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Gender and Semantic Interpretation

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Abstract

The views that gender and language are related each other has been reviewed from at least two different disciplines: sociolinguistics and psychology. From the first discipline, it has been concluded that gender and language has no natural relationship for it is cultural values that shape genderlect. From the second discipline, it has been concluded that gender and language has natural relationship for different gender has different brain architecture. However, still, these views tend to focus more on the language production. Viewed from language comprehension, specified to semantic interpretation, this research involved 60 participants (30 males and 30 females) randomly taken from various affiliations with age ranged from 18-32 years old. 30 questions concerning semantic interpretation which are divided into entailment, presupposition, and basic syllogism are given. The result confirms various theories about 'gendered-brain' especially lateralization theory. This research has concluded that there is a natural relationship between gender and semantic interpretation.

Keywords: *gender, semantic interpretation, lateralization, lateral, bilateral*

1. Background

Human are the seeker of the truth and the only one creature that can do that. As human being is distinguished by various parameters – one of them is gender – human consistently seek the truth about gender, about them. Many people may not be interested in gender differences but it does not change the fact that we are, as human beings, distinguished by gender for some reasons (e.g. marriage).

In early times, gender was understood limited to biological and physical differences. As time goes by, the term gender is understood and used in wider insights including behavior, thinking style, economic and political role, and also language use. This is saying that males and females are not only different in physical appearance or biological means, but also their thinking patterns and language uses are also different. The last mentioned is the core of this research.

There are plenty of researches addressed the impact of gender differences in daily life practices especially in psychology and sociology fields. In linguistics or at least EFL field, the topic is rarely touched. A survey conducted in 2017 by Stapleton & Shao (2017) reported that the interest of EFL, ESL, and ELT researchers has focused on increasing understanding on how the second or foreign language teaching can be improved. This report, implicitly,

suggested to linguists or second and foreign language teachers (and researchers) to take a role, a jump, to investigate what can matter in our field.

Researches in sociolinguistics which addressed this issue – gender and language – had covered many areas in language production like diction, grammar, and speaking style like reported in Robson & Stockwell (2005) which pictures female in inferior level. However, it is assumed that the gender difference and its impact on the language use reported in it have more things to do with sociocultural values rather than the gender itself. What it is trying to say is that, it is the social and cultural rules that determine how someone uses language based on their gender, not because of the gender itself.

This research is different. The aim of this research is to capture whether (or not) there is a relationship between gender and semantic interpretation. Language comprehension – which should be distinguished from language reception (reading and listening) – means understanding the sentence or utterance by logical reasoning and not by intuition or habits. This research tried to make sure that gender affects (or does not affect) the way someone interpret sentences (in his/her language) validly.

Valid is more than correct. A correct interpretation can be achieved by intuition and habit (e.g. pragmatic interpretation on the utterances). To say that an interpretation is valid, there must be logical reasoning by investigating the proposition which has only two values (true and false). Logic itself is the investigation of the validity or the study of reasoning and inference. Reason or argument in interpreting sentence is the chains that must be directly connected each other for an interpretation to be valid (see Gamut, 1991:1; Riemer, 2010:174).

It is clear that semantics is the only linguistics branch that involves logic as one of its concepts. Riemer (2010:174) mentions that:

> When people first began to think systematically about meaning of language and the relation between these meanings, it was logical concepts to which they often appealed for explanation.

Logic is actually not a concept but an ability to think that is possessed by human. However, human are different based on their gender. As will be discussed later on, the brain of male and female is different and since logic has been widely known is located in the left hemisphere of the brain, it is assumed that male and female have different thinking style and therefore the gender difference may affect semantic (or logical) interpretation on sentences.

The question addressed through this research should be self-explained. To make it clearer, this research aims to answer the questions whether (or not) gender and semantic interpretation has relationship.

