

MULTIMODAL VOCABULARY LEARNING THROUGH *MANGA*
IN JAPANESE AS A WORLD LANGUAGE

by

Atsuko Suga Borgmann

A Dissertation Submitted in
Partial Fulfillment of the
Requirements for the Degree of

Doctor of Philosophy
in Urban Education

at

The University of Wisconsin-Milwaukee

December 2023

ABSTRACT

MULTIMODAL VOCABULARY LEARNING THROUGH *MANGA* IN JAPANESE AS A WORLD LANGUAGE

by

Atsuko Suga Borgmann

The University of Wisconsin-Milwaukee, 2023
Under the Supervision of Professor Candance Doerr-Stevens

This study investigates the effect of *manga*, a form of Japanese comic strip, on vocabulary learning among college-level Japanese as a world language (JWL) learners. Vocabulary acquisition through reading in the context of world language education has been researched widely, but less attention has been devoted to multimodal literature with image and text such as *manga*. This research examines how *manga*'s multimodality affects learners' context building, inference for unknown words and how manga affects retaining vocabulary. The study raises three research questions. First, to what extent does *manga* influence one's ability to infer the meaning of unknown words compared to the text with English glossary? Second, to what extent does *manga* influence the speed at which one can infer meanings of unknown words compared to the text with English glossary? Lastly, to what extent does *manga* affect the retention of vocabulary over two weeks as compared to the text with English glossary? To answer these research questions, a two-period, two-sequence crossover design was used. Students participated from two university Japanese courses. Forty-two participants completed the task for the first two research questions, and 30 participants completed the task for the final research question. Participants were randomly assigned into two groups: *manga* reading in week 1 and text reading with English glossary in week 2, and text reading with English glossary in week 1 and *manga* reading in week 2. The statistical analysis was conducted through a repeated-measure t-test for

research question 1, a Wilcoxon Signed Rank Test for research question 2, and a two-way repeated measures ANOVA, an ANCOVA and t-tests for research question 3.

Results suggested that *manga* was effective for inferring unknown vocabulary, and the inference was supported by *manga*'s multimodality. The times participants spent reading two different texts did not differ significantly. The two-way repeated measures ANOVA indicated an interaction between the text type and the time passing. A general linear model test with repeated measures on different text types indicated that there was a significant difference in mean inference score, but there was no significant difference in mean retention score between the two different text types. However, follow-up t-tests indicated that there was a significant increase in score from pretest to retention through *manga* reading only. These results could be due to a small number of participants (statistical power is too low), and therefore, it is concluded that the text types did not affect their retention significantly. In addition, the results revealed that the vocabulary score between the vocabulary inference score and the retention through *manga* was significantly decreased, meaning that *manga*'s effect on inference was lost over two weeks. This suggests *manga*'s advantage in initial inference using context, and it is necessary to engage in repetition and other output activities to maintain the effect.

© Copyright by Atsuko Suga Borgmann, 2023
All Rights Reserved

Dedication

Dedicated to my family, whose unwavering support empowered me to follow my aspirations.

TABLE OF CONTENTS

LIST OF FIGURES	ix
LIST OF TABLES.....	xi
LIST OF KEY TERMS.....	xiv
LIST OF APPENDICES	xv
ACKNOWLEDGEMENTS	xvi
1. INTRODUCTION.....	1
1.1 Short History of World Language Education in the US	1
1.2 Importance of language learning	5
1.3 Japanese Language Education in the US.....	7
1.4 Unique Challenges of the Japanese Language	9
1.5 The Current Status of World Language Education.....	12
1.6 <i>Manga</i> and Graphic Novels in Language Classrooms	15
1.7 Vocabulary Acquisition in World Language Education.....	16
2. LITERATURE REVIEW.....	19
2.1 Multimodality and <i>Manga</i>	19
2.1.1 What is Multimodality?	19
2.1.2 Mode	21
2.1.3 Brief History of <i>Manga</i>	22
2.1.4 Context Building Feature of <i>Manga</i>	26
2.1.5 Systemic Functional Linguistics and Context of Language	28
2.1.6 Text and Context	29
2.2 Multimodality and Input Hypothesis.....	32
2.2.1 Context and the Input Hypothesis	32
2.2.2 Noticing Theory and Learning Vocabulary	35
2.3 Retaining Vocabulary	37
2.3.1 Dual Coding Theory.....	37
2.3.2 Involvement Load Theory	40
2.4 Vocabulary Learning.....	44
2.4.1 Historical Shift of Language Teaching Approach and Vocabulary Teaching	44
2.4.2 Vocabulary Learning Studies and Multimodal Resources	45
2.5 <i>Manga</i> as an Educational Resource	48
2.5.1 Impact of GN and <i>Manga</i> on Learning in Secondary Education	50
2.6 Summary of Chapter 2	54
2.7 Theoretical Framework and Study Design	56

3. METHODOLOGY	58
3.1 Research Questions	58
3.2 Hypotheses	58
3.3 The Participants.....	59
3.3.1 A Priori Power Analysis.....	63
3.3.2 Proficiency Level of Participants	65
3.3.3 Age of Participants	66
3.3.4 Participants' Mother Language	66
3.4 Instruments and procedures	67
3.4.1 Data Collection	67
3.4.2 Assessment and Intervention for RQ1.....	78
3.4.3 Scoring Procedures and Analysis for RQ2.....	80
3.4.4 Data Collection Procedure for RQ3.....	81
3.4.5 Scoring Procedures and Analysis for Research Question 3	82
3.5 Analysis and Measurement.....	82
4. RESULTS.....	84
4.1 Pretests.....	84
4.2 Results for Research Question 1	85
4.3 Results for Research Question 2	88
4.3.1 Removing Outliers.....	88
4.3.2 Assumption Testing for Research Question 2 Results.....	88
4.4 Results for Research Question 3	90
4.4.1 Assumption Testing for Research Question 3	90
4.4.2 Assumption Testing for Normality	91
4.4.3 Test of Sphericity.....	92
4.4.4 Interaction Between Text Type and Time	92
4.4.5 Simple Main Effects of Text Type.....	95
4.4.6 Comparison of Time: Inference test and Retention test	98
4.4.7 Vocabulary Score Differences: Pretest, Inference, and Retention Test	101
4.5 Summary of Chapter 4	104
5. DISCUSSION.....	106
5.1. Discussion for Research Question 1	106
5.1.1 Participants' inference of unknown words through <i>manga</i> vs. English glossary.....	106
5.1.2 Motivational Factor.....	112
5.1.3 Order of Exposure to Different Types of Text.....	112
5.2 Discussion for Research Question 2	113
5.2.1 Time Spent in Inferring Vocabulary	113
5.3 Discussion for Results for Research Question 3.....	114
5.3.1 Vocabulary Retention Test	114
5.4 Significance of the Study.....	117
5.5 Limitations.....	119
5.5.1 Participant Related	119

5.5.2 Methods Related	120
5.5.3 Manga Related	121
5.6 Pedagogical Implication.....	122
5.6.1 Importance of Inference	123
5.6.3 Importance of Output	126
5.7 Future Study	127
6. CONCLUSION.....	129
6.1. Summary of Findings.....	131
6.1.1 First Research Question: Vocabulary Inference Through Texts	131
6.1.2 Second Research Question: Time Spent Inferring Unknown Words	134
6.1.3 Third Research Question: Retaining Vocabulary After Two Weeks.....	135
6.2 Conclusion	136
7. REFERENCES.....	140
APPENDIX A.....	154
APPENDIX B.....	160
APPENDIX C.....	166
APPENDIX D	168
APPENDIX E.....	189
APPENDIX F.....	255
APPENDIX G	286
APPENDIX H	303

LIST OF FIGURES

Figure #	Figure title	Page #
Figure 1.1	Number of Learners from “Survey Report on Japanese-Language Education Abroad 2018” by the Japan Foundation	8
Figure 2.1	<i>Chojugiga</i>	23
Figure 2.2	<i>Ikkyu Gaikotsu</i>	24
Figure 2.3	<i>Hokusai Manga</i>	25
Figure 2.4	Example of <i>Manga</i> ’s Grammar	26
Figure 2.5	Structure Model of Dual Coding Theory	36
Figure 3.1	Product of the Study Design	67
Figure 3.2	Example of a <i>Manga</i> Text	74
Figure 3.3	Example of a Glossary Text	75
Figure 3.4	Example of Feedback	77
Figure 3.5	Sample of Vocabulary Retention Test	80
Figure 4.1	Individual Vocabulary Scores: Pretest and Inference Performance	85
Figure 4.2	Related-Samples Wilcoxon Signed Rank Test	86
Figure 4.3	Profile Plot for Interaction of Text Types and Time	91
Figure 4.4	Individual Vocabulary Scores: Pretest, Inference, Retention Performance	101
Figure 5.1	<i>Manga</i> Text Example	106
Figure 5.2	Text with English Glossary	106
Figure 5.3	<i>Manga</i> Text Sample	112
Figure 5.4	Text with Glossary Sample	112
Figure B1	A priori Power Analysis for Research Question 1	Appendix B
Figure B2	A priori Power Analysis for Research Question 2	Appendix B
Figure B3	A priori Power Analysis for Research Question 3	Appendix B
Figure F1	Boxplot of Difference for Vocabulary Inference Score through <i>Manga</i> and through Glossary	Appendix F
Figure F2	Boxplot for Week 1 Time Spent Detecting Outliers	Appendix F
Figure F3	Boxplot for Time Suspected Outliers for Week 2: Time (Minutes)	Appendix F
Figure F4	Histogram for Time Distribution for <i>Manga</i>	Appendix F
Figure F5	Histogram for Time Distribution for Glossary	Appendix F
Figure F6	Continuous Field Information: Time Spent Through <i>Manga</i>	Appendix F
Figure F7	Continuous Field Information: Time Spent Through Glossary	Appendix F
Figure F8	Boxplot for <i>Manga</i> Inference Score	Appendix F
Figure F9	Boxplot for <i>Manga</i> Retention Score	Appendix F
Figure F10	Boxplot for Glossary Inference Score	Appendix F
Figure F11	Boxplot for Glossary Retention Score	Appendix F

