What Determines an Individual's Interests and Motivation?

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ABSTRACT

In this paper, we sought to understand where individual motivation and interests come from and how we can better understand them so that we could better understand how to accomplish our goals. Previous research has found that how interested someone is in a subject can be predicted by their understanding of that subject, positive feedback received, and time spent doing a task on that subject. In our first (correlational) study, we tested the strength of these relationships by examining naturalistic daily changes in their variables longitudinally over a two-week period. We recorded time spent on tasks throughout the day and after each task measured on subjective scales how interested we were in the tasks, positive feedback received on task performance, and level of interest in the tasks. Data pooled across participants showed a significant correlation of interest level with personal understanding, but not with positive feedback nor with time spent on tasks. Based on the strength of correlation found between personal understanding and interest level in our correlational study, we then conducted a second (experimental) study to test for specifically a causal relationship between these two variables. Over a two-week period, we randomly assigned participants each day to either a higher personal understanding condition or a neutral condition and measured the effect this had upon interest level each day. The results of our experimental study showed significant differences found in interest level between conditions. Possible practical applications of our current findings show that having a high personal understanding of a subject increases the likelihood you will be interested in that subject. This was found to be true during our correlational study, and during our experimental study it was found that trying to manipulate one's personal understanding does increase interest levels. In other words it was found that forcing yourself to understand a subject will make you more interested in it. All of this shows that personal understanding (that is how well you understand a subject) is (at least in part) what determines interest and motivation.

1. Introduction

1.1 Research Problem

Motivation and interest are what drive us to accomplish goals. Our motivation for change is what sparks our interest in progress. As well as the fact the most motivated people are often the most successful. By understanding our motivations and interests we can better understand how to accomplish our goals.

Through understanding individual motivation and interest we can gain a better understanding of the world around us and how we can fully realize our life goals to thus becoming a happier healthier society.

1.2 Literature Review

One factor that contributes to interest is an appraised ability to understand a particular subject. In a study by Sylvia (2005) designed to determine if understanding influences interest, sixteen people were designated into two groups: high ability and low ability. Each group was given a questionnaire to fill out, with the first page comprised of seven personality appraisal scale items (e.g., "I am a very insightful person"). The purpose of this first page was to divert the participants from knowing the real aim of this study, which was tested on the second page of the questionnaire. The second page was a task to read a poem and give their thoughts, feelings, and reactions. However, the researchers manipulated the participant's ability to understand by having different introductions for the reading . The low ability group had an introduction that explained the basics of the poem (author, name of the poem, the book it came from), whereas the high ability group was given additional information (the origin and meaning of the words in the title -and an explanation of the subjects in the poem). Their findings indicate that manipulating the participants understanding (how they viewed and understood the poem going into it) significantly affected feelings of interest. Based on these findings one could surmise that an individual's personal feelings of understanding (how well they feel they understand a subject) can predict how interested they are in a particular subject.

Another possible factor that benefits interest is positive feedback. In a study by Tanaka (2001), 448 junior college students were assigned to one of four stories. Students rated the characters in the story on a 0-10 scale based on their levels of interest and motivation to do a task: score of 0 being they have no interest at all and score of 10 being they are very interested and motivated to complete the task. The main characters in these stories were given tasks that varied in the level of interest the characters expressed in them and in the expectation of an extrinsic reward. The results showed that subjects believed positive feedback motivated the character to complete a task more than a situation where one would not expect positive feedback. Based on these findings, it is predicted that increased positive feedback will lead to a higher level of interest and success.

Another possible factor involved with motivation is the time spent completing a task. In an experiment by Thoman et al. (2019), 886 undergraduate students with the median age of 18 were divided into two separate groups. One group was given a boring task of copying letters to another paper and the other group was given the interesting task of finding hidden words in a matrix (a chart with numbers expressions and symbols arranged in columns). This was done to see whether a person can make a boring task interesting by simply doing it for a certain period of time. In both groups it was found that approximately half of the participants who completed the task used strategies to keep themselves engaged and found it interesting by the end.

1.3 Hypotheses

Based on the above literature review, we predicted the following hypotheses:

● Hypothesis #1: If one feels they understand a subject then they will be more interested in said subject.

● Hypothesis #2: If positive feedback is increased then interest will also increase.

● Hypothesis #3: If the time spent on a task increases then interest in that task will increase.