2. Theoretical Basis

2.1.An Overview on Gender and Language Use

Gender and language use has been one of the intriguing discussions among linguists; the term used – though controversial – for this discourse is genderlect. This term is even not registered in English vocabulary yet. However, this term is now widely used to refer to the relationship between gender and language.

The term genderlect was used firstly in the 1970s in the linguistics literature, where it refers to a language variety explained on the grounds of speaker gender/sex. However, this term

was originated just after Weinrich (in 1953) claimed that sex can be a relevant variable in language contact situations (Hidalgo-Tenario in Naples, 2016). Therefore, the basic hypothesis underlying the concept of genderlect is that gender affects language use.

Gender and language has been described in many sociolinguistics texts. However, most of the descriptions picture female-genderlect rather than to capture gender and language. Hidalgo-Tenario (in Naples, 2016) mentioned that linguistics experts have largely focused on the female genderlect as a deviation from the male norm. This, perhaps, is caused by the common sense that most societies treat male as the norm or as the parameter. In the other words, it has been seemed that masculine gender has been a parameter to rule social practices including linguistic communication. Robson & Stockwell (2005:2) mentioned that:

> Language…seems to treat masculine features as the norm and feminine features as eccentric or 'other' and language usage itself must be regarded as phallocentric, capable only of offering expression to masculinity and unavoidably denying women a public voice of their own. In this view, women are forced to use patterns of expression that are both alien and alienating.

The social fact mentioned by Robson & Stockwell above might be one of the reasons why linguistics experts tend to investigate how women speak because it is interesting to understand the 'alien and alienating' patterns of expression used or produced by female. In the other words, female genderlect is more interesting than male genderlect because male genderlect is a norm that has been widely known – male genderlect reflects 'normal' language use.

Robson & Stockwell described some of the styles of female language use which indicate the inferiority possessed by female. Here are some of the claims described by Robson & Stockwell (2005):

- Women tend to use more pause that reflects hesitancy towards what she communicates through language;
- Women tend to be less firm in delivering their thoughts through language;
- Women tend to use many inclusive pronouns (we, us) and this reflects the needs of the support or agreement towards the idea that they present in communication;
- Women tend to avoid to avoid promises or other types of taboo expressions;
- Women tend to give support to men-interlocutor in communication;
- Women tend not to interrupt the conversation especially when communicating with men.

The list of claims above can be debated by others for we can have different facts in our social environment. These claims position female in the inferior level in communication or in language contact situation. The question is, is it because they are female? Or, is it because of the sociocultural values that treat female that way?

These claims, perhaps, can be found in the society which adopts patriarchal system. We generally perceive patriarchy as a social system which gives male more authorities than female including political leadership, moral authority, social rights, and power on property. Since language is used as a medium for self-expression, then all authorities (if cannot be called egos) attached to male will be reflected through language. If this is the case, then these claims are difficult to be found or to be proven in societies where matriarchal system is adopted.

Female, socially and culturally, are bounded or not free to express themselves in communication. This pattern might have been long rooted in a society and become an element of the culture then is taught to the children within the society. It seems like this inferiority is something acquired or learned within a sociocultural environment rather than the gender. Sapir himself stated that:

> Speech is a human activity… it is a purely historical heritage of the group, the product of long-continued social usage (Sapir, 1921:4).

Sapir believed that language is a purely historical heritage which means that human acquires language from its society. Social variables such as social classes, race, ethnicity group, family income, age, job, as well as sociocultural and educational backgrounds, were already being examined as factors potentially influencing linguistic performance (Labov in Hidalgo-Tenario in Naples, 2016). By looking at the claims described by Robson & Stockwell, theory proposed by Sapir, and researches reported by Labov, it seems like the gender-based influence on the language use is not a natural phenomenon.