Figure F12	Detecting Outliers for t-test of Pretest and Inference Score through <i>Manga</i> Text	Appendix F
Figure F13	Detecting Outliers for t-test of Pretest and Inference Score through Glossary Text	Appendix F
Figure F14	Detecting Outliers for t-test of Pretest and Retention Score through <i>Manga</i> Text	Appendix F
Figure F15	Detecting Outliers for t-test of Pretest and Retention Score through Glossary text	Appendix F

LIST OF TABLES

Table #	Table title	Page #
Table 3.1	Data Collection Schedule and Number of Participants	60
Table 3.2	Demographic characteristics of participants	66
Table 3.3	List of Vocabulary Used in the Study	71
Table 4.2	Vocabulary Inference Paired Samples Test	84
Table 4.3	Vocabulary Inference Paired Samples Effect Sizes	84
Table 4.4	Wilcoxon Signed Rank Test: Hypothesis Test Summary	87
Table 4.5	Related-Samples Wilcoxon Signed Rank Test Summary	87
Table 4.6	Cells of the Design	88
Table 4.7	Tests of Within-Subjects Effects: Interaction of Text Types and Time	92
Table 4.8	Tests of Within-Subjects Effect: Inference Vocabulary Score for Text Types	93
Table 4.9	Pairwise Comparisons: Inference Vocabulary Score for Text Types	94
Table 4.10	Comparison of the Vocabulary Retention Score: <i>Manga</i> and Glossary	94
Table 4.11	Pairwise Comparisons: Retention Vocabulary Score for Text Types	95
Table 4.12	Tests of Within-Subjects Effects: <i>manga</i>	
Table 4.13	Pairwise Comparisons: <i>manga</i>	96
Table 4.14	Tests of Within-Subjects Effects: Glossary	97
Table 4.15	Pairwise Comparisons: Glossary	97
Table 4.16	Descriptive Statistics for Paired Samples Statistics from pretest to inference and retention tests	99
Table 4.17	Paired Samples t-test	100
Table B1	Words that Appeared in Pretest 1 & Pretest 2	Appendix B
Table B2	Words that Appeared in the Study	Appendix B
Table D1	Week 1 Day 1 Question 1 & 2 Acceptable and Unacceptable Answers	Appendix D
Table D2	Week 1 Day 1 Question 3 & 4 Acceptable and Unacceptable Answers	Appendix D
Table D3	Week 1 Day 1 Question 5 & 6 Acceptable and Unacceptable Answers	Appendix D
Table D4	Week 1 Day 1 Question 7 & 8 Acceptable and Unacceptable Answers	Appendix D
Table D5	Week 1 Day 2 Question 1 & 2 Acceptable and Unacceptable Answers	Appendix D
Table D6	Week 1 Day 2 Question 3 & 4 Acceptable and Unacceptable Answers	Appendix D
Table D7	Week 1 Day 2 Question 5 & 6 Acceptable and Unacceptable Answers	Appendix D

Table D8	Week 1 Day 2 Question 7 & 8 Acceptable and Unacceptable Answers	Appendix D
Table D9	Week 1 Day 3 Question 1 & 2 Acceptable and Unacceptable Answers	Appendix D
Table D10	Week 1 Day 3 Question 3 & 4 Acceptable and Unacceptable Answers	Appendix D
Table D11	Week 1 Day 3 Question 5 & 6 Acceptable and Unacceptable Answers	Appendix D
Table D12	Week 1 Day 3 Question 7 & 8 Acceptable and Unacceptable Answers	Appendix D
Table D13	Week 1 Day 4 Question 1 & 2 Acceptable and Unacceptable Answers	Appendix D
Table D14	Week 1 Day 4 Question 3 & 4 Acceptable and Unacceptable Answers	Appendix D
Table D15	Week 1 Day 4 Question 5 & 6 Acceptable and Unacceptable Answers	Appendix D
Table D16	Week 1 Day 4 Question 7 & 8 Acceptable and Unacceptable Answers	Appendix D
Table D17	Week 2 Day 1 Question 1 & 2 Acceptable and Unacceptable Answers	Appendix D
Table D18	Week 2 Day 1 Question 3 & 4 Acceptable and Unacceptable Answers	Appendix D
Table D19	Week 2 Day 1 Question 5 & 6 Acceptable and Unacceptable Answers	Appendix D
Table D20	Week 2 Day 1 Question 7 & 8 Acceptable and Unacceptable Answers	Appendix D
Table D21	Week 2 Day 2 Question 1 & 2 Acceptable and Unacceptable Answers	Appendix D
Table D22	Week 2 Day 2 Question 3 & 4 Acceptable and Unacceptable Answers	Appendix D
Table D23	Week 2 Day 2 Question 5 & 6 Acceptable and Unacceptable Answers	Appendix D
Table D24	Week 2 Day 2 Question 7 & 8 Acceptable and Unacceptable Answers	Appendix D
Table D25	Week 2 Day 3 Question 1 & 2 Acceptable and Unacceptable Answers	Appendix D
Table D26	Week 2 Day 3 Question 3 & 4 Acceptable and Unacceptable Answers	Appendix D
Table D27	Week 2 Day 3 Question 5 & 6 Acceptable and Unacceptable Answers	Appendix D
Table D28	Week 2 Day 3 Question 7 & 8 Acceptable and Unacceptable Answers	Appendix D
Table D29	Week 2 Day 4 Question 1 & 2 Acceptable and Unacceptable Answers	Appendix D
Table D30	Week 2 Day 4 Question 3 & 4 Acceptable and Unacceptable Answers	Appendix D

Table D31	Week 2 Day 4 Question 5 & 6 Acceptable and Unacceptable Answers	Appendix D
Table D32	Week 2 Day 4 Question 7 & 8 Acceptable and Unacceptable Answers	Appendix D
Table F1	Descriptive Statistics for Pretest Score	Appendix F
Table F2	Paired Samples Test	Appendix F
Table F3	Pretest Paired Samples Effect Sizes	Appendix F
Table F4	Descriptive Statistics for Vocabulary score through <i>Manga</i> and Glossary	Appendix F
Table F5	Vocabulary Inference Tests of Normality	Appendix F
Table F6	Time Suspected Outliers for Week 1: Time (Minutes)	Appendix F
Table F7	Time Suspected Outliers for Week 2: Time (Minutes)	Appendix F
Table F8	Descriptive Statistics for Time Spent	Appendix F
Table F9	Tests of Normality for Time Spent Reading <i>Manga</i>	Appendix F
Table F10	Tests of Normality for time spent reading with English Glossary	Appendix F
Table F11	Case Processing Summary	Appendix F
Table F12	Within-Subjects Factors	Appendix F
Table F13	Descriptive Statistics for Research Question 3	Appendix F
Table F14	Detecting Outliers for Research Question 3	Appendix F
Table F15	Assumption Testing for RQ3: Case Processing Summary	Appendix F
Table F16	Descriptives for Residuals	Appendix F
Table F17	Tests of Normality	Appendix F
Table F18	Descriptives for the Difference of Pretest and Inference Score through <i>Manga</i> Text	Appendix F
Table F19	Tests of Normality for Difference between Pretest and Inference for <i>Manga</i> Text	Appendix F
Table F20	Descriptives for the Difference of Pretest and Inference Score through Glossary Text	Appendix F
Table F21	Tests of Normality for the Difference of Pretest and Inference Score through Glossary Text	Appendix F
Table F22	Descriptives for the Difference of Pretest and Retention Score through <i>Manga</i> Text	Appendix F
Table F23	Tests of Normality for the Difference of Pretest and Retention Score through <i>Manga</i> Text	Appendix F
Table F24	Descriptives for the Difference of Pretest and Retention Score through Glossary Text	Appendix F
Table F25	Tests of Normality for the Difference of Pretest and Retention Score through Glossary Text	Appendix F
Table F26	Tests of Within-Subjects Effects: Interaction of Text Types and Time with Pretest Score as Covariates	Appendix F

LIST OF KEY TERMS

Key Words: *manga*, vocabulary, Japanese as a world language, multimodality, systemic functional linguistics, inference, context, world language education, graphic novels, vocabulary learning through reading

Definition of Key Terms

- **Cognates:** words with common origins
- **Extensive reading:** a language learning approach where learners read a large amount of text for pleasure
- **Graphic novels:** stories in comic-strip format (used in this presentation for comparison purposes only; Western style as compared to Japanese style)
- **Inflection:** Verb inflection indicates the change in verb ending
- **Incidental learning:** learning that occurs as a by-product of classroom teaching; here, vocabulary learning through reading
- **Intensive reading:** a language learning approach where learners engage with a text through in-depth reading
- **JWL:** Japanese as a world language
- **Kanji:** Chinese characters that are used in modern Japanese texts
- **Manga:** a style of Japanese comic books and graphic novels characterized by diverse themes.
- **Multimodal:** a combination of different modes such as visual and auditory modes
- **Onomatopoeia:** words that describe sounds, and how things look and feel
- **Register:** formality scale in language; level of formality
- **Semiotic resources:** elements like words, images, gestures, and sounds that hold some meaning within various language activities
- **SF-MDA:** Systemic Functional Approaches to Multimodal Discourse Analysis
- **SFL:** Systemic Functional Linguistics

LIST OF APPENDICES

- Appendix A. Consent Form
- Appendix B. Tables and Figures (Methodology)
- Appendix C. Survey Prior to Data Collection
- Appendix D. Grading Criteria
- Appendix E. Reading Texts for Week 1 and Week 2
- Appendix F. Tables and Figures (Results)
- Appendix G. Vocabulary Pretest
- Appendix H. Two-Week Delay Post-Reading Assessment for Week 3 and Week 4

ACKNOWLEDGEMENTS

I had dreamed of writing the acknowledgement of my dissertation for many years. I cannot believe that time is here, and I am finally writing this page. This journey was like a first attempt at a full marathon that I had no idea how to finish. I sometimes doubted myself and whether I could truly cross the finish line. Without the people mentioned in these pages, I would not have been able to write this nor complete my degree. The roads were rugged, I was lost at times, and the steep hills challenged me. As I write this acknowledgement, Thanksgiving is around the corner. It is the perfect time for me to think about those who supported me and to send a heartfelt thank you to each and every one of them.