2. Methods

2.1 Participants

The three authors of this paper served as the participants in its studies. The participants ranged in age from 18 to 19 years old, with an average age of 18.5 years, and included three men. The participants were all undergraduate students at Camosun College who completed the current studies as an assignment for Psyc 110 ("Experimental Psychology") and were grouped together due to their mutual interest in what determines an individual's motivation and interest.

2.2 Materials and Procedure

2.2.1 Correlational Study Methods

We first performed a correlational study to test concurrently all of our hypotheses by examining naturalistic daily changes in their variables longitudinally. Each participant kept a study journal with them at all times over this study's two-week period in order to record self-observations of the following four variables: (1) personal understanding, (2) positive feedback, (3) time spent on tasks, and (4) interest.

To measure the variable of personal understanding, each participant recorded their level of personal understanding of individual tasks throughout the day using the 1-5 scale shown in Appendix C. The data was recorded in a journal throughout the day and was compiled at the end of the day with average understanding and average interest level calculated using the results.

To measure the level of positive feedback, each participant recorded themselves based on the level of feedback they received using the 1-5 scale shown in Appendix B, participants record this right after receiving feedback from tasks. This data was recorded daily at the end of the day and was compiled into an average level of positive feedback for the day, if no feedback was recorded during the day no value was applied.

To measure the time spent on an individual task, each of the participants measured, using a stopwatch on their mobile devices, the amount of time (in minutes) spent on individual tasks, and wrote the time down in a personal journal. The total time spent on tasks was calculated at the end of the day, and recorded with the rest of the data.

To measure their level of interest, the participants used the 1-5 scale found in Appendix A. The scale ranged from very interested to very disinterested and was measured after any given task. The participant's level of interest was recorded for each individual task during the day and the average level of interest was calculated using the recorded results at the end of the day. Participants also recorded in their study journals what tasks they were working on.

To assess the strength and statistical significance of associations between variables predicted by our three hypotheses, we performed Pearson product-moment correlations of their predictor variables (personal understanding, positive feedback, time spent on tasks) with their outcome variable (interest). For testing hypothesis #1, we correlated the level of participant understanding of any given task with that participant's level of interest in the same

task. For testing hypothesis #2, we correlated the level of feedback participants received after completing tasks and with their level of interest in the same tasks. For testing hypothesis #3, we correlated the amount of time participants took doing tasks with their level of interest in the same tasks. We performed all of the above correlations separately for each participant as well as using data pooled across all of the participants. For the correlations using pooled data, in addition to using the raw data, we also performed correlations after we had first transformed the data from each participant into *z*-scores in order to standardize differences in averages and variability seen between the participants in their data and thus make them more comparable. A correlation coefficient was considered statistically significant if the probability of its random occurrence (*p*) was < .05 (i.e., less than 5% of the time expected by chance alone).

2.2.2 Experimental Study Methods

Based on the strength of the correlation between personal understanding and interest level found in our correlational study, we then chose to conduct an experimental study to test for a causal relationship between these two variables from Hypothesis #1.

We manipulated the independent variable, personal understanding, over a two-week period by randomly assigning participants each day to either a higher understanding condition or a neutral condition. On high personal understanding (experimental) days, before each task participants thought for at least one minute about how the concepts in the task related to well-understood subjects and ideas. On neutral (control) days, participants approached tasks as normal and did not try to relate concepts to better-understood subjects. For both conditions, interest level

was recorded using a 1-5 scale with the average across each task calculated at the end of the day (no value was imputed on days with no completed tasks). Average interest levels were calculated and recorded at the end of the day based on all tasks completed (no value was imputed on days with no completed tasks).

In order for participants to remain unbiased as to what condition they were assigned to, participants used a random assignment system. Participants flipped a coin each day to determine whether they were in the experimental group (heads) or control group (tails). Heads meant participants were assigned to the high personal understanding experimental group and tails meant participants were assigned to the neutral control group. Personal understanding was manipulated before each task and interest level was recorded after each individual task in order to limit confounding results. Unfortunately, given the nature of the manipulation, participants were unable to accomplish a double-blind procedure for their experiment.

To assess the statistical significance of differences seen in interest level on higher personal understanding experimental days vs. neutral control days, Student's *t*-tests were performed. We performed *t*-tests separately for each participant as well as using data pooled across all of the participants. For the *t*-tests using pooled data, in addition to using the raw data, we also performed *t*-tests after we had first transformed the data from each participant into *z*-scores in order to standardize differences in averages and variability seen between the participants in their data and thus make them more comparable. An average difference between conditions was considered statistically significant if, using a two-tailed distribution (i.e., allowing this difference to be positive or negative), the

probability of its random occurrence (p) was < .05 (i.e., less than 5% of the time expected by chance alone).