However, there are some researches in psychology and neuroscience that can be considered to look how gender affects language use. Helgeson (2012) discussed one of psychoanalysis perspectives that perhaps support the claims described by Robson & Stockwell (2005) above. Freud believed that the inferiority in language use or in communication possessed by female comes from envy. He believed that females find themselves different to male related to sexual instrument. This difference creates a kind of envy in female (girls) and in turn creates the feeling of inferiority. This envy, Freud argued, is not directly detectable because it resides in the subconscious mind. Females may feel the envy but they are not fully conscious about the factors. Still in Helgeson (2012), Freud's belief was criticized by another psychoanalyst named Karen Horner. For Horner, the feeling of inferiority does not come from physical envy but social environment. This statement seems to support sociolinguistic perspective toward female inferiority in communication.

Helgeson also reviewed various researches which investigated how gender affects language use. In the review, different picture of facts are presented where females are shown outperform over males. Here are some claims reviewed by Helgeson (2012) (they use girls and boys rather than females and males):

- Girls learn to speak faster than boys;
- Girls develop their vocabulary faster than boys;
- Girls are better in writing than boys;
- More boys are found to have dyslexia than girls;
- More boys are found to stutter in speaking than girls.

It is interesting to think that when they are girls their linguistic competence and performance are so promising. These claims are grounded on psychological and neurological investigations. Can we see this is natural? Let us assume that it is natural then it is also assumable that cultural values living in the patriarchal society have pressed down this ability. The fact that when they are still girls they learn language faster than boys but when they come to age they are hesitant to speak is worthy to reflect. However, it is not one of the points in this research.

There are various reasons that Helgeson mentioned but the most relevant to this research is the reason that female and male have different brain architecture. Since this research tries to capture the relationship between gender and semantic interpretation (as one of language use)

and not related to how sociocultural values play certain role, then we put a discussion about gender and brain and language below.

2.2. Brain, Gender, and Language

To be able to interpret a sentence logically or semantically someone needs to have sufficient knowledge and ability to deduce premises (syllogism), to certainly see the proposition (entailment), and/or to extract the pre-condition that makes a proposition true or false (presupposition). This knowledge is attainable by attending a semantics course. However, not all people have chance to attend semantics course and not all people have to do that. Not attending semantics course also do not have to make someone cannot interpret sentence based on a logical way. This is true because logic is not necessarily a science; logic is a function in the brain.

It has been generally known that our brain consists of several parts that operate different functions interactively. The most general parts known today for non-neuroscience speakers are the brain hemispheres. We call the hemispheres as right-brain and left-brain for they are located side by side. Our brain hemispheres are connected by a component of brain called corpus callosum (Knaap, 2010; Zefy & Cohen, 2016; Uddin, 2018). These hemispheres operate different functions and logic (and language) is one of the functions operated in the left hemispheres or left-brain. The functions of the brain hemispheres were known from the studies on the patients who had their corpus callosum severed. When someone's corpus callosum severed, the communication between the hemispheres is 'interrupted' and from that the surgeons (or researchers) can examine the functions of each hemisphere without being 'interrupted' by another hemisphere. The study which was called 'split brain research' then built a theory which is known as theory of lateralization.

Logic and language are two functions operated in the left hemisphere (Bielefeldt, 2006). In that hemisphere, two areas have been found that responsible for language processing. These two parts are called Broca's area and Wernicke's area.

Broca's area is said to be responsible for language production and Wernicke's area is said to be responsible for language comprehension (Zefy & Cohen, 2016). If logic or analytical thinking and language comprehension are processed in the left hemisphere of the brain, it can be assumed that people who utilize this hemisphere optimally have more advantages in language comprehension than people who utilize the other one more optimally. This is one of the important points in lateralization theory; that some people are good in left hemisphere and some other people are good in right hemisphere utilization. If this is the case, since logic and language comprehension are located in this hemisphere, semantic interpretation is assumed to be found more on the left-brainer rather than the right-brainer. However, it does not mean that right-brainers do not utilize their left hemisphere. What it is saying is that one of the hemispheres is more dominant than the other. The term used for people who utilize both hemispheres optimally is bilateral and for people who utilize one of the hemispheres more dominant is termed lateral.