I could not have undertaken this journey without Dr. Candance Doerr-Stevens, my major advisor at the University of Wisconsin-Milwaukee. I am thankful for your guidance and support right from the very beginning. Your invaluable patience, feedback and trust in me kept me going even when I felt I could not go any further. Your “air” hugs always gave me courage to continue my journey. To Dr. Susie Lamborn, my committee member at the University of Wisconsin-Milwaukee, I am extremely grateful to you for generously providing me with your knowledge and expertise in the quantitative method. You also generously supervised an independent study for me. I would not have survived without your support. To Dr. Raquel Oxford, Region 9 Education Service Center, my committee member who supported my crazy idea to go back to school even after my mid-career had passed, you will forever have my gratitude. After we talked, you reassured me that my idea may not be so crazy after all, and with your words of encouragement, I was able to come this far. And last not but least, Dr. Marie Sandy, my committee member at the University of Wisconsin-Milwaukee, your first-hand experiences with the Japanese language, culture and *manga* gave very important and in-depth views into my study.

I enjoyed our little chats after class and had fun talking about the youth culture in Japan. With all the help from these amazing professors, I was able to cross that finish line.

This endeavor would not have been possible without Kelly Wang, the wonderful artist who drew all the *manga* for me. I fell in love with your drawings from the moment you finished your final project for Japanese class. You drew perfect protagonist and other casts of characters, and you gave life to this project. My gratitude also goes to Manni Amoah, who so very carefully inserted my text into all the appropriate balloons.

My heartfelt appreciation also goes to Professor Beverly Bossler, Chair of East Asian Studies at Brown University, and a wonderful supporter who truly cared about me finishing my dissertation. Our morning check-ins did wonders to help me concentrate on my writing. You generously offered me your valuable and vital feedback on my writing despite your incredibly busy schedule, and for that, I thank you immensely.

I would like to thank Dr. Timothy E. Moore for UConn's Statistical Consulting Services and for your personal assistance with my statistical analyses. Your expertise and suggestions solidified my study. You answered my many questions without fail and your explanations deepened my understanding of statistics.

My special thanks also go to Dr. Linda Clark of Brown University, who took her time out of busy schedule to give me important advice for the initial design of the study and its results. Your advice made such a difference to me. I am also thankful to Amy Cinar, whose advice was very beneficial in helping me understand statistics on a more personal level. I would like to show my

appreciation to Suna Paek, a research assistant in the Consulting Office for Research and Evaluation at the University of Wisconsin-Milwaukee, for her advice in statistics.

Many thanks to my current and former colleagues: Sachiko Hiramatsu, Yuko Kojima, Masako Lackey, Naemi McPherson, and Shinji Takahashi for supporting and announcing my study when I needed to recruit students.

I would like to extend my sincerest thanks to Anjali Patel and Alex Schmidt, for your moral support and encouragement. I am fortunate to call you my friends all these 30 years.

Thanks should also go to my former classmate and colleague, Dr. Xiaorong Wang for your encouragement and moral support. Thank you to my dear friend *Shima chan*, who from the start has always given me the warmest of encouragements. We haven't changed since our first day of high school. Thank you also to Angie, who has always been by my side, supporting and encouraging me at every milestone in my life.

I am also thankful to my Dissertation Basecamp peers for being my writing mates and for being so supportive and encouraging. The quality time we spent writing was precious to me.

I would like to acknowledge the Writing Center at UWM. Janelle and Kristine gave me so many insightful suggestions for my writing.

I would like to extend my sincerest thanks to all the participants who gave me their time and participated in my study. I hope someday I will be able to produce research that helps world language learners learn additional languages efficiently.

Lastly, I would like to express my sincerest gratitude to my family. To my husband, Karl, you were cheering for me at every corner. Even at times when I felt low and thought I could not go on, you never doubted that I would not finish. You are my pacemaker that I can always depend on, and I thank you from the bottom of my heart. Thank you for trusting me and for helping me complete this journey. To my son, Toyo, for helping me while you are on a long journey of your own. Thank you for cheering for me on throughout my climb. I am your biggest fan and I'll be cheering for your journey no matter what route you take. To my son, Takumi, who was still so young when I started this challenge. Thank you for understanding what I have been pursuing and for cheering for me while you are still discovering your own path. You have such a big heart and I know you will achieve your goals no matter what. And to our dog, Ai, you gave me such love and the best hugs of encouragement. I promise that I'll explore our neighborhood with you more often from now on. To my family in Japan, those still with me and those who have moved on—thank you for understanding my dream and for encouraging me to pursue it.

1. INTRODUCTION

In North America, the popularity of Japanese *anime* and *manga* has grown. They are very much unique forms of Japanese culture and many learners who consume this multimodal content outside the classroom also possess high proficiency levels of the Japanese language. Besides their strong motivating force, there may be some other reasons why multimodal content impacts proficiency. This study aims to explore vocabulary acquisition through incidental *manga* reading as multimodal content. Specifically, it focuses on college learners' inference of unknown words through *manga* and illustrates how it impacts their vocabulary acquisition of Japanese as a world language.

1.1 Short History of World Language Education in the US

The US is said to be a monolingual nation. Since the time of major immigrant influx to the US, people from various backgrounds had to gain English proficiency if they wanted to be employed. The English monolingual ideology became a natural state for the nation; however, it created an ideology where language diversity is a problem (Wiley, 1999). In addition, the recent focus on the STEM fields has lowered the appeal of humanities and language studies as optional fields of study. In this diversified society, understanding a different language creates sensitivity to other cultures, which is crucial for society. The American Council on the Teaching of Foreign Languages (ACTFL) states that the United States should educate all students to be able to successfully communicate to the best of their linguistic and communicative abilities in this diverse society, and all students should have equal access to world language education (NS-FLEP, 2015). Further, world language courses should be treated the same as other core subjects (NS-FLEP, 2015). In reality, however, education has always been influenced by a countries' economic and political interests. Language education in the US is no different and has been

heavily influenced by politics even though some theorists claim language and cultural issues are disconnected from sociopolitical issues (Wiley, 1999). The US was once a polyglot country with an influx of immigrants, and it is estimated that over a third of all Americans spoke a language other than English at the time of independence (Rumbaut & Massey, 2014). Kloss (1977, 1978) stated that linguistic assimilation to English occurred among European immigrant groups as these individuals felt that the US could provide them with superior opportunities as compared to their home countries (as cited in Wiley, 1999, p. 21). Leibowitz (1971) stated that an English-only policy was imposed on immigrants such as Germans, Japanese, Chinese, Native Americans, Mexicans and Puerto Ricans (as cited in Wiley, 1999, p. 25). Schmidt (1995) claimed that language was used to discriminate against immigrants for the purposes of voting and even working (as cited in Wiley, p. 25). Immigrants had to master English, with proper accent, as soon as possible to gain jobs with higher wages. Speaking the same language represented assimilation, patriotism, and pride in being American (Wiley. 1999). In this way, the early US was known for having immigrants with diverse origins, and yet, it required one ideology as Americans (Desmond, 2012). The Americanization process influenced the outlook of the country's language education for immigrant children. Immigrants who entered the country were encouraged to have only one language (English, of course) and to form a US national identity rather than celebrate the plurality of language, religion, or culture. This caused the US to develop as a monolingual nation despite commonly heard nicknames, "the melting pot" or "the salad bowl" (Desmond, 2012, p.2). Poor academic performance among many child immigrants was the result of an unfamiliarity with the English language and American culture. This formed the basis of non-scientific racism (Desmond, 2012). Language education for immigrant children is thus a "deficit"

model and “linguistic minority students had a ‘handicap’ to be overcome, a problem to be remedied” (Salomone, R., 2010, p. 8).

This ideology is still reflected in current world language and bilingual education in the US. Even though ACTFL advocates that all students should have equal access to world language education, languages are still not a part of the core curriculum of most schools; they are but electives at both the secondary and post-secondary levels. This means that the majority of the general public in the US has never taken any type of world language class during their entire education. For this reason, many US students who start learning Japanese have no experience with any type of world language study. Ortega (1999) has observed that non-native speakers are pressured to develop native-like academic skills in English in a short period of time at the expense of their first language development, while monolingual English speakers are only moderately encouraged to study a world language. Even then, there is no expectation that they become anywhere near fluent in the second language. When a language is perceived as a means to gain greater social status, economic strength or increased political power, there is a tendency towards adopting the language as the major language (Baker, 2011; Byram & Wagner, 2018a). This contradicts the premise of equal opportunity in education for all students. Each should have access to the world language education of their choice in order to become global citizens of a diverse society.