3. Results

3.1 Correlational Study Results

As shown in Table 1, interest showed a statistically significant correlation with personal understanding and with positive feedback, but not with time spent on tasks. Time spent on tasks was not found to be significantly correlated with interest using any single participant's data, pooled raw data ($r = 0.18$, $p = 0.293403$; see Figure 3), or pooled standardized data. Positive feedback was significantly correlated with interest using Participant #1's data and using pooled standardized data, but not using pooled raw data ($r = 0.30$, $p = 0.0744808$; see Figure 2). Personal understanding was significantly correlated with interest using Participant #3's data, using both pooled raw data ($r = 0.58$, $p = 0.00013$, see Figure 1), and using pooled standardized data. Personal understanding showed the strongest correlation with interest level using both pooled raw and pooled standardized data.

3.2 Experimental Study Results

As shown in Table 2, the high-personal understanding (experimental) condition showed significantly increased interest levels compared to the neutral-personal understanding (control) condition. Statistically significant differences between these conditions were seen using Participant #3's data ($p = 0.0065161$), pooled raw data ($p = 0.0465434$; see Figure 4), and pooled standardized data ($p = 0.0043896$).

4. Discussion

4.1 Summary of Results

Based on previous research, we hypothesized that increases in three variables would be followed by an increased interest level: the level of personal understanding (Hypothesis #1), the level of positive feedback (Hypothesis #2), and the time spent on tasks (Hypothesis #3). Data pooled across all participants supported the predicted relationship with personal understanding and with positive feedback, but not with time spent on tasks. Personal understanding proved to be the strongest correlation and our experimental findings have shown that a high personal understanding of a subject will increase your interest on that subject.

4.2 Relation of Results to Past Research

Our correlational study was able to predict interest level based on personal understanding, which falls in line with previous research (Sylvia, 2005). Furthermore, our experimental study found that manipulating one's personal understanding leads to an increased interest level. Any limitations of our experimental results were likely due to the somewhat subjective nature of our recordings along with our inability to perform a double blind procedure. Sylvia (2005) found that an individual's personal feelings of understanding (how well they feel they understand a subject) can predict how interested they are in a particular subject. While Sylvia (2005) sampled 16 people for their experiment, we longitudinally assessed these variables in three college students. The similarity of both our conclusions from our correlational study despite using different research designs suggests a relationship

exists between personal understanding and interest level. It was found in our experimental study that forcing yourself to understand a subject/task will increase interest levels in the subject/task. Considering all this, it is likely that personal understanding (that is how well you understand a subject) is a major determinant of interest level.

A strong relationship was found between positive feedback and interest level in our correlational study that is consistent with past research. Tanaka (2001) found that large amounts of positive feedback lead to a higher level of interest. Tanaka (2001) had participants do different tasks such as sports, school, and work. However, our correlational study longitudinally recorded participants doing school work as the task (academic tasks). The fact that we found the same relationship between positive feedback and level of interest despite these differences in methodology speaks to the universality of its relationship.

The inability of our correlational study to predict interest level based on the amount of time spent on a task is not in line with previous research. While Thoman et al. (2019) used a comparison of two tasks, we longitudinally recorded the time spent on academic tasks from three college students and found that time spent on a task did not significantly correlate with increased interest level.

4.3 Implications of Results

We originally conducted the current studies because through understanding individual motivation and interest we sought to better understand the world around us and how we can fully realize our life goals, thus becoming a happier healthier society. Based on our experimental study results we recommend attempting to increase your interest level through manipulating your personal understanding of the subject you are trying to gain interest in.

References

Silvia, P. J. (2005). What Is Interesting? Exploring the Appraisal Structure of Interest. *Emotion, 5*(1), 89–102. https://doi-org.libsecure.camosun.bc.ca:2443/10.1037/1528-3542.5.1.89

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Thoman, D. B., Sansone, C., Robinson, J. A., & Helm, J. L. (2020). Implicit theories of interest regulation. *Motivation Science, 6*(4), 321. https://doi-org.libsecure.camosun.bc.ca:2443/10.1037/mot0000160

Table 1

Correlation coefficient (r) values, with number of daily trials (n) per correlation in brackets.

