Article: Results

ตารางเรียน

ครั้งที่	วันที่	หัวข้อ	คะแนน	การบ้าน
9	22/3/2565	Article: Results + submit methodology	5	Drafting your experiment and results
10	29/3/2565	แยกแต่ละวิชา		
11	5/4/2565	Article: Conclusions and future work + submit experiment and results	5	Drafting your conclusion and future work
12	19/4/2565	แยกแต่ละวิชา		
13	26/4/2565	แยกแต่ละวิชา		
14	3/5/2565	แยกแต่ละวิชา		
15	10/5/2565	แยกแต่ละวิชา		

Example: Article

Designing a Video Game to Measure Creativity

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E. Krebs, C. Jaschek, J. von Thienen, K. -P. Borchart, C. Meinel and O. Kolodny, "Designing a Video Game to Measure Creativity," *2020 IEEE Conference on Games (CoG)*, Osaka, Japan, 2020, pp. 407-414, doi: 10.1109/CoG47356.2020.9231672.

Review : Introduction

- Stating the purpose of the work in the form of the hypothesis, question, or research problem

This makes scaling studies to include a larger, possibly international audience difficult. Second, in most standard creativity tests responses of participants need to be judged by experts on dimensions such as response originality and flexibility. Evaluating a participant's test responses is typically more time-intensive than taking the test itself. Third, the non-automated rating procedure by human experts is problematic with regard to measurement reliability: a test response that one expert finds original can be considered mundane by another. Fourth, some standard creativity tests are based on self-reports. Test-takers can cheat easily by simply claiming more creative achievements than they have produced in their lives. Fifth, many creativity tests are conducted in an artificial, formal setting, and participants are asked to perform behaviors that rarely ever occur in real life, such as thinking up uncommon uses for everyday objects. Here the question of ecological validity becomes pertinent and it would seem favorable if researchers could assess creativity as occurring in real life, or more natural settings (at least, in addition to more traditional creativity assessments).

Review : Literature Review

- Provide a description, summary, and critical evaluation of these works.

In this section, we provide a brief overview of how creativity is commonly defined and measured. We also review games as a medium for creativity.

A. *Creativity Theory*

According to the standard definition, a solution is creative when it is novel and effective [1], [5].

Novelty means that a solution is uncommon, original, unique. Novelty can be assessed on individual and aggregate levels [6]–[8]. When a person comes up with a so-called "P-creative" solution, they are having an idea for the first time in their life; and the person develops the solution themselves instead of learning it from someone else. However, in the case of P-creative solutions, it can be the case that the idea was

Review : Methodology

- The method section answers two main questions:
  - How was the data collected or generated?
  - How was it analyzed?

> IV. METHOD
>
> In this section, we first share some insights on how a pilot study informed the main study. We then provide demographic data from participants of the main study, review the instruments used and the study procedure.

Collect data

Review : Methodology

How was it analyzed?

The diversity of these chains is the first major measure to assess a player's creativity. It builds on the standard definition of creativity. Each chain that leads to the halting of an enemy is an effective chain. Each chain that differs from others (chain diversity) is a novel chain. This creativity score is defined by the following function, where N is the number of chains:

$$\sum_{i=0}^{N} \sum_{j=i+1}^{N} \frac{Levenshtein(chains[i], chains[j])}{(N(N-1))/2}$$

We use the Levenshtein distance, a metric to determine the difference between two strings. The Levenshtein distance is the minimum amount of single-character edits needed to transform one string into another. Edits can be character insertions, deletions, or substitutions. For example, the Levenshtein distance between "tower" and "tree" is 3. Two characters are substituted (o and w) and the character r is deleted.

Compute creativity score

Results : Designing a Video Game to Measure Creativity

- Results
  - Overview
  - Descriptive statistics

Table I provides an overview of key variables in this study.

Variable	Min	$\bar{x}$	Max	s
AUT Fluency	5.0	8.0	17.0	3.1
AUT Flexibility	4.0	7.1	13.0	2.3
AUT Originality	1.0	2.9	4.0	1.0
Levenshtein Score	0.8	1.4	2.3	0.5
Game Score	71.0	117.6	178.0	28.9

TABLE I

DESCRIPTIVE STATISTICS REGARDING KEY VARIABLES IN THE MAIN STUDY (N = 17)

- Pattern in the Data
  - Correlation among AUT, Levenshtein Score and Game score

		1	2	3	4	5	6
1.	AUT Flexibility	1					
2.	AUT Fluency	0.95*	1				
3.	AUT Originality	0.14	0.20	1			
4.	Levenshtein Score	0.57*	0.54*	0.13	1		
5.	Game Score	0.36	0.34	0.12	0.06	1	

TABLE II

THE TABLE SHOWS PEARSON CORRELATIONS, EXCEPT FOR AUT ORIGINALITY, WHICH IS CACULATED WITH KENDALL'S TAU. * $<$ .05 SIGNIFICANCE