Along with a crisis of identity, in the not-so-distant past it was also believed that teaching children two or more languages at the same time affected brain development negatively. However, many empirical studies have proven that bilingual children can manipulate two languages without interfering in the development of the first language (Baker, 2011). It was previously assumed that children would wind up confused and their intellectual development

would be delayed, or even worse, harmed. IQ testing later proved that bilinguals did not differ from monolinguals in their non-verbal IQs, and in fact, it was a parents' socioeconomic status that could affect children's IQ (Jones, 1959; as cited in Baker, 2011).

As described above, mastery of the English language was at the center of creating a national ideology that was core to the US's global economic growth and diplomacy for several decades. As a result, a lack of emphasis on language education has ensured that, according to the US Census Bureau in 2015, nearly 80% of the US population was monolingual and speaks only English at home. This leaves a mere 20% of the US population able to speak an additional language, and even fewer able to speak three or more languages. To make matters worse, after increased concerns were raised in 2008 that the US educational system was not preparing students well enough to enter the fields of science, technology, engineering, and mathematics (STEM), the U.S. Department of Education announced its strong commitment to fortifying STEM education (Kuenzi, 2008; U.S. Department of Education). Students who had STEM degrees were considered more valuable to the job market than liberal arts majors, let alone language majors. This further drove the US to relegate language learning to the status of mere elective subjects. And since these language courses were often not considered to be a part of the core curriculum, fewer students felt the need to study languages at all. US education fell further behind European and Asian nations' world language education.

For these reasons, the majority of students who start studying Japanese in college, such study is their first experience with learning an additional language. For many Japanese learners, this serves as their initial exposure, and they might not be familiar with language learning strategies or the experience of acquiring an additional language.

1.2 Importance of language learning

Although world language education has been regarded as a less important elective subject in the US for a number of decades, it has recently gathered national interest. Some are now promoting language education (American Academy of Arts & Sciences, 2017), and there is a movement to remedy the decades-long disinterest and to promote language learning globally.

There are many benefits to language learning. Language learning fosters a compassion toward other languages and cultures and expands one's humanity by broadening one's view of the world. This creates a flexibility toward others that is lost when the focus is turned inward. Understanding different languages and cultures is important in this ever-changing global era. Ignorance and indifference toward other cultures cause tension both locally and globally.

Five international academies: the British Academy, the American Academy of Arts and Sciences, the Australian Academy of the Humanities, the Academy of the Social Sciences in Australia and the Royal Society of Canada have jointly released a statement announcing their support and investment in language education for the first time in history in 2017. They state:

Language skills foster literacy, educational attainment, and a confident mindset that views cultural difference with curiosity rather than prejudice. They enhance employability, enabling people to navigate multicultural environments and to be sensitive to cultural difference and better at conceiving events from multiple points of view. They encourage us to be flexible, adaptable, and globally mobile, whether as citizens or as researchers working in pursuit of new knowledge that cannot be bounded by geography. Students from every socioeconomic background must have equal access to language education to reach their full potential in the 21st century.

This statement strikes a chord. If students have an equal opportunity to learn one or more world languages during their secondary education, more of the US population could potentially benefit by expanding their literacy skills to multiple languages as well as English. This would make more students receptive to information about other languages and by extension, to other

cultures. When the COVID-19 pandemic occurred, if much of the US had had literacy in different languages, they might have been open to gathering information from multiple sources, developed deeper insights, understood more well-rounded information, and selected what could be argued as more trustworthy news. We may never know but it might have saved more people's lives.

Most of the US population is still unsure of the value of learning another language. That means many Americans do not know the challenges that language learners face nor what it is like to be forced to function in a new language. The PEW Research Center cited a 2017 report from the American Councils for International Education that 20% of US K-12 students are learning a foreign language as compared to the European median of 92% (American Councils for International Education, 2017). This means that 80% of students, during their compulsory education in the US, up to high school, have never studied a foreign language or even experienced the challenge of language learning by the time of graduation (PEW Research Center, 2018). This lack of exposure to other languages and cultures leads to lack of empathy toward other cultures, which in turn leads to unrealistic expectations of immigrant children being asked to function academically in English. If decision-makers had studied different languages in their lifetime, they might better understand these challenges and have a more realistic picture of how much and how quickly one can learn. World language education has a vital mission: to spread the experiences of learning different languages and cultures and to nurture us as global citizens. Language learning helps build metalinguistic awareness, develop critical thinking skills, and it encourages us to reflect and compare different cultures (Fox et al., 2019). If people can learn to be more accepting, differences will be better tolerated and hate crimes and violence against minorities will surely decrease.

1.3 Japanese Language Education in the US

The US Department of State has determined Japanese is a critical world language. Among those on the list, Japanese is the most popular, despite having been categorized as Category IV, one of the most difficult languages for native speakers of English to learn (American Academy of Arts & Sciences, 2020).

Japanese language is also situated as a less commonly taught language due in part to its complexity. Although Japanese enrollment in the US is not on the same level as Spanish enrollment (MLA, 2009), Japanese language education blossomed in Wisconsin alone in the 1990s. Many public schools throughout Wisconsin, including Milwaukee Public Schools (MPS), offered Japanese language courses. The programs were well-funded by each school district at the time out of interest for future career path opportunities. There are now only a handful of these programs left in Wisconsin. The Japanese offerings in the high schools of most cities and towns mirror this phenomenon. However, this does not mean that the level of interest in Japanese language and culture among high school students has decreased. It is quite the opposite. Survey results from the Japan Foundation indicate that interest among students is actually increasing and enrollment in Japanese language programs has grown almost 30 times as compared to 39 years ago (The Japan Foundation, 2018). Yet the status of the remaining schools offering Japanese language reflects budget cuts and opinions that high schools should focus instead on other core subjects that directly support standardized testing. These opinions follow from the No Child Left Behind (NCLB) Act.

Although US high school enrollment in Japanese classes is decreasing, postsecondary enrollment does not reflect the same trends. According to the web publication by Modern Language Association of America (Goldberg et al., 2015), Japanese is the most popular, with

enrollments of 66,740, among all critical languages tracked by the Critical Language Scholarship Program run by the US Department of State in 2013.

According to a Japan Foundation survey (2018), the primary impetus for those learning Japanese is their deep interest in Japanese popular culture, namely *anime* and *manga*. The survey demonstrated the fact that “‘*interest in manga, anime, J-Pop, etc.*’ (italics in original) was more frequently cited than ‘interest in history, literature, etc.’ makes it clear that Japanese pop culture has made its mark throughout the world, establishing itself as a starting point for interest in and involvement with Japan and the Japanese language” (The Japan Foundation, 2018).

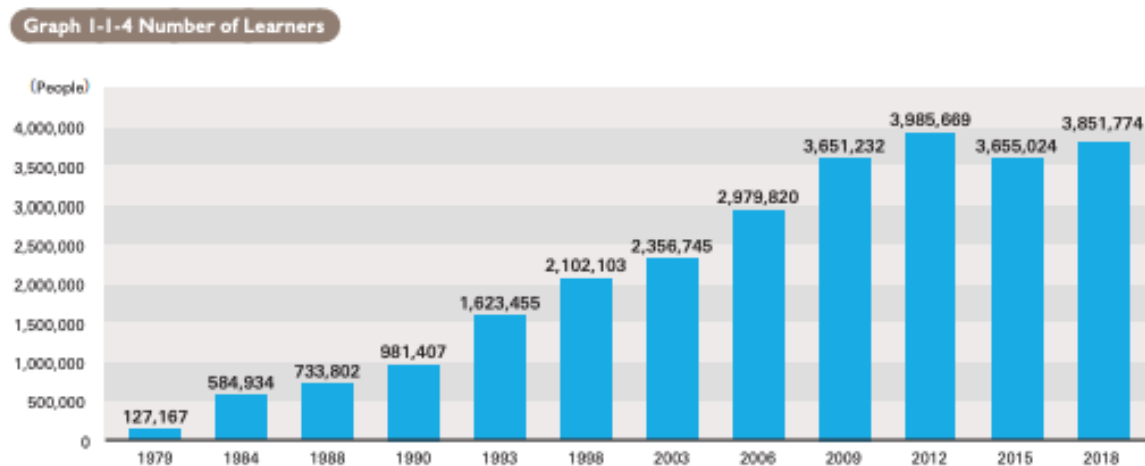


Figure 1.1: Number of Learners from “Survey Report on Japanese-Language Education Abroad 2018” by the Japan Foundation

Although students may start taking Japanese out of interest in pop-culture, more and more students in the STEM fields are finding jobs utilizing their Japanese language skills due to a workforce scarcity in Japan. Japanese and US global companies are looking for bilingual college graduates to work within their conglomerates. Japan is a leading country for robotic technology and science, and global cooperation is becoming more commonplace.

