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The Effect of Learned Helplessness on Locus of Control and Anxiety

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Hiroto (1974) was one of the first researchers to depict learned helplessness in humans using a tone. His study was the basis for this experiment. It was hypothesized that the participants' anxieties would differ depending on their orientation of locus of control, when put in a learned helplessness situation. Thirty-two subjects were equally divided into either the learned helplessness condition or the control condition. Learned helplessness was generated by presenting variable intervals of an irritating tone that the subjects had no control over. The control group was able to control the duration of the tone. Analyses were computed using a 2x2 between-subjects ANOVA design. However, no main effects or interaction effects were found.

Seligman & Maier (1967) conducted a study with dogs, subjecting them either to escapable shock or inescapable shock. To escape the shock, the dogs were required to create a response, by pressing a button. In the inescapable condition, dogs could not escape the shock, as their responses were independent of shock delivery. After a few trials, the dogs underwent escape-avoidance training in a Columbia shuttle box. The dogs could avoid shock, if they jumped over the barrier in the box before shock began. However, Seligman & Maier discovered that the inescapable-dogs did not attempt to escape the shock; they simply gave up and began to accept the shocks. Seligman coined the term learned helplessness, which can be defined as "interference with escape responding," (Seligman & Maier, 1967, 1). At first, the dogs presented normal reactivity to shock, frantically trying to escape it. Nonetheless, as trials passed, they soon realized that their responses were independent of shock, even when given the chance to escape it in the shuttle box. Seligman explains that this behaviour cannot be due to an increased
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tolerance of the shock, since the same results occurred when gradually increasing the shock intensity.

Seligman suggests that the interference with escape and avoidance behaviours could be a result of lack of control (Seligman & Maier, 1967). Since Seligman has concluded that control is a big factor of learned helplessness, researchers have attempted to determine if there is a relationship between learned helplessness and locus of control. Locus of control (LofC) refers to the amount of perceived control a person believes they have over their environment. It also relates to how much of reinforcement is dependent upon the individual’s actions. There are two dimensions of locus of control – internal and external. An individual with internal LofC tends to view reinforcement as dependent on their actions. They attribute the consequences they face to their own skills and abilities. An individual with external LofC tends to view reinforcement as independent of their actions and attributes their consequences to luck, chance, or other individuals (Hiroto, 1974).

Hiroto (1974) predicted that control of reinforcement is the main factor relating to learned helplessness and locus of control. He conducted a study to examine internal and external LofC and learned helplessness in humans, rather than animals (which is the most common subject for learned helplessness studies thus far). The apparatus he used was analogous to the Columbia shuttle box, but much larger for humans. A 3000-Hz tone was presented to the subjects and they were given a button to escape the tone. Depending on the learning condition, the button either controlled or did not control the offset of the tone. Hiroto was successful at creating a learned helplessness paradigm for humans. He concluded that, “control over the reinforcement [is] a crucial variable,” for learned
helplessness (1974, p. 192). He also discovered that externals seemed more helpless in the learned helplessness condition than internals.

This present study is examining LofC, learned helplessness and one added variable – state anxiety. State anxiety is “an emotional reaction to a specific self-threatening situation,” (Carroll and Iles, 2006). State anxiety will be measured using Spielberger, Gorsuch, and Lushene’s (1970) State Anxiety Scale of the State-Trait Anxiety Inventory (STAI). LofC will be measured using Rotter’s (1966) Locus of Control Scale. It is predicted that individuals who are internal LofC will depict higher state anxiety when put in a learned helplessness situation than those who are external LofC. Since internal LofC individuals feel they have control over their environment, they should get more anxious when they feel they do not have control. On the other hand, since external LofC individuals already feel they do not have control over their environment, they should not experience as much state anxiety in the learned helplessness condition as internals do.

Method

Participants

Six individuals were involved in the pilot study. They were between the ages of 20 and 22 and were enrolled in the University of Western Ontario or its affiliated colleges.

Thirty-two individuals participated in this study. They were all enrolled in the University of Western Ontario or its affiliated colleges (specifically, Huron University College and Brescia University College) in London, Ontario. Participants were between the ages 18 and 22 and were Caucasian. There were 22 females and 10 males.
Participants were assigned to either internal or external LofC using a median-split design. This was based on their scores on Rotter’s Locus of Control Scale. Participants were equally divided and randomly assigned to either the learned helplessness condition or the non-learned helplessness condition.

**Materials**

A questionnaire booklet was assembled for each participant. A letter of information, a consent form, the Locus of Control Scale, a word search (which can be found in Appendix A, Figure 2), the State Anxiety Scale, and a debriefing form was distributed, in that order.