Variables correlated	Participant #1	Participant #2	Participant #3	Pooled raw data	Pooled standardized data
Personal understanding & interest level	0.53(12)	0.35(13)	0.68(11)*	0.58(36)*	0.51(36)*
Positive feedback & interest level	0.59(12)*	0.45(13)	0.50(11)	0.30(36)	0.51(36)*
Time spent on tasks & interest level	0.31(12)	0.23(13)	-0.10(11)	0.18(36)	0.16(36)

* $p < .05$.

Table 2

*Descriptive statistics on interest level for high-personal understanding and neutral understanding conditions.*

Condition	Statistic	Participant #1	Participant #2	Participant #3	Pooled raw data	Pooled standardized data
High personal understanding (experimental)	Mean	3.98	3.25	3.50	3.49	0.45
	S.D.	0.24	0.46	0.58	0.52	0.61
	n	4	8	4	16	16
Neutral personal understanding (Control)	Mean	3.44	2.58	2.00	2.92	-0.60
	S.D.	0.66	0.79	0.00	0.85	1.04
	n	6	4	2	12	12

Interest level was measured on a 1-5 scale of unpleasant feelings, where 1 = no understanding and 5 = fully understand.

* $p < .05$ for comparison of high-personal understanding condition with its respective neutral understanding condition.
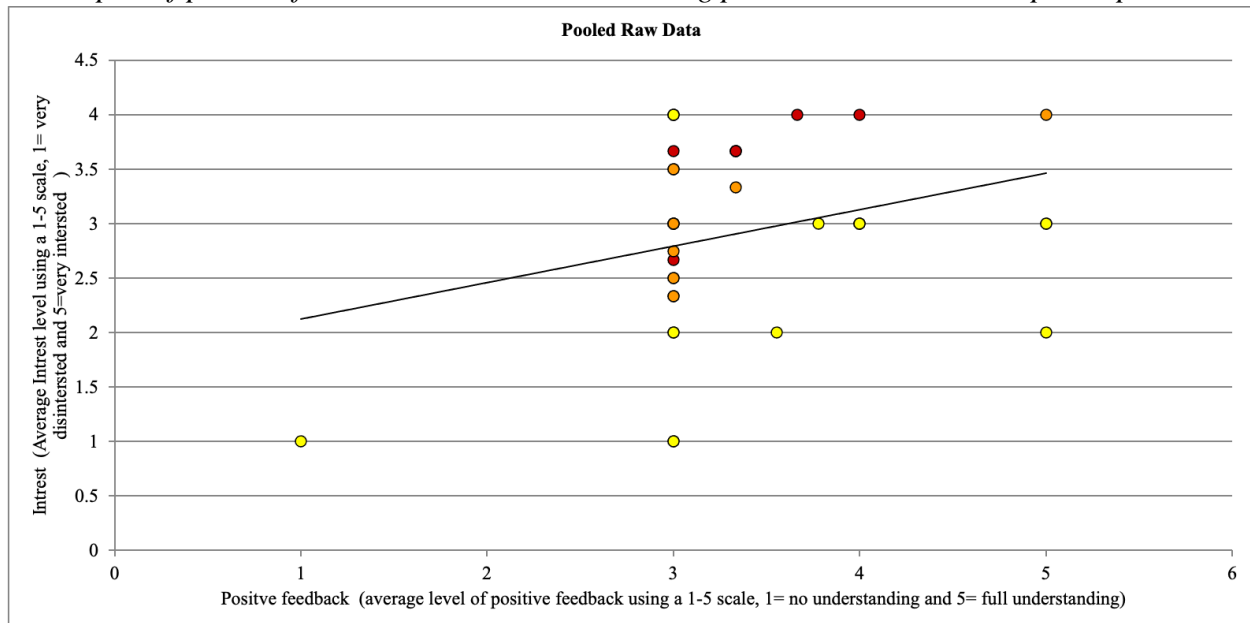
Figure 1