1.4 Unique Challenges of the Japanese Language

The value of each language is determined by each country and guided by which language that country feels will bring it economic prosperity. In the US, those language offerings that get promoted have been determined by this value system rather than by direct interest in the language itself. Taking Japanese language education in the US as one example, as the Japanese economy boomed in the 1990s, the popularity of Japanese language spiked after “A Nation at Risk” was published in 1983 (Rudolf, 2014). In Wisconsin, in the 1992-1993 school year, 33 school districts from elementary to high school were offering Japanese language courses (The Japan Foundation Language Center, 1993). As the Japanese “bubble economy” burst in 1990 (The Japan Times, 2009) and the Chinese economy began to influence the US economy more, these Japanese language programs were often replaced with Chinese language programs nationwide (Rudolph, 2014). Despite this, and although enrollment in high school Japanese programs dropped or the programs even eliminated, the number of learners of Japanese outside of Japan increased 30.3 times as compared to 39 years ago (Japan Foundation, 2018). This major increase is due to the popularity of Japanese popular culture, specifically *anime* and *manga*, among American youth (the Japan Foundation, 2018). This is an indicator of the gap between our students’ interests and the political force of the school board. The reason enrollment in high school Japanese programs is now lower is due to program elimination despite active interest in learning Japanese. Despite their interests, very few high school students can pursue, or are even aware of, the option of taking Japanese in college. Once students enter college and can take courses according to their personal interests, a great number of them select Japanese and this has resulted in consistently high enrollment numbers for many Japanese language programs. As

mentioned previously, these students often end up studying a world language for the first time and are not otherwise equipped with any language learning experiences.

Language learning is a time-consuming task, and this is particularly true for Japanese. Due to its remoteness of language structure from English (Chiswick & Miller, 2004), Japanese is situated as a category IV language according to the Foreign Service Institute. That means that native English-speakers who are learners of Japanese need to spend four times longer to reach a similar proficiency level as compared to learning a Category 1 language such as Spanish, French or Italian.

Some of the difficulty lies with the fact that authentic modern Japanese texts contain three different orthographies. They are *hiragana*, *katakana*, and *kanji* (Chinese characters), and a fourth if you include *romaji*, the romanization of Japanese into words meant for foreign “pronunciation.” The Japanese are a borrowing culture and *kanji* was adopted into the Japanese writing system from China starting in approximately the 6th century at a time when Japan was yet to have its own systematic writing system (Varley, 2000). *Kanji* are ideograms carrying meaning so the Japanese people at that time associated Japanese readings with some *kanji* while borrowing Chinese readings for other *kanji*. Due to Japan’s history of trading with China over many years and its ongoing propensity to adopt from outside cultures, some *kanji* “arrived” in Japan multiple times from multiple dynasties of China. The result, *kanji* now have multiple readings, sometimes Chinese-origin readings, sometimes Japanese-origin readings and sometimes even multiples of each (Shibatani, 1990). *Hiragana* is a syllabary script and is currently used for writing Japanese origin words, for writing grammatical function words such as particles, and verb/adjective endings, and for writing phonetic guides to indicate *kanji* pronunciation. Even for Japanese, pronunciation can be complex. One *hiragana* represents one

phonetic unit or syllable and there are a total of 46 different *hiragana* used in modern Japanese. *Katakana* is also a syllabary script and is used to write foreign origin words, onomatopoeic sound words, and words that get “italicized” in order to stand out to be stressed. Just like *hiragana*, one character of *katakana* represents one phonetic unit and there are a total of 46 different *katakana*. Nouns, verbs, and adjective stems are typically written in *kanji*. Therefore, a simple sentence such as, “I am studying French at university,” is written as “私は大学でフランス語を勉強しています。” Nouns such as “I,” “university,” “language,” and the verb-stem of “study” are all written in *kanji*. “France” is written in *katakana* to show it is a foreign origin word, and all other grammatical function words and verb-inflections are written in *hiragana*. To that end, all three writing systems are used simultaneously to complete everyday sentences. The fourth writing system is commonly used in public and private spaces for visitors and foreign nationals. For all the above reasons, reading Japanese is a daunting task for beginning (and even advanced) learners of Japanese, especially for those whose first language is based on a Romance-language.

The first challenge that Japanese as a world language (JWL) learners face is vocabulary. Although there are some words that derive from English words, known as English loan words, due to the level of language remoteness, there are not many guessable words for English speakers. Nor are there many words where English speakers could apply their English language knowledge onto Japanese vocabulary. The second challenge is word order. Word order in Japanese is SOV (subject, object, verb), which is essentially the opposite of English (subject, verb, object) (Kuno, 1973; Shibatani, 1990). A third challenge is that modifiers are placed right before nouns. For example, when you state, “I read books that my friend recommended.” in Japanese, it is expressed in the order of “I” + “my friend recommended” + “book” + “read” (私

は友達が薦めてくれた本を読みます)。 This means that learners of Japanese need to constantly navigate a word order that is very different from English as well as figure out which portions need to modify which nouns. Apart from these distinctions, further challenges are that the language incorporates frequent subject omissions, various layers of politeness and humility registers, and, naturally, the utilization of multiple different writing systems all at once.

1.5 The Current Status of World Language Education

After the rise of the Internet, the field of information technology has changed society and the way people learn. The younger generation do not know a time without the Internet and cell phones. Technological advancements have changed society and even the job market. While technology may have overcome geographical and physical distance challenges, the job market now requires individuals who can be fluid among different languages and their cultures. In addition, with the onset of Covid-19, integrating technology into language classroom was accelerated. With the sudden switch to all remote learning in US secondary and postsecondary institutions in 2020, many educational institutions utilized Learning Management Systems (LMS), and multimedia and multimodal learning became part and parcel of learning.

The evolution of the Internet and technological advancements have transformed the language education landscape, offering new opportunities to incorporate authentic materials into the classroom. Language education in the twenty-first century is no longer a matter of mere memorization of grammar and vocabulary, but rather a reflection of how one might actually use language and cultural knowledge when communicating with people around the globe (Byram, 2021; Eaton, 2010; Tohsaku et al., 2021; *World-Readiness Standards for Learning Languages*, 2015). The technological revolution has deeply impacted students' learning styles as well as what is expected from teachers in the classroom. Today's learners have easy access to the

Internet for information and to multimedia materials such as YouTube and other social networks, each of which having their role in further shifting students' learning styles. Learning through virtual reality (VR) games, for example, engages multiple senses. Their learning has come closer than ever to real life situations and is no longer limited to books and lectures alone. Students prefer more visually appealing multimedia and multimodal materials. Students expect learning materials to be more realistic and this is most certainly achievable through technology.

In today's world language classrooms, it is important to teachers that students know how language is used in proper context and that students can accomplish tasks in real-life situations. In the field of world language teaching, a framework and asset-based approach is favored to assess student progress. This is replacing the traditional method of evaluation (Byram & Wagner, 2018b; Eaton, 2010). Some examples are the Canadian language benchmarks for English and French, the Common European Framework of Reference for Languages (CEFRL) in Europe, and the World-Readiness Standards for Learning Languages and the Can-Do Statement of ACTFL in the US (NCSSFL & ACTFL, 2017). In its World Readiness Standards, ACTFL states that language learning should go beyond the classroom. Teachers' goals should be to ready learners for the real world so that they may apply learned skills to both their careers and life itself. (*World-Readiness Standards for Learning Languages*, 2015). The focus of World Readiness Standards for learning languages is that teachers facilitate a learning environment where students can learn "genuine interaction with others" rather than concentrating solely on the "how (grammar) to say what (vocabulary)" (*World-Readiness Standards for Learning Languages*, 2015). The important thing in language learning in the 21st century is that learners learn real skills usage, and how to apply it. Mastering the knowledge of grammar or vocabulary does not in itself provide enough opportunity for students to learn correct usage. Correct usage always

comes with special context. Students need to learn to use the correct grammar and the correct vocabulary and how to use it under varied contexts. Best practices in world language education are closing the gap on real language use so it matches both context and communication. Naturally, it then follows that traditional styles of assessment also do not fit with today's real world (Pappamihel & Walser, 2009). Today, language acquisition focuses on more nonlinear styles of interaction and communication. The trend in world language education is more and more a student-centered pedagogy. This pedagogy includes more project-based and content-based teaching methods and portfolios, in which students can feel a sense of ownership. The important thing that language teachers need to remember is to ask how they can nurture learners to take further steps using the language.

In today's language classroom, successful language learning reflects real context based on cultural knowledge resulting in real use. Students are surrounded by multimodal materials in their daily lives, and their learning styles have been altered as a result. Course site programs such as Canvas and Blackboard are now popular among higher education initiatives and many learning activities are now linked to the very technology of these sites. Vocabulary learning tools such as Quizlet have become very popular among language educators and learners due to their ease of standalone use as well as their ability to be snapped directly into the course site platforms themselves. Multimodality is a way to implement more student-centered activities and to increase participation in learning, not to mention it is also a means to reflect real-world language usage. As one of the seminal researchers in multimodality, Halliday (1989) emphasized the function of the language and language usage reflected by context. Halliday (1999) again discussed the importance of context from the viewpoint of language education. In order to understand text, either spoken or written, one must understand the context of the text that

surrounds it (both the context of culture and the context of the situation). *Manga*, or Japanese graphic novels, is a unique format that encompasses both the aspects of written and of spoken language. With multiple sign systems presented in each *manga* panel, a context is created in which readers can interact with all semiotic symbols to make meaning. In these moments when things “click” for learners, this is where learning occurs, and Halliday called this “realization.” He explains, “It (realization) is a semiotic relationship; one that arises between pairs of information systems, interlocking systems of meaning” (Halliday, 1999, p. 15). Halliday’s systemic functional grammar, the context needed for language learning, and their relationship to *manga* will be further explored in the next chapter.

