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# Confirming the results from Chinese questionnaires at University

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**Abstract**

Chinese questionnaires are the most common way social science researchers use to achieve their research goals in Taiwan. However, can these questionnaires truly reflect the denotations of the subject? This study aims to testify the results of the questionnaires through the natural science by using an eye-tracker experiment. From the verified results of both researches the following finding as listed: the eye scanning trail and the reading order trail from the questionnaire have a matching rate of merely 38.89%.

**Key words:** Chinese questionnaire, experimental research, eye-movement, square words

## Introduction

> *"The major development of the 21century, so far, is recognition that the use of all survey modes continues, and none seem likely to disappear. Each has strengths and weaknesses, allowing it to do things other modes cannot do."* [1]

The main research method in the early stages of social science was qualitative studies, which was to conclude the collected information by deduction or induction [2]. To common readers, it's tough to understand whether the process is correct or logical. In recent decades due to the evolution of computer technology, the researchers no longer need hours or days to process a complicated math equation, but with a touch of a button they have the solution, thus recent social science research methods have switched to quantify studies.

In contrast, the main research method for quantify studies is through questionnaires, running these results through statistical methods to describe, testify and for auxiliary explanation, thus the results or conclusions are much more specific and persuasive than the ones of qualitative studies, but during the survey the researcher is hypothetical in which the subjects is completely honest while answering or filling out the questionnaire [3]. Are the subjects or interviewee hundred percent honest when responding to these questions? This issue is what this study is attempting to solve. On the other hand, natural scientists mainly use very objective experimental research methods to persuade the public [2], in other words, they use experiments to testify their hypotheses.

## Survey Methods

According to how the questionnaire is conducted, the methods of the questionnaire can be split into three classifications: Person-Administered Surveys, Self-Administered Surveys and Mixed-Mode Surveys [4][5].

The conduction of Person-Administered Surveys is subdivided into four types in detail: Mall-Intercept Interviews, In-Office Interviews, In-Home Interviews and Telephone/ On-Line Interviews.

The conduction of Self-Administered Surveys is also subdivided into four types in detail: Group Self-Administered Surveys, Drop-Off Surveys, Mail Surveys and Computer-Administered Surveys.

Mixed-Mode Surveys are conducted according to the needs of the study, by collecting the data from the surveys mentioned above [6].

Every survey method has its pros and cons, none of them are certain to be the best or most accurate, however, according to Denscombe's (2010) research strategies, the researcher can find the most suitable survey method for our research using these three steps: make a research paradigm, build a research design and acknowledge a specific research problem [3]. Following these steps, the subjects for this study are university students, whether or not these students are answering what they truly think regarding one topic, the highest liability Mall-intercept Interviews Method was adopted in the study to conduct the respondent [3][5][7].

## Eye-tracking Techniques

> *"If you want to understanding a person, watch his eyes because the eyes cannot cover the devil ……"*
>
> *Meng-zhi (Lielou one).*

Confucianism Meng-zhi said that generally you can tell what a person is thinking by observing their eyes. Thanks to modern technology, the wise words of ancient men can finally be witnessed through the eye-tracking device. The following paragraphs are discussing how the researcher can find out what experimental material to be use on what people want to express by tracking their eye movements, and what people actually want to respond to the questionnaires as well.

According to the message processing theory, humans are triggered 80 percent by the visual environment [8], when the eyes are stimulated, they send information rapidly back to the brain for further cognition processing, e.g. distinguishing, comprehending, memorizing and so on, then it throws this information back to the eyes and other organs to make a response, the response of the other organs are based on the control from the eyes. Particularly, once the subject finished the eye-tracker experiment, then shortly afterwards handing them the questionnaire to confirm their reading order of the square shaped terms (experimental materials), at the same time the subject also drew a pattern in the order what they read the materials. When the subjects' vision comes to an understanding of the square shape terms, their eyes will scan for a significant order, lastly moving less and less between the

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spaces, thus, the order of our sights' "first gaze", "fixation" and "saccade" will lead to a scanning phenomenon. This will represent the test subject's scanning trail for the words and terms.