Rotter’s (1966) Locus of Control Scale was developed to measure externality. A forced-choice format is used, which provides two situations that the subject must choose between, based on which one they most agree with. Rotter found a relatively high internal consistency, moderate test-retest reliability, and satisfactory criterion validity for this scale. For Spielberger et al.’s (1970) State Anxiety Scale of the STAI, a four-point scale is used. The researchers reported a high internal consistency (ranging from $r=.83$ to $.92$) and a low test-retest reliability ($r=.16$, $p < 0.05$), which should be the case since it is measuring state anxiety. The word search was a meaningless task done by the subjects, just to provide a situation to subject the learned helplessness (LH) and non-learned helplessness (NLH) groups to the tone. The word search was created by using a website application that created the word search automatically given details regarding word choice and difficulty level (Theteacherscorner.net, 2008).

A laptop computer was used to generate the tone. Three different remotes were used to control the intervals of the tone presentation on the computer. One remote was for
the researcher to control the tone duration in the NLH group; the second remote was
given to the NLH group to control the tone duration; and the last remote was given to the
LH group, but it did not control the computer. The tone had a sample rate of 44.1 kHz.
The sound was played at 100% volume from the computer. The computer was also used
to record the tone-on/tone-off intervals of the NLH group using a program called *Audio
Hijack Pro*. The laptop monitor was not on during experimentation.

**Procedure**

A very small pilot study was done to determine if the tone was irritating enough.
Six individuals were asked to listen to the tone, and simply state if they thought it was
irritating. All subjects had answered, “Yes”; therefore, this tone was used for the paradigm.

Participants were handed the experiment booklet. As well, one of two remotes
was placed beside the participant, depending on which condition they were placed in (the
LH or the NLH). They were not told what the remote was for. All participants were
instructed to read the letter of information and sign the consent form in order to
participate. Once signed, the participants filled out the Locus of Control scale.
Participants were asked to inform the researcher when they completed the questionnaire,
so the researcher could prepare the tone.

Two different procedures were put forth at this point depending on the condition
the participant was assigned to. For the NLH group, subjects were given the remote that
worked to control the computer. Once the subjects began working on the word search, the
tone began playing. If the subjects had not complained about the tone within one minute
of tone presentation, they were told, “If the tone bothers you, there is a way you can turn
it off, but you must figure it out yourself”. It did not take long for the participants to realize the remote beside them controlled the computer. The researcher (with a remote) randomly turned the tone on after the participant had turned it off. The participant then turned the tone back off when they wanted to. This cycle of tone-on/tone-off continued throughout the experiment. Therefore, the tone was on for different durations throughout the experiment and was also different for all NLH participants. All NLH subjects’ responses were recorded using a computer program called Audio Hijack Pro. Therefore, each NLH participant had a different recording of tone-on/tone-off intervals. The amount of total time the participant was subjected to the tone varied.

For the LH group, a different procedure was followed. All NLH participants were “yoked” to a LH participant. Therefore, the recorded tone-on/tone-off intervals that the NLH participant had created during their experiment was presented to a yoked LH participant. If the participant had not complained about the tone within one minute of tone presentation, they were told, “If the tone bothers you, there is a way you can turn it off, but you must figure it out yourself”. However, the LH group was led to believe they had control over the tone, by using the remote; their remote did not actually control the computer.

For both conditions, once they completed the word search or 10 minutes had passed, they were asked to read the following instructions and fill out the next questionnaire – The State Anxiety Scale. Once they completed this, they were given the debriefing form to clarify what this experiment was examining. Essentially, there were four conditions: internal LofC-LH; external LofC-LH; internal LofC-NLH; and external
LofC-NLH. After all data was collected, appropriate scoring for the scales was followed and further statistical analyses were completed to examine the results.

Results

A 2x2 between-subjects ANOVA design was used to examine the relationship between locus of control, learned helplessness and state anxiety. For the State Anxiety Scale, the higher the scores, the higher the anxiety based on the participants' ratings of each question. The range of possible scores was 20 to 80. The participants' scores ranged from 26 to 72. For the LofC Scale, a median-split design was used to determine internal and external subjects. The scores on this scale ranged from 2 to 19. The range of possible scores was 0 to 23. Higher scores reflect higher externality. No main effects or interactions effect were found. These results can be found in Appendix B, Table 1.

Mean scores of state anxiety can be found in Figure 1. As opposed to what was expected, the NLH group showed higher anxiety scores in both internal and external LofC groups. Furthermore, NLH-external experienced the most anxiety of all four experimental groups. Externals also showed higher mean scores for state anxiety than internals; however, the differences were not significant. Means and standard deviations can be found in Appendix B, Table 2.

Discussion

This study was done to examine the effects of learned helplessness on state anxiety and to determine if LofC would affect these results. Unfortunately, the hypothesis was not supported, as no main effects or interaction effect were found. In fact, the results in Figure 1 depict the exact opposite of what was hypothesized.
Figure 1. Mean scores of state anxiety for the four experimental groups, NLH representing the non-learned helplessness condition and LH representing the learned helplessness condition.
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There were many problems with the tone presentation that could have skewed the results. Not all subjects were so bothered by the tone; in some cases, they did not turn off the tone even once. Perhaps, the tone was not played loud enough or it should have been played through earphones that were placed directly in the participants' ears. A further pilot study should have been conducted to ensure that the tone was appropriate and irritating enough for the situation. Another limitation about control over the tone was that once the NLH subject realized the remote controlled the tone, most subjects kept the remote in their hand and turned off the tone immediately after onset. Therefore, the recordings for some NLH individuals were not as irritating near the end, since the tone was not on for long periods of time. The tone was deemed more annoying through observations during experimentation, when it simply played continuously without turning off.