1.6 Manga and Graphic Novels in Language Classrooms

Manga, as mentioned previously, are one of the key motivators driving students to study Japanese. Although it is not the case that all students are interested in *anime* and *manga*, it is a motivating factor for many, and most have at least some levels of interest in these cultural forms. Therefore, if someone has strong intrinsic motivation to study Japanese via their exposure to *manga* or *anime*, integrating these materials into the classroom has strength of purpose in terms of maintaining or even amplifying that interest. According to Kumano and Hirokaga (2008), research on integrating *manga* and *anime* into the Japanese language classroom started in the 1990’s when multimedia materials started to receive some attention (as cited in Tajima, 2017). However, copyright issues became a large obstacle to using these as teaching materials, and for this reason, it did not spread as widely in Japanese classrooms. In the 2000’s, there were many case studies of instructors implementing *anime* into their classrooms (Tajima, 2017). However, the majority of these studies are teaching reports of how they used *anime* (movies/videos) in classrooms more so than *manga* (written materials). In the 2010’s, more case studies reported

focusing on how to use *anime* and *manga* in classroom activities (Tajima, 2017). Among these studies, once again, many of them are *anime*-related, and it is often the conclusion that students are better connected to learning Japanese when sources are fun and foster more learner autonomy. Research on extensive reading and its effect on learning language gained popularity in the 2000's (Nation, 2015, 2022; Waring & Takaki, 2003; Waring, R., 2011), and subsequently in Japanese pedagogy (Hanabusa & Juhn, 2018; Yoshimura & Sharon, 2017). The research concerning motivation and its implementation into classes dealt with input through incidental reading and its effect on vocabulary learning. Yoshimura's study discussed *manga*'s usage and popularity among students as an extensive reading resource in JWL classroom. (Yoshimura & Domier, 2017).

1.7 Vocabulary Acquisition in World Language Education

Vocabulary learning is usually the first step when you start learning a world language. Although vocabulary learning is essential for language study, this area of research was overlooked for many years, until the late 1980's (Ketabi & Shahraki, 2011; Senoo, Y., & Yonemoto, K., 2014). Many world language classrooms' vocabulary acquisition very much depended on each learners' effort (Cohen & Macaro, 2007; Mizutomo & Takeuchi, 2009).

Starting in the late 1980's, researchers began to further investigate effective vocabulary learning strategies in second language learning (Cohen, 1991; Gu, 2003; Gu & Johnson, 1996). In addition to studies on strategy-based vocabulary learning and mnemonic device methods (Cohen, 1991), there is a recent movement to search for more effective vocabulary teaching through incidental learning via extensive reading (Nation, 2022). Incidental learning is defined as a by-product of classroom learning. One of the examples is that learners acquire vocabulary through reading. When learners read a book and learn some words through reading, it is called

incidental learning. Extensive reading is defined as an approach that encourages learners of world languages to read extensively to gain proficiency of the language. Learners gain proficiency of the language incidentally by reading many books. In contrast, intensive reading is defined as a language learning approach where learners engage with text through in-depth reading.

Manga has aspects of both extensive and intensive reading. If a student reads many *manga* that are a little above their proficiency level, it is considered extensive reading. If the student reads *manga* while focusing on understanding the content and its language use, this is intensive reading.

Nation has noted that extensive reading has gathered considerable attention. Many studies on extensive reading overwhelmingly indicate its positive impact on motivation, reading fluency, reading comprehension, vocabulary growth, writing skills, grammar knowledge, and overall language proficiency (Nation, 2022). Many studies have indicated that extensive reading can result in vocabulary acquisition (Day, Omura, & Hiramatsu, 1991; Dupuy & Krashen, 1993; Horst, 2005; Horst, Cobb, & Meara, 1998; Hulstijn, 1992; Pitts, White, & Krashen, 1989; Waring & Takaki, 2003 as cited in Webb & Macalister, 2013). However, the specific mechanism for how extensive reading impacts vocabulary acquisition is not discussed except to state that the learners should be exposed to materials at the right level, which is arguably approximately one unknown word for every 50 known words (West, 1955 as cited in Nation, 2022). Laufer and Hulstijn proposed the Involvement Load Hypothesis and claimed that learners who worked to infer the meaning of words from context retained those words better than when they received synonyms of the words.

Previous studies indicated that multimodal pedagogy helped with long-term retention of vocabulary (Aghaei & Goughani, 2016). Graphic novels supported learning figurative idioms significantly better than a control group (Başal, et al., 2016). And a combination of textual and pictorial glosses was more beneficial, possibly due to being exposed to two modes of input (Tabatabaei & Shams, 2011; Al-Seghayer, 2001; Chun & Plass, 1996; Yeh & Wang, 2003; Yoshii & Flaitz, 2002).

Manga is unique in that it visually presents speech in talking bubbles, distinguishing itself from short movies. Even though one may not be able to fully comprehend another's speech due to a lower language proficiency, one can more readily follow the dialogue with less effort by viewing speech in written form.

There are very few empirical studies showing how effective *manga* can be for Japanese learning nor how learners process these multimodal materials and integrate them into their learning construct. In view of this research gap, the current study aims to discover how *manga*, as multimodal learning material, may assist in the learning of Japanese, and more specifically, Japanese vocabulary.

Therefore, the current study fits within scholarship about *manga*'s multimodality and vocabulary acquisition through *manga*. The next chapter presents previous research that delves into multimodality, Systemic Functional Linguistics (SFL), and how *manga* possesses the quality of multimodality to provide context and assist with language learning. The following literature review section will also attempt to unpack former research on the systems of vocabulary learning through reading and how that former research may intersect with *manga* as multimodal material.

2. LITERATURE REVIEW

This chapter will discuss multimodal learning and teaching in world language classrooms, along with *manga* as multimodal material, and vocabulary learning as a necessary means to an end in world language instruction. First discussed is the literature explaining multimodality and *manga* as a multimodal form of material. The second area to be explored will be previous studies on vocabulary learning, the importance of context in language learning, and how *manga* creates context. Thirdly, Paivio's Dual Coding Theory and Hulstijn's Involvement Load Hypothesis, and how they explain how one retains vocabulary, will be examined. Fourth is a discussion of the brief history of vocabulary acquisition in second language acquisition and quantitative vocabulary learning studies that involved multimodal materials. Lastly, this study reviews *manga*'s potential to be used in JWL and other world language classrooms.

2.1 Multimodality and *Manga*

2.1.1 What is Multimodality?

One of the aims of the current research is to examine *manga*'s potential as a multimodal material. In order to do so, the characteristics of multimodality must first be examined. The concept of multimodality gained increased attention in 1990's academic circles (Bezemer & Jewitt, 2018). Simply put, multimodality is the combination of multiple modes. It is also the study of how people make meaning by combining these multiple modes or semiotic resources (Kress, 2012). Jewitt, Bezemer and O'Halloran (2016) state that the term "multimodality" is frequently seen in a wide range of disciplines such as media studies, semiotics, education, linguistics, sociology, and psychology. Although the term, "multimodality" is newly coined when compared with the overall history of human communication, the concept of multimodal communication has been around for as long as we have been talking about human development.

Within human communication, our minds have access to various modes such as gestures, pitch of voice, eye movement and prosody, to name a few. The speaker and the listener use all these modes, one at a time or all together, to co-create meaning and co-negotiate that meaning as they communicate.

Jewitt, Bezemer and O'Halloran (2016) emphasized that different modes of meaning-making, such as speech with body language or images with text, occur simultaneously rather than separately. Due to the advent of digital technologies, the study of multimodality developed along with the researchers who attempted to clarify “an integrated, multimodal whole” (p. 2) rather than study an entity of unifying discrete modes. They stressed that one should observe the “co-occurrence and interplay of different means of making meaning but also that each ‘mode’ offers *distinct possibilities and constraints*” (p. 3).

Bazalgette and Buckingham (2013) defined multimodal analysis as follows: “(it is) to investigate how the interaction between modes can produce meanings that are more than the sum of the parts” (p. 96). In their article, Bazalgette and Buckingham point out that the definition of multimodality is often misrepresented. One criticism is the misuse of the word multimodal, even in the field of education, to incorrectly reference multimedia material itself. Because multimodal research is trending, some educators even reference it in order to convince school administrators to make changes in the classroom. Additionally, the term is sometimes wrongly used to portray that texts as multimodal simply because they are multimedia in nature or because they appear on the Internet. They remind us of the difference between “multimodal text” and “multimodal analysis,” and this confusion is apparent.

According to previous research, multimodality is defined as the study of how people make meaning by interacting with different modes. What previous studies stipulated was that

people constantly make meaning in natural language occurrences by interacting with different modes and interpreting their language phenomenon. What is important in multimodality is this interaction and the interplays of meaning-making action, instead of a discrete and separate interpretation of modes. Reading *manga* is intertwined with the study of multimodality in terms of how it provides continuous meaning-making moments through combined text and image with which readers engage. In reading *manga*, readers constantly interact with the images and texts and create meaning by bringing their own world knowledge to interpret the occurrence on the page.

2.1.2 Mode

To better understand the definition of multimodality, it is necessary to discuss the definition of “modes.” Modes are semiotic resources, and the resources with which we make meaning (Kress, 2012). Examples of modes are texts, images, sounds with moving images, speech with gestures or even gazes or glances. If text is underlined, italicized, or has bolded letters, it creates new and different meaning than even plain text—people process modes by giving them importance during the creation of meaning. For example, in *manga* reading, if you see bolded letters such as **BANG** or **POW**, it adds meaning that a noise is loud. The term “modes” is used differently depending on the researcher (Mills, 2015). According to Kress and van Leeuwen (2001), mode means “a set of socially and culturally shaped resources for making meaning” (as cited in National Center for Research Methods). Modes are culturally shaped and fluid. For example, gestures are not the same in every culture. Each mode has a different range of meaning and potentialities, but people from different cultures may not recognize and follow the same meaning-making process. This is called “affordances” (National Center for Research Methods, 2012). The term “modal affordance” adopted by Kress (2010) refers to the

“potentialities and constraints of different modes.” Modes encompass a range of potential meanings, and depending on how that mode is situated, culturally, socially, or historically, gives rise to what it could mean and/or could not possibly mean (National Center for Research Methods, 2012).