The most common device used for eye-tracking techniques is the eye-tracker. The following paragraphs descript the fundamental laws, the orbital index, measurement, and operation methods and so on of the eye-tracker. Then analyze the data from the orbital scanning and reading order, the orbital scanning and gender difference, orbital scanning and grade difference and so on.

### Measurement Principle and Types of Orbital

So far the commonly used eye-tracking technical method can be split into four types: Infra-red Oculargraphy, Scleral Search Coil, Dual-Purkinje Image Tracker and Video-Based Eye Tracker [9][10].

The Video-based Eye Tracker measures the eye's movement by using a camera to capture the eye's position. This method has the non-invasive advantage, with great 2 milliseconds time and 0.01° space resolution, the disadvantage is the subjects will feel uncomfortable if they have the tracker on for over two hours. As for the Scleral Search Coil, the method it uses is the principle of electromagnetic induction to track the eye's movement, although it has a great 1 millisecond time and 1° space resolution advantage, but because it is an invasive measurement, it is more likely to be affected by the participants immediate condition (e.g. eye secretions), so it is not suitable to be used for over 30 minutes, what's more is this device is a soft lens with double structure. It might affect the participants vision for safety, thus it is rarely used. The Dual-Purkinje Image Tracker is designed using the principle of a light source to enter the eyeball and crystalline lenses and the difference in the refractive index of each tissue, this measurement method has the advantage of being especially accurate, and is non-invasive, but its disadvantage is when the eyeball starts to move, the crystalline lenses will be effected by the eye secretion and delayed slightly, it cannot make the same movements as the eyeball, in the contrary when the eyeball has already stopped moving, it will cause an overshoot, thus when calculating the eye movement it will not be as accurate as other eye-tracker. Infrared Oculargraphy uses the principle of infrared- light sources in the corneal edge's reflex ion difference, because infrared will almost completely reflect on the white sclera, yet to the black pupil and iridescence the reflection is very low, the infrared receiver will convert the reflected infrared light into current signals, after differential magnifying the signals from up, down, left and right, it can use the magnitude of the signal to judge the eye movement degree. It has a row of LED infrared light sources and receivers on the frames, and then secures the irradiation degree to surround the iris, to receive the eye's movement and speed. Thus, other than possessing the non-invasive measurement method advantage, it also has an excellent space resolution and wide measurement range, so for this study the researcher adopts this eye-tracking device for the research instrument.

### Experiment Equipment and Operative Procedures

For this eye-movement experiment it is necessary to prepare the following devices: infrared camera, laptop and camera frame (to support the camera). The laptop is used to display the experimental images and connect to the eye-tracker to record the eye movements. The subject is asked to sit in front of the computer screen to view the pictures (such as Fig. 1), the examiner shall sit on the right and observe the data being recorded, also enforce correction and give orders to the subject of when to start recording eye movement and so on. The eye movement for every picture displayed from start to finish is recorded then is immediately sent to the computer for further analyzation.

Fig. 1 Eye-movement Live Test

Each time before executing an experiment, the examiner must recalibrate to retrieve the correct data from the eye scanner, if you wish to know where the eye is fixated at the moment you must recalibrate before the experiment. The examiner make nine dots in total one the screen (center, up down left right, top right, top left, lower right, lower left etc.), these nine dots will each appear randomly for the subject to fixate on, and at that moment they must be fixated on the dot that has appeared. By asking the participant to gaze at this located dot, the corresponded image on the infrared camera will automatically send both of the information to a calculation application, and the results will be displayed as the participants fixate on each of the dots that appeared on the screen, as long as there are over four positions that are certainly on point, then the calibration is successful [11].

### Experimental Procedures

After the subject has finished signing the consent and before starting the experiment, the examiner will explain to them that they will be viewing two images and filling out one questionnaire. Before viewing the images, the examiner will be calibrating with the eye-tracker which will take slightly longer, approximately two to three minutes, and the whole experiment is estimated to be completed within five minutes, ensuring that the subject fully understands the complete procedure before going forth with the experiment.