Scatterplot of personal understanding and interest level using pooled raw data across participants.
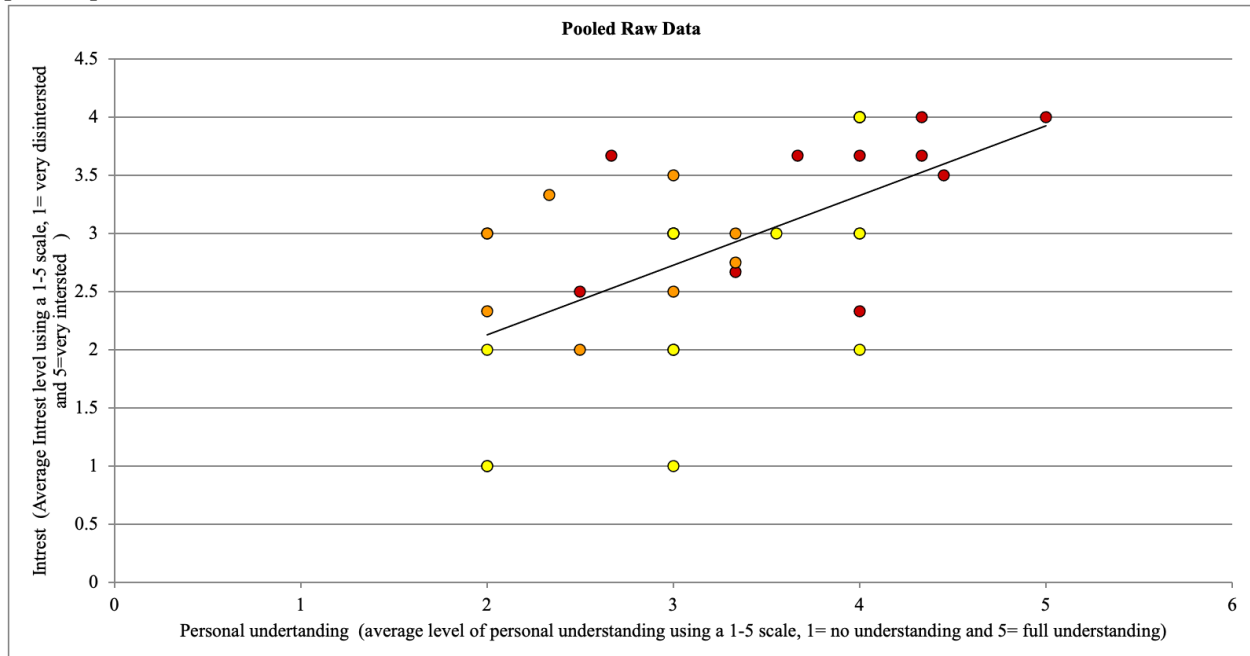
Marker color indicates which participant data is from: red = participant #1, orange = participant #2, and yellow = participant #3. Some data might not be visible in the figure due to overlapping markers.
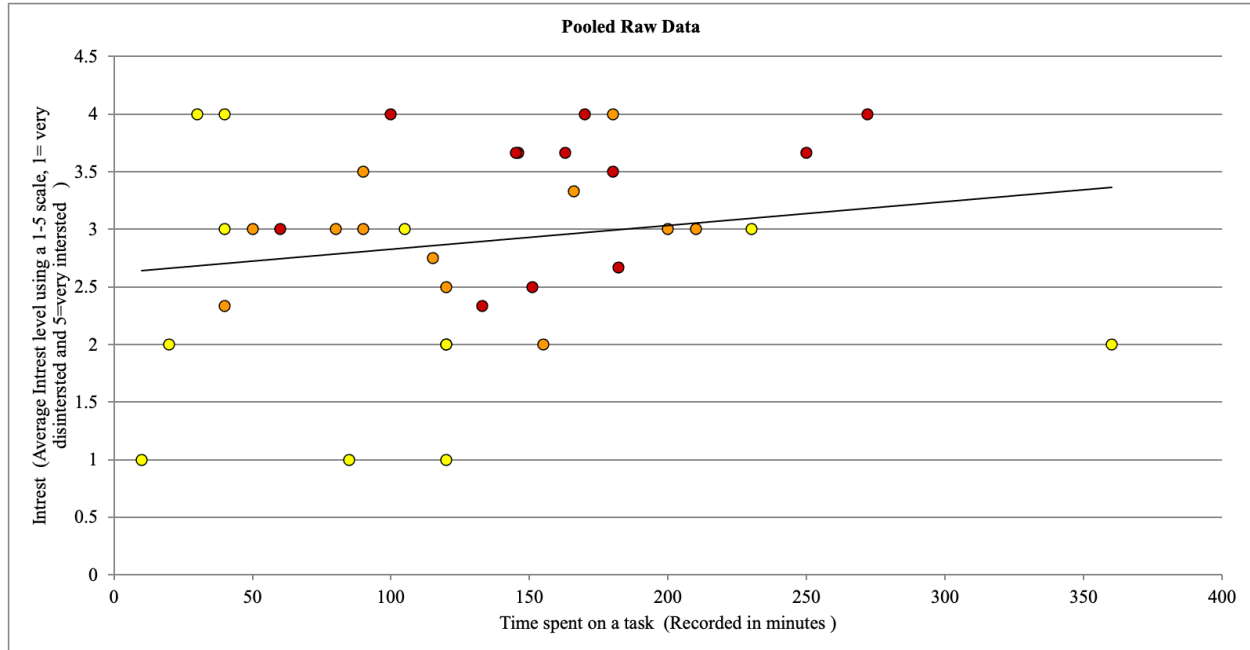
Figure 2

Scatterplot of positive feedback and interest level using pooled raw data across participants.