The notion of “modal affordance” corresponds with Halliday’s “potential.” Halliday explains the process how people reach to the potential in detail. Halliday (1999) states:

The system is not some independent object; it is simply the potential that lies behind all the various instances. Although the actual texts that you process and produce will always be limited, the potential (for processing and producing texts) has to reach the stage where it is unlimited, so that you can take in new texts, that you haven’t heard or read before, and also interact with them — interrogate them, so to speak, argue with them, and learn from them. (That, of course, is a high standard to attain.) (p.8)

In one panel of *manga*, readers will interact with different modes and the affordance (potential) is almost infinite because each learner brings their own prior knowledge with them. Readers bring their culture to the interpretation of these modes, which likely contains its own culture, whether or not the specific text explains cultural items. Even though learners may read the same text with images, the affordances are different from learner to learner as each brings their different cultures with them. Halliday explained how people process different modes when they access them. Readers of *manga* interact with the modes, think about the possible interpretations by interrogating the language system, and they come to an understanding of the meaning.

2.1.3 Brief History of *Manga*

The previous section discussed the definition and nature of multimodality. This section will explore how *manga* can be a multimodal material based on a brief history of its development, including its origins, and we will start to see how it helps to build context.

Manga is believed to have originated from the “*Chojugiga*” or “Scrolls of Frolicking Animals” in 12th century Japan (Toku, 2001; Shimizu, 1991, 2009) (see Figure 2.1).

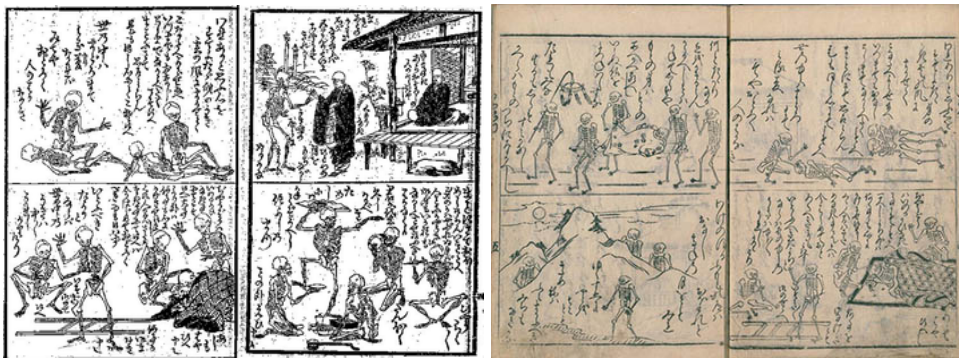
Figure 2.1: *Chojugiga*, est. 12th century—date unknown



In *Chojugiga*, there were no frames, nor any speech balloons as seen in modern *manga*. Readers “read” from right to left and top to the bottom. As you read, you unwind the scroll to the left. This movement itself helped to represent how the story progressed. Gravett (2004) speculates that this method, being similar to the panel progression in modern *manga*, is how *manga* developed today. The facial expressions and body language of the frogs, monkeys and rabbits are comical and vivid as if they are conversing with each other. Although there is no text that describes a story, you can infer such a story through the interaction with these images. One reader may interpret the story as: There is a rabbit and a monkey, and the rabbit is chasing after the monkey as if to say, “Wait up!” There are two frogs behind them appearing to call out “Let’s catch the monkey!” The interpretation of it now will of course vary depending on the reader’s world knowledge and culture, but readers at the time might have had more shared experiences leading them to a common understanding of what the “author” might have intended to describe. Although there is some debate on the author’s intention, *Chojugiga* is believed to be a satire of the corrupt Buddhist community of the time (Gravett, 2004). If you were living at the time and saw the scroll, the interpretation of it may be different.

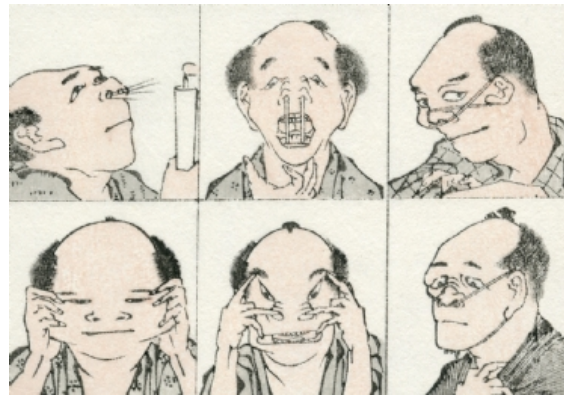
In modern *manga*, there are features in each panel called *fukidashi*; these balloons hold speech. The *koma* are the small panels around each boxed segment which helps to indicate the passing of time and encourages the progression of the story. These, along with graphics, help to create both narrative and context (McCloud, 1993). The first appearance of *koma* is in the beginning of the Edo era. *Koma* was observed in *Ikkyu gaikotsu* (Skeleton Ikkyu, 1675, Shimizu, 2009, p. 3-5) (see Figure 2.2), and this story tells of the teachings of Buddhism through a well-known monk, *Ikkyu* (Shimizu, 2009).

Figure 2.2: *Ikkyu Gaikotsu*



It is speculated that this story was used to spread Buddhist teachings to commoners who were illiterate (Varley, 2000). Although it is likely that commoners could not and did not read the text, they would have understood the story and the teachings based on what they saw. The meaning of *manga* literally means “humorous picture” (Toku, 2001), and *Hokusai Katsushika* (1760 - 1849) first used the word in the Edo period (1600 - 1868) in his book titled *Hokusai Manga* (see Figure 2.3). From this, he developed this segmented style to depict the comedic life of commoners via caricatures (Shimizu, 1991, 2009; Toku, 2001).

Figure 2.3: *Hokusai Manga*



After Japan opened the country to the outside world in the Meiji era (1868-1912), an influx of Western culture arrived. A British editor, Charles Wirgman (1832-1891) published the cartoon magazine *Japan Punch* in Yokohama. His style of caricature brought a Western influence to the *manga* of Japan (Shimizu, 1991), adding to the experience of reading varied styles of *manga*. The current style of *manga* was established following World War II, with US comics and Disney animation influencing it greatly (Brenner, 2007). After the war, people were impoverished, dispirited, and were seeking inexpensive entertainment (Shimizu, 1991). *Manga* was perfect as many people could enjoy it (Shimizu, 1991; Toku, 2001). *Osamu Tezuka* is one of the first *manga* artists to become extremely popular during this time, and therefore is considered the grandfather of modern *manga* (Brenner, 2007).

Hokusai manga was the start of the style of “*yonkoma manga*” or four-panel *manga* (Shimizu, 2009). The development of *yonkoma manga* intertwined with Western influence and its major influence was US cartoonist, George McManus’s “Bringing Up Father” published in the early 1920’s (Gravet, 2004). This four-panel cartoon was translated into Japanese, and published with the title “親爺教育 (*Oyaji Kyoiku*)” in the Tokyo Asahi Newspaper Evening Edition (Shimizu, 2009). Having been influenced by this success, a Japanese rendition *yonkoma*

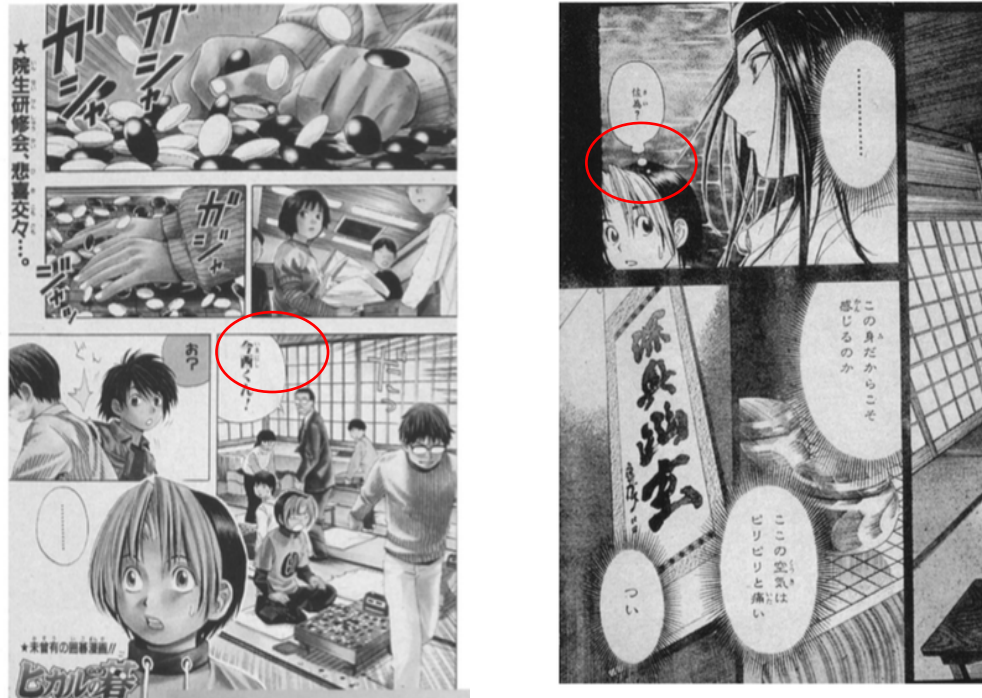
manga called “*のんきな父さん (Nonkina Tosan)*” or “Easy-Going Daddy” by a Japanese artist subsequently appeared in the 1923 Hochi Newspaper, and lasted until 1930, even after it moved to an entirely different newspaper. This lengthy hit influenced the popularity of the *yonkoma manga* because its four-segment narrative style fit well with the narrative style of 起承転結 (*ki-sho-ten-ketsu*) used in other Japanese writings (Shimizu, 2009). *Ki-sho-ten-ketsu* indicates how a story expands. The 起 (*ki*) means the beginning of the story and it usually introduces the topic. The 承 (*sho*) means expanding the story. The 転 (*ten*) means a shift in the story, usually to something unexpected. The 結 (*ketsu*) is the conclusion of the story and often provides a funny twist. This style of narrative originated in ancient Chinese poetry called *zekku* (Kotobank, n.d.) and is taught in Japanese secondary schools to this day. As a distinctive style, it may not be common among the *manga* seen in the West today, however, it is a common type seen in Japan. Due to its more condensed nature, the current study employs the *yonkoma manga* style as its format.