The experiment will be split into three major sections as follows:

**Section One**:

First circle which group (either A or B) the participant belongs in. Next, before the subject views the pictures, notify them of the following:

"Please let us know when you have finished viewing the picture by moving your finger (at this moment the examiner should demonstrate how to indicate), then the examiner will switch to the next picture for you."

**Section Two**:

During the experiment, explain to the subject:

Tell them before they view the first picture:

"Please view the square words and read them in the order which you think is most sensible, but do not read them aloud!"

Once complete, indicate with your right-hand finger, and the examiner will switch to the next picture for you.

Tell them before they view the second picture:

"The same as the first, and do not read them aloud!"

Once complete, the experiment will come to an end.

**Section Three**:

After viewing the two pictures, follow up with these questions immediately whilst making a successful record: Take a paper copy of the first picture (the same square words as the one shown on the computer) and ask the respondent to read it aloud, meanwhile the examiner will draw the respondent's reading order onto the paper copy.

Then take a paper copy of the second picture (the same square words as the one shown on the computer) and ask the respondent to read it aloud, meanwhile the examiner will also draw the respondent's reading order onto the paper copy.

Lastly, asking her/him: "What year are you currently in at university?" Then circle male or female on her/him questionnaire.

### Eye-movement Index

The study is mainly analyzing the scanning trail of the eyeball according to the first-gaze, fixation position and saccade forward. This eye-tracker will record the eyeballs every position in every moment, using the X & Y axis and the unit of pixels, sending the processing to the application that provides frontal process to distinguish the two-required eye-movement index for this study: fixation and saccade. At this time the data will be known as 'the event', such as fixation, saccade or blinking and so on, according to the results of these fixation and saccade, the data content for the eye-movement may appear interlaced between fixation (average position, fixation time) and saccade (the position before and after saccade, the saccade time). Based on the purposes of the study, circling the areas of the cubic Chinese media for analyzing, then the researcher got the results of whether or not each character was fixated on, the fixation time, the fixation amount, the fixation position before every character was fixated on and the saccade direction before every fixation and so on.

The third eye-movement index is: Gaze, the total amount of fixation time the eye-ball spends on entering and before exiting each character. When never viewing the characters on the left or right before viewing this character, this gaze is called first gaze. The rest of the gazes, no matter whether it's coming back to the same character again after viewing other characters, is called second-gaze.

### Experimental Materials

Multiple palindrome words were selected for university students to read according to the palindrome theory, then randomly selected two sets of palindrome words ("Shan Lu Shen Yuan, 山路深遠" and "Lin Xian You Yun, 林閒悠雲") as materials for this experiment. The specialty of the palindrome words is that no matter what order it's in, every combination will still be logical to university students. For example, 'Shan Lu Shen Yuan, 山路深遠"means the mountain road is dark and long; "Lu Shen Yuan Shan, 路深遠山" means the road is dark and the mountain is located so far; "Shen Yuan Shan Lu, 深遠山路"means the dark and long mountain road; "Yuan Shan Lu Shen, 遠山路深"means the road in the far away mountain is long.

### Methodology

The study uses the research design of casual analyses, such as Fig. 2, and is aimed at the same experiment material that separately conducts the eye-movement experiment method and questionnaire survey method (independent variable: research types), to check the influence against the reading type (dependent variable), then analyzes and compares the data collected from both experiments, to discuss whether the gender (mediate variable) of the subject will affect the reading styles.