Researchers have discovered that female and male have different brain architecture. Rogers & Rogers (2001), Zaidi (2010), Helgeson (2012), and Uddin (2018) are only four of the researchers who had reviewed and noted a long list of differences between female and male brains which were taken from tons of research reports in psychology and neuroscience field. Related to the lateralization of the brain, there is no debate in the reviewed researches above that female is bilateral and male is lateral. In simpler words, females tend to utilize both brain hemispheres and males tend to utilize one hemisphere more dominantly than the other one.

One of the clearest reasons is that females have bigger size corpus callosum than males. Since corpus callosum functions as the bridge linking the hemispheres and make the interaction between the hemispheres, then the functions in the both hemispheres are operated more optimally than in males.

The neurological facts stated above imply that some functions operated in certain brain hemispheres are not in preference for males. For example, if a man is left-brainer, he can be good in logical reasoning but he is not good enough in imagination for imagination or creativity is a function operated in the right hemisphere (Bielefeldt, 2006). Although it is not something that is necessarily to generalize, but that is one of the implications that the researches above want to tell us. Since females are bilateral, they are assumed to be balance in utilizing both hemispheres to operate various functions. However, this is not to say that one gender is better or superior than the other. What it is trying to capture that it is assumed or hypothesized that gender and semantic interpretation (logic and language comprehension) have a serious relationship.

It has been clear that language is processed in the Broca's and Wernicke's areas and both are located in the left hemisphere. However, in language use (e.g. in communication), both hemispheres are working interactively because some language-related functions (e.g. intonation or prosody) are operated in the right hemisphere. Moreover, emotion – a right hemisphere function – plays important role in generating affective implication of language. Therefore, people with bilateral brain have more advantages in language use (production and comprehension) than the lateral one. In sum, language production in most people is strongly lateralized to the left hemisphere, but language understanding is generally a bilateral activity (Cook, 2002); gender, brain, and language are in a line.

2.3. Semantic Interpretation and Logic

Interpretation can be reasonably considered as a part of comprehension. The reason is that both interpretation and comprehension result in the understanding. By interpreting a sentence, we mean to comprehend the meaning of the sentence. However, comprehension may involve more activities than merely interpreting. Comprehending oral sentences (utterances) involves the activity of listening and what we listen during comprehending is pronunciation, structure, diction, accent, and so forth. Interpretation – although it does not marginalize the other activity – is more about logical reasoning to comprehend the meaning.

There are many variables that help us to interpret a sentence including the domain of discourse and the context. However, since meaning has its types and levels, a same sentence can be interpreted variously. This happens more in oral communication than written communication. Most of the times, we tend to communicate ideas or intentions indirectly by using speech acts, implicatures, and so on. We – in this language contact situation – tend to interpret the meaning pragmatically rather than semantically. In doing so, we tend to be more intuitive rather than logical.

Semantic interpretation is logical interpretation. When we are trying to interpret a sentence semantically, we are actually doing logical reasoning to build a strong and clear foundation to support our interpretation. Since semantics itself is defined as the study of word and sentence meaning abstracted away from the context of use (Griffiths, 2006:15), then the source of the logical reasoning is the word and the sentence structure. Context seems to have no role in the semantic interpretation. From the word and the structure of the sentence, we extract the logical idea from the sentence which we know as proposition.

Proposition itself was originally a concept in the logics (as a study). Preposition has been defined as verbal assertion of conclusion (Poespoprodjo, 1991:166) or something that serves as the premise or the conclusion (Riemer, 2010:178). Today, proposition is not only a concept in logics but also in semantics.

In semantics, proposition of a sentence is described in at least three types: entailment, presupposition, and syllogism. These three types of propositional relationship must be done by the sentence (or sentences) alone. In the other words, it is an attempt to achieve valid interpretation of sentences without trying to connect with the context of use. Since logic is the study of the valid chains of reasoning (Gamut, 1991:1; Riemer, 2010:174), then semantic interpretation is a logical reasoning activity which describes that semantics and logics are closely related.