The NLH group could have interpreted their experimental condition as not having control over their environment. Even though they could temporarily turn off the tone, it was unpredictably turned back on, which can be construed as not having control. On the other hand, the LH condition quickly realized that the remote they had did not control the computer. They endured the tone and possibly were not as bothered by it because they knew there was nothing they could do about it. The NLH knew they could temporarily gain control, but overall, they did not control tone presentation. It could be just as irritating when the researcher continued to turn the tone back on, when the subject believed they had relieved themselves from it. A better paradigm for tone presentation is necessary to gain better results for this experiment.
The sample used for this study was not a good representation of the general population. Only university students were used with a very restrictive age range. Especially since it was a 2x2 between-subjects ANOVA design, generally having more subjects would have bettered the effects of this study. Another sampling issue was the female to male ratio. Since sex differences were not being observed, little attention was paid to the female to male ratio when distributing the experimental booklets. Males and females could be affected by learned helplessness differently. For instance, through qualitative analysis, one female participant got so frustrated with the tone, she threw the remote. On the other hand, one male participant did not attempt to control the tone at all and simply endured it. This is not conclusive, but is just an example of the possibility of males and females being affected differently by learned helplessness.

Not all subjects were placed in a controlled setting for their experiment. Therefore, there was little control over extraneous variables during experimentation. This occurred due to a time constraint in completing the research for this study. With a more flexible schedule, all subjects should have been placed in the same experimental setting, to control for possible distractions. Considering the study at hand, distractions could have had an impact on the results. Another possible reason for the insignificance of this study is the amount of exposure to the tone in the learned helplessness condition. Perhaps the amount of time individuals were in the LH condition, which was approximately 10 minutes, was not sufficient enough. This limitation is also a result of the time constraint to collect the research data. As well, all subjects were tested at different times in the day. People could possibly get more irritable later in the day, as they become more tired. Thus,
individuals who were tested at night could have had higher anxiety than those tested in the daytime, due to tiredness.

The limitation of using self-report measures is that the individuals could have answered the questions in a socially desirable manner. A social desirability scale, such as the Eysenck Personality Inventory LIE Scale, should have been included in the experimental booklet to ensure individuals were not answering the questions to seem more socially desirable. Having this scale could have increased the validity of the participants' responses. Even though the State Anxiety Scale specifically asks for feelings at that moment in time, individuals can have other problems in their lives that are affecting their anxiety at the specific time of test-taking. For instance, if an individual is stressed over a school assignment right before the experiment, anxiety scores could be high due to this, rather than the experimental condition. There are many factors that could have affected state anxiety including tiredness, stress from school or personal life, hunger, mood, and so on. These factors could have influenced the answers on the State Anxiety Scale.

Further experimentation should better the experimental design of this study. Since this generation is saturated with iPods, individuals are accustomed to loud noises and basically desensitized to perceived loudness. Using earphones for tone presentation would be a better design for the LH group. Studies should be done to examine whether males or females would be more helpless in a learned helplessness situation. Another interesting study would be to compare the responses to learned helplessness between different age groups. Furthermore, are individuals more susceptible to irritation at nighttime versus daytime, due to tiredness? This would also be another interesting
experiment. Learned helplessness is an fascinating variable to examine in humans and should be further investigated.
References


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Appendix A

University Life

Find all the words listed below. Inform the researcher upon completion.

Figure 2. The word search used for all experimental conditions. This was a meaningless task, it was just used to provide a situation to subject the participants to the tone.
Appendix B

Table 1. The Summary Table of the 2x2 between-subjects ANOVA.

<table>
<thead>
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<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
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<td>Locus of Control</td>
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<td>1</td>
<td>100.00</td>
<td>0.77</td>
<td>0.39</td>
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<tr>
<td>Learned Helplessness</td>
<td>196.25</td>
<td>1</td>
<td>196.25</td>
<td>1.52</td>
<td>0.23</td>
</tr>
<tr>
<td>LofC * LH</td>
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<td>27.39</td>
<td>0.21</td>
<td>0.65</td>
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<tr>
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<td>129.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
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<td></td>
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</tbody>
</table>

Table 2. Means and standard deviations of state anxiety scores for the four experimental groups.

<table>
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<th>State Anxiety Score</th>
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<th>Non-Learned Helplessness</th>
</tr>
</thead>
<tbody>
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<td></td>
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<td>External ($n_2=7$)</td>
</tr>
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<td>$M$</td>
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<td>42.14</td>
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<td>$SD$</td>
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