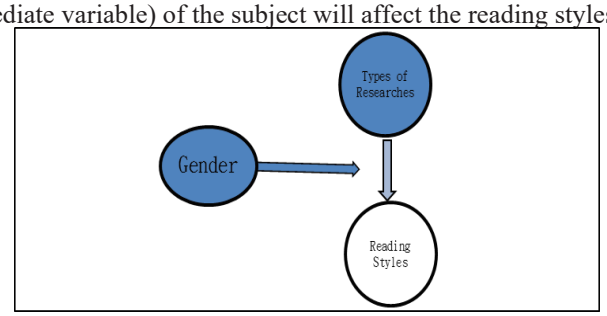


Fig. 2 The Structure of Research Design

For this questionnaire the researcher adopted the Mall-intercept interview survey method because of its high liability, and the experimental method uses the eye-tracker to analyze the eyeball scanning trail to see whether it is consistent with the ones on the questionnaire.

Multiple palindrome terms (experimental materials) were selected based on the palindrome theory for the pilot test, to make sure these materials understood on any kind of Chinese combinations, then through the eye-tracker (research tool) the researcher examined whether the subject's eye-scanning trail (reading order) on the square shaped combinations (palindrome terms) match the ones on the questionnaires. The samples of the pilot test were first structured by an expert panel to discuss the meaning of the palindrome letters, then set up into palindrome letters through a random computer combination (such as Fig. 3).

深 山
路 遠

Fig. 3 Square Words I

The experiment design is represented by the arrangement direction of both sets of palindrome letters: Horizontal and vertical, then combine the two arrangement methods into the palindrome letters arrangement to verify the reading order of the palindrome letters to represent the whole study. This research method is conducted through the experimental research method to see the visual movement route of university students during their Chinese vocabulary processing, to lower the experimental error margin, the researcher randomly split subjects into groups A and B to conduct the eye-movement experiment: Let the subjects of group A view picture I of the Chinese square-palindrome words first, then look at picture II

square-palindrome words; Let subjects of group B view picture II of Chinese square-palindrome words first, then look at picture I of square-palindrome words.

During the whole study the researcher put the experimental method as priority, after the subject was finished viewing the Chinese square-palindrome words pictures, immediately used the questionnaire to confirm their reading order for the square-palindrome words, the examiner should simultaneously draw the participants reading order onto the questionnaire, and let the confirm pattern was correct before coding the record.

**Statistical Analysis**

The university students were randomly selected to be the subject from a certain university in Taipei, the 100 subjects were selected for mall-intercept interviews to conduct the eye-movement experiment and questionnaire survey on campus.

**Data Analysis of the Eye-movement**

According to the research purposes the researcher gave the position of each square word a coding, e.g. the "Shen, 深" in the top left corner in Fig. 3 as 1; the "Shan, 山" in the top right corner as 2; 3 for the "Yuan, 遠" in the bottom right corner; 4 for the "Lu, 路" in the bottom left corner. The researcher used the first-gaze in the eyeball scanning path (trail) as the dividing starting point for the square word, which could be split into roughly four groups:

The first type is Group Z, the trail: 1 as the first-gaze, then in the direction of 2→4→3 (As Fig. 3 shows, the Z reading order would be "Shen Shan Lu Yuan, 深山路遠").

The second type is Group N, the trail: 2 as the first-gaze, then in the direction of 3→1→4 (As Fig. 3 shows, the revers-N reading order would be "Shan Yuan Lu Shen, 山遠深路"); or 1 as the first-gaze, then in the direction of 4→2→3 (As Fig. 3 shows, the upside down N reading order would be "Shen Lu Shan Yuan, 深路山遠").

The third type is Group X, the trail: 1 or 2 as the first-gaze, then in the crisscrossing direction of 3 or 4 (As Fig. 3 shows the first-gaze is 1, the X reading order would be "Shan Lu Shen Yuan, 深遠山路" or as Fig. 3 shows the first-gaze is 2, then the X reading order would be "Shan Lu Shen Yuan, 山路深遠").

The forth type is Group U, the trail: Any coding as the first-gaze, then in the direction of a circle (both anti and counterclockwise) (As Fig. 3 shows, the U reading order would be "Shen Shan Yuan Lu, 深山遠路" so on and so forth).