In logics tradition, logical reasoning is accomplished by using logical notations which not all people understand. This has to do with Frege, Russell, and Wittgenstein's concepts that daily words are too ambiguous to describe the proposition. For Wittgenstein (2001), picture is more accurate to describe proposition rather than words; and we can see today that logical notations are more like picture rather than words. The logical notations are also found in many semantics textbooks. However, those notations are used to test the truth value of proposition and for the sake of logical reasoning to grasp a valid interpretation (in entailment, presupposition, and syllogism) on daily sentences someone does not have to use the logical notations. Truth by language can be achieved by being rational and logical (in thinking) and not putting any intuitive attempt to interpret the sentence.

Nevertheless, being logical in interpreting sentences is a challenge because we have been habituated to interpret sentences or utterances pragmatically in our daily communication. In the other words, we comprehend communication more intuitively rather than logically. For non-linguistics people (or students), they need to be introduced to some related concepts in semantics (entailment, presupposition, and syllogism). They need to be informed and therefore they know what to do with the sentences; and not because they are not logical. For example, not all people know what presupposition means. Both entailment and presupposition are implied meaning but they have different aspect. For logical interpretation (or semantic interpretation) on sentences to occur, they need to restrict their attempt in working on the sentences.

Related to the brain functions, comprehension on daily utterances involved both hemispheres functions (Cook, 2010). However, in this case, someone needs to restrict the right hemisphere activity for logic is a function specialized in the left hemisphere. Up to this point, it is interesting that genders have 'different' brain architecture and since semantic interpretation must be related to the brain function (logic in this case), then we are going to see whether (or not) gender and semantic interpretation has relationship.

It is important to inform that sociolinguistics researches which investigated gender and language were focused on the language production. This research focuses on the language comprehension.

3. Method

3.1.Research Design

The purpose of this research is to have an insight about the relationship between gender and semantic interpretation. The participants involved in this research consist of females and

males participant. Therefore, there are two sets of data to be compared in one measurement. Hatch & Farhady (1982:27) mention that this kind of research is categorized into criterion-group design which is a sub-design under ex post facto.

3.2. Participants

Compared to other researches which investigated the relationship between gender and language, this research involved smaller numbers of participant. There are 30 males and 30 females (total 60 participants) have followed the test through two ways. The first way is the paper-based test and the second one is internet-based test. These two ways consist of the same test; the use of internet is supposed to give easiness to follow the test from different places. The participants are not chosen by the researcher. They come from various affiliations and professions. The age of the participants are ranged from 18-32 years old. However, age is not one of the investigated variables therefore it is not the case. It is important to note that the participants' names are codified to R (respondent).

3.3. Techniques of Data Collection and Data Analysis

The researcher constructed a test which consists of 30 multiple choices questions (the participants are instructed to choose the logical interpretation from the given sentences). The questions are divided into three sub-sections namely entailment, presupposition, and basic syllogism. The questions – which are constructed in Indonesian – are distributed by paper and on the website created by the researcher. The test questions are adapted from various semantics textbooks and have been validated by expert judgment.

The participants' true answers are mentioned in percentage scores. These scores are tabulated to find the means. In order to test the relationship between gender and semantic interpretation, point-biserial correlation coefficient (r_{pb}) is used. Furthermore, to see the significance of the relationship (if any), a T-test is accomplished.

r_{pb} formula:

$$r_{pb} = \frac{(\overline{Y1} - \overline{Y2}\ \sqrt{(P_{y1}P_{y2}\ )}}{SD}$$

The result is then discussed based on the theories and findings from the previous related researches. The conclusion of the research is in terms of a hypothetical test which is declared as follow:

H_1: there is a relationship between gender and semantic interpretation

H_0: there is no relationship between gender and semantic interpretation

Based on the consensus in statistics, there are three values: -1, 0, and +1. If the r_{pb} value is -1 or +1, then H_0 is rejected, whereas if the r_{pb} value is 0 then H_0 is accepted. Related to T-test result, the researcher examines the significance level of the relationship (if any). If the value of *t* is greater than the *t-table* (at .05, df 58), then the relationship is significance, vice versa.

