (2018). Learned helplessness in sports: The role of repetitive failure experience, performance anxiety and perfectionism. *Polish Psychological Bulletin, 49*(3), 311–321. https://doi.org/10.24425/119498

Song, X., & Vilares, I. (2021). Assessing the relationship between the human learned helplessness depression model and anhedonia. *PLOS ONE, 16*(3), Article No. e0249056. https://doi.org/10.1371/journal.pone.0249056

Sorrenti, L., Spadaro, L., Mafodda, A. V., Scopelliti, G., Orecchio, S., & Filippello, P. (2019). The predicting role of school Learned helplessness in internalizing and externalizing problems. An exploratory study in students with specific learning disorder. *Mediterranean Journal of Clinical Psychology*, *7*(2). https://doi.org/10.6092/2282-1619/2019.7.2035

Taylor, H., Strauss, C., & Cavanagh, K. (2021). Can a little bit of mindfulness do you good? A systematic review and meta-analyses of unguided mindfulness-based self-help interventions. *Clinical Psychology Review*, *89*(102078), 1–12. https://doi.org/10.1016/j.cpr.2021.102078

Ulusoy, Y., & Duy, B. (2013). Effectiveness of a psychoeducation program on learned helplessness and irrational beliefs. *Educational Sciences: Theory & Practice, 13*(3), 1440–1446. https://doi.org/10.12738/estp.2013.3.1469