After every subject finished viewing both square-palindrome words pictures, the 200 pictures of the hot-area data were collected. Then according to the fixation of 50 milliseconds and the first-gaze of 20 gaze, the fixation position and saccade direction in three eye-movement indexes of every picture of the hot-area data, the researcher conducted an analyzation of the scanning trail (such as Fig. 4~6 shows, using an Z-type eye scanning trail as an example at fixation 50, gaze 20), Fig. 4 shows that the eyeball stops at the first character "Shen, 深" in advance, then stops at the second character "Shan, 山", in Fig. 5 the eyeball stops at the third character "Lu, 路", and only then being able to display the concluded trail shown on Fig. 6 of "Shen Shan Lu Yuan, 深山路遠" proves that the data is valid, and the analyzed results show 126 pieces of valid data, a success rate being 63%.

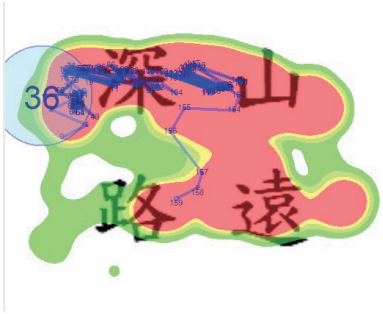


Fig. 4 Example of Z-Type scanning trail 0~159

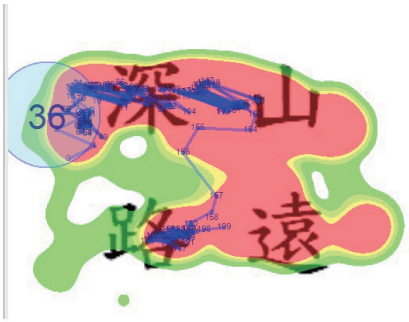


Fig. 5 Example of Z-Type scanning trail 0~199

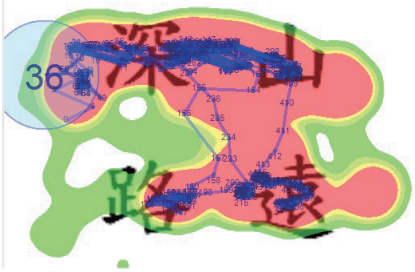


Fig. 6 Example of Z-Type scanning trail 0~499

Table 1 is the statistic type table for the eye-tracker scanning trail, with the type Z trail most common, 69 subjects, taking up 54.76%; the type U trail coming next with 27 subjects, taking up 21.43%; the type X trail has 17 subjects, taking up 13.49%; the type N trail has 13 subjects, taking up only 10.32%.

TABLE 1
STATISTIC TYPE TABLE FOR THE EYE-TRACKER SCANNING TRAIL

| Scanning Trail types | Person(s) | Percentage (%) | Remarks |
|---|---|---|---|
| Z | 69 | 54.76 | |
| N | 13 | 10.32 | Including reverse-N & anit-N |
| X | 17 | 13.49 | |
| U | 27 | 21.43 | |
| Total | 126 | 100 | |

**Data Analyzation of the Questionnaire**

The study used the interview method to conduct data collection from questionnaires, by using the interview method

asking the subject how they read two sets of palindrome words, finally the retrieved 200 pieces of valid data were collected. Table 2 is the statistic type table for the reading trail from the questionnaire, with the type Z trail still most common, 139 subjects, taking up 69.50%; the type X trail coming next with 26 subjects, taking up 13.00%; the type U trail has 21 subjects, taking up 10.05%; the type N trail has 14 subjects, taking up only 7.00%.

TABLE 2
STATISTIC TABLE FOR THE READING TRAIL FROM THE QUESTIONNAIRE

| Scanning Trail types | Person(s) | Percentage (%) | Remarks |
|---|---|---|---|
| Z | 139 | 69.50 | |
| N | 14 | 7.00 | Including reverse-N & upside down N |
| X | 26 | 13.00 | |
| U | 21 | 10.05 | |
| Total | 200 | 100 | |

**The Analyzation of Matching Experimental and Questionnaire Data**

After conducting the eye-movement experiment, immediately ask subjects using the interview method their reading order for these square-palindrome words, from analyzing the data from the eye-movement hot area pictures for the scanning trail, the researcher only collected the 126 valid pieces of data. The researcher then analyzed the 126 pieces of valid data and the ones from the questionnaire for one on one comparison, concluding with Table 3 statistic table for gender cross-matching from the questionnaire, discovering only 38.89% of matching percentage, meaning only 38.89% of the trails the university students read and the ones they scan with their eyes match, in other words, a high 61.11% of the university students answer differently from what they truly think. On preliminary observation, women tend to cooperate more (42.4%) more than men (37.4%). But does this mean woman really express their thoughts more honestly than men?