4. Finding and Discussion

4.1. Raw Data

There are two ways to see the scores gained by the participants. Firstly, the researcher displays the scores which are sorted by participants' gender (there is an additional table functions as the summary of the data). Secondly the researcher displays the scores which are sorted by questions.

Table 1. Participant's score

No	R*n*	G	Scores (Max.30)	Percentage
1	R1	M	19	63,33
2	R2	M	9	30,00
3	R3	M	13	43,33
4	R4	M	19	63,33
5	R5	M	14	46,67
6	R6	M	11	36,67
7	R7	M	19	63,33
8	R8	M	21	70,00
9	R9	M	13	43,33
10	R10	M	14	46,67
11	R11	M	21	70,00
12	R12	M	8	26,67
13	R13	M	11	36,67
14	R14	M	12	40,00
15	R15	M	14	46,67
16	R16	M	18	60,00
17	R17	M	16	53,33
18	R18	M	15	50,00
19	R19	M	15	50,00
20	R20	M	14	46,67
21	R21	M	14	46,67
22	R22	M	13	43,33
23	R23	M	13	43,33
24	R24	M	12	40,00
25	R25	M	12	40,00
26	R26	M	12	40,00
27	R27	M	12	40,00
28	R28	M	10	33,33
29	R29	M	9	30,00
30	R30	M	9	30,00
31	R31	F	6	20,00
32	R32	F	26	86,67
33	R33	F	13	43,33
34	R34	F	24	80,00
35	R35	F	24	80,00
36	R36	F	17	56,67
37	R37	F	13	43,33

38	R38	F	21	70,00
39	R39	F	17	56,67
40	R40	F	15	50,00
41	R41	F	17	56,67
42	R42	F	6	20,00
43	R43	F	15	50,00
44	R44	F	19	63,33
45	R45	F	24	80,00
46	R46	F	16	53,33
47	R47	F	14	46,67
48	R48	F	16	53,33
49	R49	F	23	76,67
50	R50	F	16	53,33
51	R51	F	21	70,00
52	R52	F	14	46,67
53	R53	F	10	33,33
54	R54	F	13	43,33
55	R55	F	14	46,67
56	R56	F	14	46,67
57	R57	F	17	56,67
58	R58	F	14	46,67
59	R59	F	16	53,33
60	R60	F	17	56,67

Table 2. Summary of the Data

Items	**M (Y2)**	**F (Y1)**	**Total**
N	30	30	60
Σ	412	492	904
Σ^2	6020	8754	14774
Mean	13,73	16,40	15,06

Table 3. Questions' scores

No.	**Qs. Number**	**Gender Score**		**Mean**		**Percentage**	
		M	**F**	**M**	**F**	**M**	**F**
1	Q1	10	17	0,33	0,57	33,33	56,67
2	Q2	12	16	0,40	0,53	40,00	53,33
3	Q3	10	14	0,33	0,47	33,33	46,67
4	Q4	18	17	0,60	0,57	60,00	56,67
5	Q5	18	20	0,60	0,67	60,00	66,67
6	Q6	25	24	0,83	0,80	83,33	80,00
7	Q7	16	20	0,53	0,67	53,33	66,67
8	Q8	23	27	0,77	0,90	76,67	90,00
9	Q9	18	26	0,60	0,87	60,00	86,67
10	Q10	16	21	0,53	0,70	53,33	70,00
11	Q11	7	6	0,23	0,20	23,33	20,00