  - Correlation among Levenshtein Score, game score and game experience

		1	2	3
1.	Levenshtein Score	1		
2.	Game Score (Performance)	0.07	1	
3.	Gameplay Pre-Experience	-0.19	0.00	1

TABLE III

THE TABLE SHOWS CORRELATIONS BY KENDALL'S TAU DUE TO THE ORDINAL SCALE LEVEL OF MEASURES ON GAME PRE-EXPERIENCE

- Groups of variables
  - Factor analysis
    - 2 groups: creativity and regular gameplay

		Factor 1 "Creativity"	Factor 2 "Regular Gameplay"
1.	AUT Fluency	.96	.06
2.	AUT Flexibility	.93	.18
3.	AUT Originality	.44	-.54
4.	Levenshtein Score	.65	.20
5.	Game Score	.39	.60
6.	Gameplay Pre-Experiences	-.53	.65

TABLE IV

LOADINGS OF ORIGINAL VARIABLES ON TWO UNDERLYING FACTORS FOUND WITH A PRINCIPAL COMPONENT ANALYSIS

The results section

- Report the findings of your study based upon the information gathered as a result of the methodology you applied.
- State the findings, without bias or interpretation, and arranged in a logical sequence.
- The results section should always be written in the past tense.

How to Write a Good Results Section

- Research results can confirm or reject the research problem based on your study.
- Be concise
- Use non-textual elements, such as figures and tables
  - Raw data should not be included in the main text of your paper
- Avoid providing data that is not critical to answering the research question.

Example:

One key question concerning the usefulness of this game and the Levenshtein score as a means to measure creativity concerns the impact of game pre-experiences. It could be the case that people who play regularly perform better in Immune Defense, and they might perform more complex and diverse game actions, simply because they know how to play computer games. If such relations existed, high Levenshtein scores might indicate (a) that the participant is creative, (b) that the participant has a lot of gameplay experience, or (c) that both is the case. Therefore, it is important to clarify how Levenshtein scores relate to pre-experience in gameplay. Table III provides an overview.

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Answer research problem

Use non-textual element

Content

- An introductory context for understanding the results
- A summary of your key findings arranged in a logical sequence
- Inclusion of non-textual elements, such as, figures, charts, photos, maps, tables, etc. to further illustrate the findings, if appropriate.
- In the text, a systematic description of your results, highlighting for the reader observations that are most relevant to the topic under investigation
- Use of the past tense when referring to your results.
- Focus only on findings that are important and related to addressing the research problem.

Example:

V. Results

In this section, we overview study results and descriptive statistics, and then analyze patterns in the data.

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Introductory context

Answer research problem

Use non-textual element

Using Non-textual Elements

- Place figures, tables, charts, etc. within the text of the result.
- In the text, refer to each non-textual element in numbered order [e.g., Table 1, table 2; chart 1, chart 2; map 1, map 2].
- Each non-textual element must be numbered consecutively and complete with description [description goes under the figure, table, chart, etc.]
- Be sure that each non-textual element is sufficiently complete so that it could stand on its own, separate from the text.

Example:

One key question concerning the usefulness of this game and the Levenshtein score as a means to measure creativity concerns the impact of game pre-experiences. It could be the case that people who play regularly perform better in Immune Defense, and they might perform more complex and diverse game actions, simply because they know how to play computer games. If such relations existed, high Levenshtein scores might indicate (a) that the participant is creative, (b) that the participant has a lot of gameplay experience, or (c) that both is the case. Therefore, it is important to clarify how Levenshtein scores relate to pre-experience in gameplay. Table III provides an overview.

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Refer the table in text

Table with number and Table detail

Example:

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Problems to Avoid

When writing the results section, avoid doing the following:

- Discussing or interpreting your results.
  - Save all this for the discussion section
- Reporting background information or attempting to explain your findings
  - this should have been done in your Introduction section,.
- Ignoring negative results. If some of your results fail to support your hypothesis, do not ignore them.
  - negative results, and how you handle them, often provides you with the opportunity to write a more engaging discussion section

Problems to Avoid

- Including raw data
- Use phrases that are vague or non-specific, such as, "appeared to be greater or lesser than..." or "demonstrates promising trends that....”
- Presenting the same data or repeating the same information more than once.

Example

		1	2	3	4	5	6
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Negative results

Further statistically significant correlations are not found in this study with N=17 participants. Yet it can be noted that, consistently, all three AUT creativity dimensions relate positively to Levenshtein scores.

Exit Ticket

- https://forms.office.com/r/SsvUXMfXjE
- ทำภายในวันที่ 4 เม.ย. 2565

Homework #5

- Draft your Results (< 1 page)
- Use IEEE template
- Deadline: 18 April 2022