TABLE 3
STATISTIC TYPE TABLE FOR GENDER CROSS-MATCHING FROM THE QUESTIONNAIRE

| | | | Gender | | |
|---|---|---|---|---|---|
| | | | Male | Female | Total |
| Questionnaire answers | Matching | Count | 35 | 14 | 49 |
| | | % in total | 27.8 | 11.1 | 38.9 |
| | Non-Matching | Count | 58 | 19 | 77 |
| | | % in total | 46.0 | 15.1 | 61.1 |
| Total | | Count | 93 | 33 | 126 |
| | | % in total | 73.8 | 26.2 | 100 |

TABLE 4
CHI-SQUARE TESTING FOR GENDER FROM THE QUESTIONNAIRE

| | Value | df | Approximate. Significant (2 tails) | Precise Significant (2 tails) | Precise Significant (1 tail) |
|---|---|---|---|---|---|
| Pearson Chi-square | .235[a] | 1 | .628 | | |
| Continuing correction[b] | .077 | 1 | .782 | | |
| Approximate rate | .234 | 1 | .629 | | |
| Fisher testing | | | | .680 | .388 |
| No of valid observation | 126 | | | | |

a.0 data cell (0.0%). Estimated counts under 5. Estimated counts minimum 12.83.
b. Only for 2x2 cells to be calculated.

The *p* value had set to lower than 0.05 to question whether the gender has any connection to the subjects' attitude during the questionnaire? Null Hypothesis: the gender of the university student's questionnaire and their answer is mutually independent, compared to the Research Hypothesis: the gender of the university student and their answers are not independent. After the SSPS Fisher's chi-square 2x2 statistical testify results, there is a conclusion of Table 4 independence testify, the results show: $\chi^2$=0.235, under the circumstances of *df*=1, the value *p* (0.680) does not make the significant standards, thus needed to accept the Null Hypothesis: The gender does not have any connections to the attitude of the subject during the questionnaire, in other words, no matter the university student is male or female, only 38.89% of them express their thoughts truthfully onto the questionnaire.

**Type Distribution Statistic Testify**

Although the answers on the reading trail and the eyeball scanning trail of these university students only match 38.89%, but both show a similar distribute pattern in the types of reading orders, such as Table 5 shows, the distribute of each type has a highly close percentage, both variables are type variables, which are suitable for further chi-square test. Using chi-square percentage independence test to test whether there would is a visible difference to the reaction of university students' reading trail types in different research methods. In other words, compared the distribute between the scanning trail of the university students' eye-tracker and the reading order on their questionnaire, the researcher wanted to see the same sample performed from two self-variables (eye-movement trail and the questionnaire trail, or known as the operate variable) if there would be a similar distribute pattern in the dependent variable (trail type, or known as react variable) [12][13][14] .

TABLE 5
SCANNING TRAIL & READING TRAIL TYPES PERCENTAGE STATISTICAL TABLE

| Trail types | Eye move-ment (%) | Question-naire (%) | Remarks |
|---|---|---|---|
| Z | 54.76 | 69.50 | |
| N | 10.32 | 7.00 | Highly similar |
| X | 13.49 | 13.00 | Highly similar |
| U | 21.43 | 10.05 | |
| Total | 100 | 100 | |

When the *p* value is set lower than 0.05 hypothetically to test the Null Hypothesis: the eyeball scanning trail and questionnaire reading trail are mutually independent; compared to the Research Hypothesis: The eyeball scanning trail and questionnaire reading trail are not independent. After the SSPS statistical test results, had the conclusion of Table 6 cross distribution of scanning trail & reading trail and Table 7 independent test, the results tell us: $\chi^2$=9.943, under the circumstances of *df*=3, the value *p* (0.019) meets the visible standards, thus it is a conclusion to deny the null hypothesis and accept the research hypothesis, in other words, the different types of scanning trails and the different reading trails marked onto the questionnaire by the university students have a similar distribution pattern.