12	Q12	4	8	0,13	0,27	13,33	26,67
13	Q13	3	7	0,10	0,23	10,00	23,33
14	Q14	5	4	0,17	0,13	16,67	13,33
15	Q15	16	21	0,53	0,70	53,33	70,00
16	Q16	9	12	0,30	0,40	30,00	40,00
17	Q17	11	13	0,37	0,43	36,67	43,33
18	Q18	14	16	0,47	0,53	46,67	53,33
19	Q19	20	22	0,67	0,73	66,67	73,33
20	Q20	8	10	0,27	0,33	26,67	33,33
21	Q21	19	21	0,63	0,70	63,33	70,00
22	Q22	26	27	0,87	0,90	86,67	90,00
23	Q23	16	24	0,53	0,80	53,33	80,00
24	Q24	16	15	0,53	0,50	53,33	50,00
25	Q25	14	18	0,47	0,60	46,67	60,00
26	Q26	14	16	0,47	0,53	46,67	53,33
27	Q27	18	14	0,60	0,47	60,00	46,67
28	Q28	12	20	0,40	0,67	40,00	66,67
29	Q29	7	7	0,23	0,23	23,33	23,33
30	Q30	7	9	0,23	0,30	23,33	30,00

4.2.Data Analysis

Given the scores above, we can find the r_{pb} value by using the formula mentioned in the previous part. This analysis is done to see whether a relationship exists between gender and semantic interpretation. The standard deviation used is the standard deviation of population.

r_{pb}:

$$r_{pb} = \frac{(\overline{Y1} - \overline{Y2}\ \sqrt{(P_{y1}P_{y2}\ )}}{SD}$$

$$r_{pb} = \frac{(16{,}40 - 13{,}73)\ \sqrt{(0{,}55 * 0{,}46)}}{4{,}39}$$

$$r_{pb} = \frac{(2{,}67)\ (0{,}50)}{4{,}39}$$

$$r_{pb} = \frac{1{,}33}{4{,}39}$$

r_{pb} = +0,30

Since in rpb interpretation 0 means there is no relationship between variables, then the r_{pb} value shown above (> 0) rejects the H_0 hypothesis. This can be interpreted as the relationship between the variables exists (positively) although the value is relatively low.

T-test:

$$t = \frac{r}{\sqrt{(1 - r^2)/(n - 2)}}$$

$$t = \frac{0{,}30}{\sqrt{(1 - 0{,}09)/(60 - 2)}}$$

$$t = \frac{0{,}30}{\sqrt{(0{,}91)/(58)}}$$

$$t = \frac{0{,}30}{0{,}13}$$

$$t = 2{,}43$$

Given the t-value above, we can compare the 2,43 to the critical score. The researcher uses .025 in the t-table since .025 at one end and .025 at the other end gives us .05. The critical score from the t-table at .05 and *df* 58 (58 does not exist therefore 60 is used) is 2,00. Since the t-value is greater than the critical value from the t-table, then the result is significant.

Gender and language use has been noticed by linguists from many years ago. However, the linguists (and linguistics researchers) focused more on language production or linguistic performance rather than language comprehension. Moreover, researches on this topic had been more about female-genderlect (Hidalgo-Tenario, in Naples, 2016).

In most cultures, how people speak is ruled in certain way and based on some considerations. One of the relevant variables as consideration is the gender of the speaker and the hearer. Genderlect claims as pointed out by Robson & Stockwell (2005) are some of the examples about how females speak (or use language in communication). Since this claims, as discussed in the previous parts, are sociocultural based, therefore these claims are not representing natural relationship between gender and language.

Psychologically, Helgeson (2012) has worked to sum up tons of researches which investigated whether gender has natural impact on the language learning and language production. Those researches reported that gender and language do have relationship. However, since those researches also claimed the relationship from the language productive skills, then it needs to see whether gender affects the language receptive skills (understanding, reasoning, and so on). By looking at this relationship, it is possible to see the natural relationship between gender and language use.