Marker color indicates which participant data is from: red = participant #1, orange = participant #2, and yellow = participant #3. Some data might not be visible in the figure due to overlapping markers.

Figure 3

Scatterplot of time spent on tasks and interest level using pooled raw data across participants.

Marker color indicates which participant data is from: red = participant #1, orange = participant #2, and yellow = participant #3. Some data might not be visible in the figure due to overlapping markers.

Figure 4

Bar graph of average personal understanding across high-congener and neutral-congener conditions using pooled raw data from participants, with error bars showing ± 95% confidence levels, and with an overlapping scatterplot of data from each participant.
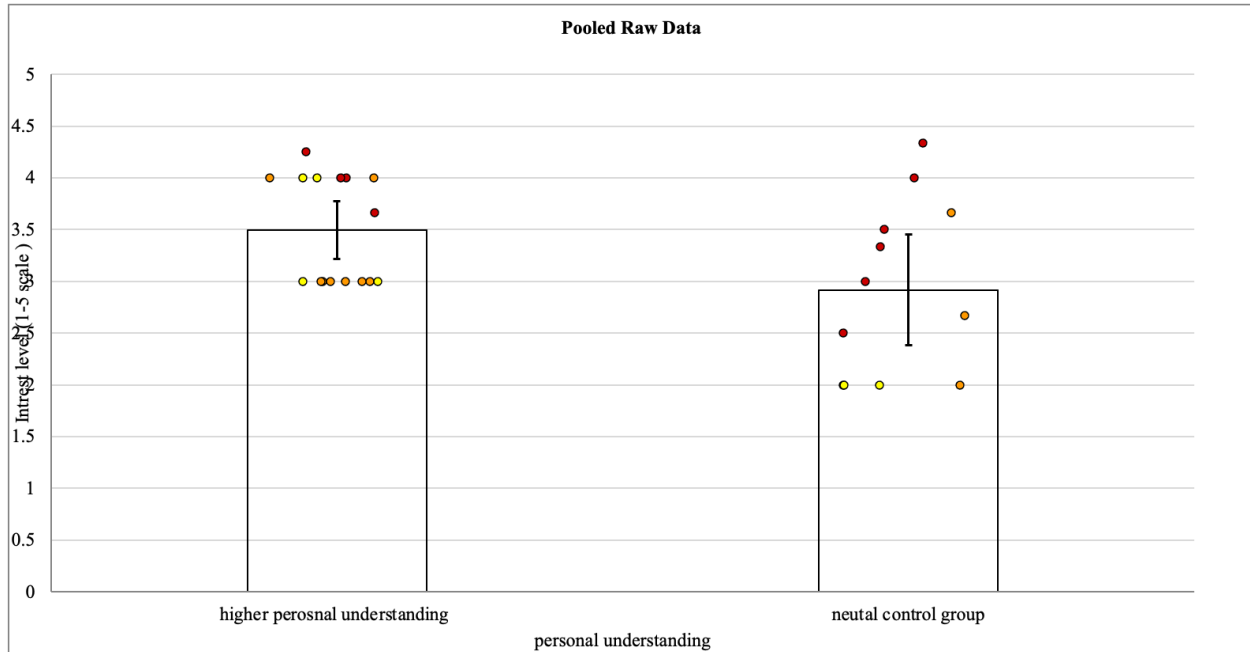
Marker color indicates which participant data is from: red = participant #1, orange = participant #2, and yellow = participant #3.

Appendix A

Scale for measuring the level of interest felt.

5: very interested	4: somewhat interested	3: neutral	2: somewhat disinterested	1: very disinterested

Appendix B

Scale for measuring feedback

5: very positive feedback	4: somewhat positive feedback	3: neutral feedback	2: somewhat negative feedback	1: very negative feedback

Appendix C

Scale for measuring personal understanding

5: fully understand	4: partly understand	3: neutral understanding	2: partly confused	1: no understanding