TABLE 6
CROSS DISTRIBUTION OF SCANNING TRAIL AND READING TRAIL

| | | | Research Method | | |
|---|---|---|---|---|---|
| | | | Question. | Eye-Mov. | Total |
| Reading Trail | Type Z | Count | 139 | 69 | 208 |
| | | % in total | 42.6 | 21.2 | 63.8 |
| | Type N | Count | 14 | 13 | 27 |
| | | % in total | 4.3 | 4.0 | 8.3 |
| | Type X | Count | 26 | 17 | 43 |
| | | % in total | 8.0 | 5.2 | 13.2 |
| | Type U | Count | 21 | 27 | 48 |
| | | % in total | 6.4 | 8.3 | 14.7 |
| Total | | Count | 200 | 126 | 326 |
| | | % in total | 61.3 | 38.7 | 100 |

TABLE 7
DISTRIBUTION OF SCANNING TRAIL AND READING TRAIL CHI-SQUARE INDEPENDENT TEST

| | Value | Degree of freedom (df) | Approximate significant |
|---|---|---|---|
| Pearson Chi-square | 9.943[a] | 3 | .019 |
| Approximate rate | 9.766 | 3 | .021 |
| Linier/liner correction | 8.066 | 1 | .005 |
| No of valid observation | 326 | 10.05 | |

| | | Compare measure value | Significant |
|---|---|---|---|
| Scanning Trail vs. Reading Trail | Phi | .172 | .019 |
| | Cramer's V | .712 | .019 |
| | List Coefficient | .172 | .019 |

a. 0 data cell (0.0%). Estimated counts under 5. Estimated counts minimum 12.83。

**Discussions**

In the social science field, there are two reasons to believe in the questionnaire results: if one expresses its true thoughts (denotation) in the questionnaire and the responder's opinions can represent the population opinions. The latter is discussed using the statistical view, the same goes for the study result of social science studies, thus they are not included in the discussion of this study; the former uses "negative worded test versions design" and asks people to "answer immediately" to increase the denotation of the subject, however, the negative worded test versions design will lower the effective questionnaires, and answering immediately will only work on the interview method. Even so, thanks to technology and the popularization of the eye-tracker, which is easy for researchers to access and cause no harm to the subject, to make this experiment with one hundred and so students to run smoothly.

To make both research methods start the same, only did the researcher use the interview questionnaire methods for a single topic. The experiment teaching materials for this study are based on a single comparison question as its core, to discuss whether the reaction of university students towards a questionnaire is consistent, the single question is: Do how they read the Chinese square-palindrome words in their mind and on the questionnaire match [15][16].

There are two main findings that both match at 38.89% and although the questionnaire results have only a 38.89% liability rate, the gender of the participant does not affect these two distributions. As for the distribution of both reading orders for the square shaped terms are highly similar, which means the questionnaire is still suitable to conduct statistical analyzation and descriptions on subjects, for example during this study, it is discovered that university students used the type Z reading trail (eye-movement experiment 54.76%; questionnaire 69.50%) most commonly while reading the square-palindrome words and type N (eye-movement experiment 10.32%; questionnaire 7.00%) most rarely. Thus, there are two conclusions from the study: It is the best way to choose an experimental method for the researchers of natural science if possible; if need big amounts of data to inference an issue, then it is more suitable to use a questionnaire. Even though the conclusion of the study is shock for most scholars, the researcher does insist on believing that it is necessary to use another research tool of natural science to conduct the repeat

research.

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