Neuroscience has told us that language is a function operated in the brain especially in the left hemisphere (Bielefeldt, 2006). In interpreting language, other functions in various regions in the brain play their roles significantly (Cook, 2010). One of the functions (beside language) that plays important role in interpreting language is logic which is also operated in the left hemisphere of the brain. Logic itself cannot be separated from language because the validity of an interpretation on linguistic expressions relies on the valid reasoning which is the logic itself. This is the reason that logic is one of the fundamental concepts in semantics (Riemer, 2010) because logic is the study of valid chains of reasoning (Gamut, 1991; Riemer, 2010). If semantic interpretation is relevant as language use (cognitively), then it is possible to

examine the relationship between gender and language from this point of view. Therefore, this research is about gender and semantic interpretation.

Discussions in the previous parts leaded us to information that females and males have different brain architecture. The brain of males and females respond or operate the same functions differently. Rogers & Rogers (2001), Zaidi (2010), Helgeson (2012), and Uddin (2018) are only some of the researchers who have presented tons of researches in this topic. From these researches (and the researches within each of theirs), there is no debate that female utilize different brain hemispheres equally (bilateral) and male tends to utilize certain hemisphere more optimally than the other (lateral). The most grounded fact which makes no debate among the researchers is that females have respectively bigger size of corpus callosum (an organ which links the right and the left hemisphere of the brain) than males. Given this fact, it is hypothesized that gender and semantic interpretation have relationship (H_1).

Statistical analysis on the data gathered from 30 females and 30 males above confirms this by rejecting H_0 hypothesis. Moreover, further analysis by using t-test concludes that the result is significant. This result confirms that gender and semantic interpretation do have natural relationship.

The data displayed in the table 3 shows that there is a pattern that both genders have low scores in some (and same) questions in each parts. Although it seems like females outperform in most questions, it does not suggest that females participants are 'better' or 'smarter' than the males participants. The pattern is reflecting that their 'gendered-brain' correspond their work on the questions. Those questions are found more difficult than the others and this apply to both genders. At the same time, this shows that the result of the data is not by chance.

Table 3 contains their scores sorted by questions numbers. These questions are divided into three semantic classes namely entailment, presupposition, and basic syllogism. Working on this table can be summed up as follow:

Table 4. Genders scores based on semantic class

Semantic Class	**M**	**F**
Entailment	55,33	67,33
Presupposition	32,33	39,67
Basic Syllogism	49,67	57,00

The scores are the average of the accumulated percentage achieved by each gender in each semantic class. These scores seem to advantage female than male but to say that female is more logical than male can be misrepresentative. Since male is lateral (tends to utilize certain hemisphere more dominantly than the other), then it is important to be aware that most of the males involved in this research are right-brainers. Since this research applies random sampling, the dominant hemisphere of the participants is not examined. Therefore, the lateralization experienced by males can be a reason that they would not shift from one hemispheric function to other hemispheric function as easy as females would do.

If the males are right-brainer, they tend to interpret the sentence intuitively rather than logically for logic is located and operated in the left hemisphere. This has something to do with the fact that females are bilateral and this has nothing to do with this research. However, it must be a reasonable recommendation that the next researchers may consider different sampling technique.

5. Conclusion

The discussion on the theories and data has leaded us to conclude that gender and semantic interpretation has relationship and the relationship is respectively significant. Whereas the previous researches concerning gender and language focused more on the language production, this current research tends to see how gender relates to language comprehension. Since genders have different brain architecture, different gender tends to operate language differently especially in the cognitive aspect. Lateralization theory concerning gender difference in the brain is confirmed. The data seems to reflect that females outperform the task over the males but it is not necessarily the case for there is an issue rose that the males participants are right-brainers and logic-language are functions in the left brain.

Since this research applies random sampling, the dominant hemisphere of the participants is not examined. It is recommended that the next researcher who is interested to discover more understanding on this topic should consider applying different sampling techniques where purposive sampling is more preferred.

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