2.1.4 Context Building Feature of *Manga*

The striking feature of *manga* is that it has 1) pictures depicting objects and figures, 2) words, including those for onomatopoeic sounds, 3) *fukidashi* or balloons to indicate speech, and 4) *koma*, or panels, surrounding scenes to indicate a progression of time. These are “the elements of *manga* or grammar of *manga*” (Natsume, 1997 as cited in Toku, 2001, p.13) and are features that all readers immediately understand. The sequence of pictures along with the text create a “meta-level space and mind in response to the complicated story” and jointly constructs a narrative and context (Toku, 2001, p.13). The balloons present an outside voice or an inside voice of the character (Toku, 2001). The shape of the balloons indicates whether the speech represents live dialogue or merely the character’s thoughts. As seen in the following examples

(See Figures 2.4), balloons with solid lines show speech while balloons with dotted lines show thoughts.

**Figure 2.4 Example of *Manga's Grammar* (from: Toku, 2001, p.14 & p. 15)
From *Hikaru no Go* in *Shonen Jump*. No. 52-53, 1999.**



The panels show time and story progression. As in the original, Japanese *manga* are written from right to left, and top to bottom. Figure 2.4 depicts how one person who was playing the game of *go* became frustrated and slammed his hands down making a loud noise. People in the room heard it and turned to look and just as he stood up to leave, he rudely bumped into a boy as he left. Readers benefit from this key feature of *manga*; it builds context as it supports the narrative. Even though readers might not fully understand the Japanese text, they are still able to follow the flow of the story. When learners read the text along with the images, they can decipher the gist of the story even through unfamiliar words. Using Figure 2.4 as an example, when you see the slamming hands you can assume a loud noise was made and you see the text

“*gasha gasha*” (written as “ガシヤガシヤ”). A reader will understand and simultaneously recognize the text as a loud noise and associate the descriptive phrase “*gasha gasha*” with that sound, as “described” by the picture. Readers interact with the image and the text and combine these two modes, and in that moment, they learn that “*gasha gasha*” is the onomatopoeic representation of the sound created by the person slamming their hands and making noise with the *go* stones. They have inferred the meaning of a previously unknown word.

As examined, *manga* creates context. It has its own grammar of language with the design of the panels, indicating time progression. The images show who is involved in actual conversations and the thought bubbles provide their internal thoughts. They show where a conversation takes place and the main purpose of that conversation. Readers of *manga* go back and forth among different modes (semiotic resources) and infer meaning based on the knowledge and culture they bring to the story.

2.1.5 Systemic Functional Linguistics and Context of Language

Manga is a collection of different modes that may hold culturally specific meaning or universal special emphasis. Readers of *manga* bring their prior experiences and linguistic knowledge to the modes, interact with them, and in the end, make meaning. Examining Systemic Functional Linguistics (SFL) will aid in understanding this meaning-making moment and how it occurs.

SFL studies the natural state of language and attempts to explain systems of language through context and function. Without context, one cannot correctly understand what is meant by a conversation or even grasp the message in a reading because discrete sentences could mean completely different things depending on the context. For example, the sentence “My new shoes!” may mean that the person just bought a new pair of shoes and is happy about them, or it

could mean a dog chewed and ruined the pair of shoes. One sentence separated from its context could have several different interpretations. *Manga* provides context visually and readers of *manga* interact with different modes contextually.

Hori states that Halliday defined three elements that compose the context behind texts (Hori, 2006). When people converse with each other, there is “field,” which is the topic and the purpose of the conversation; there is “tenor” for those who are engaged in conversation; and there is “mode” which indicates the method of communication. These three elements appear as a combination of text and images and constitute core components of *manga*; they form the basis for understanding a context. Readers of *manga* can visually understand where the conversation or the situation are taking place and purpose of the conversation (field), who is engaging in the language activity (tenor), and whether the language is spoken or written (mode). Even though beginning-level learners may not yet possess the level of proficiency required to read the text, they are able to access the information that supports inferring the context and are able to make meaning of unlearned vocabulary. At its very basic level, *Manga* contains field, tenor and mode and could fill a readers’ comprehension gap by supplementing and building context through the multimodality of texts and images.

2.1.6 Text and Context

It is context that makes mutual understanding possible. Due to context, the listener can anticipate what a speaker might be about to say. With context based on the situation and circumstances, the interlocutors receive information that is expected to indicate and predict what a text or a conversation means. Halliday stated that there are two types of contexts: “context of culture” and “context of situation” (1999). The context of culture could mean a culture in a different ethnic group or country and could also include the particular ways language is used

such as in the field of math or science. The context of situation refers to the events and occurrences that are taking place around the language. When learners or readers engage in a language activity, they gather these potential meanings, interact with them using their culture and prior knowledge, infer information reflected by the context, give thoughts on the language system such as grammar, and finally come to a meaning-making moment.

Halliday also claimed that the reader and the listener will predict what may be coming next based on the connections between the text and the context (1999). By this prediction, the reader/listener reads and listens to how the story expands. This prediction is an important part of reading and listening to language. Without this prediction, the reader/listener may completely miss the point of the text. Halliday further explains, “the context of situation and the wider context of culture make up the non-verbal environment of a text” (Halliday, 1989, p. 47). When learners encounter unfamiliar information, they try to identify the missing piece of information by reflecting on the context. This intertextuality supports us in understanding, “how people actually exchange meanings and interact with one another” (Halliday, 1989, p. 47). He states that the relationship between text and context is dependent on each other. Halliday states: “[m]eaning’ arises from the friction between the two. This means that part of the environment for any text is a set of previous texts, texts that are taken for granted as shared among those taking part” (Halliday, 1989, p. 47).

This “prediction” could then be explained in different terms such as “inference” or “construe” as in, the act of understanding. Inference is a very important skill in learning a language, and learners can be trained in this skill to improve their proficiency (Nation, 2022). When readers read *manga* and encounter unfamiliar words, they infer or predict the meaning of the word as it is supported by context. This act of “inference” occurs when readers are

constructing meaning. It shows how the message on the page is structured and when unfamiliar words are encountered, context assists you in guessing their meaning. When a *manga* reader stumbles upon an unknown word, the reader gathers information by interacting with the image and the text, identifying the gap between the text, the image, and themselves, and infers what the word may mean.

As seen, multimodality is not merely the presentation of two modes. Instead, it is the synergy of how these different modes create meaning by interacting with the reader (Jewitt, Bezemer & O'Halloran, 2016). *Manga* is a co-occurrence and interplay of two different modes: the images that appear in *manga* provide the context and the text portion provides the information. Images that appear in *manga* represent mode and play a part of language. The text and image information interact and create meaning potential (affordance). The information that appears in one panel of a *manga* story provides intertextuality and this intertextuality provides the opportunity for readers to interact with both image and text. This gives learners the opportunity to negotiate the meaning of unfamiliar information. Language that is spoken cannot be “seen.” However, *manga* has the unique characteristic of allowing readers to not only see speech in bubbles but also read it again as needed for understanding. It is like the still pictures of a movie but in written format. When learners of language encounter text, they delve into the relationship among modes or semiotic resources, reflect on the context, consider all meaning potentials with all semiotic resources, and construct the language system in their mind. These choices of meaning potentials vary depending on the person. Learners constantly engage in the action of prediction both from context and from text (Halliday, 1999). This act of negotiating meaning occurs when readers access the multimodal nature of *manga* and work with the gap of information provided among different modes (intertextuality). Such acts of negotiating meaning

are needed for learning vocabulary when reading. However, learners of a world language cannot engage in this act of negotiating meaning when they do not have enough information to support inferring context. It could be too challenging for world language learners to predict and understand the unfamiliar word if they do not have enough experience in engaging such predictions and are not familiar with the pattern.

In summary, context supports prediction. Without knowing the context, it is difficult to predict the text and vice versa. Once one can access a given situation and knows what is happening, one can now decipher what was said or written and distinguish it from the rest of the text. If learners of world languages engage with new text without images, the burden they may face could be too great. And further, for those who are lacking proficiency, too many unfamiliar words in this scenario may prevent the creation of context and ultimately prevent understanding. *Manga* has the potential to decrease this burden on learners. Presentation of text along with images means JWL learners who read *manga* are able to access layers of information that are not available otherwise.

2.2 Multimodality and Input Hypothesis

This study has examined the definition of multimodality, how *manga*'s multimodality assists with building context and how context and intertextuality in *manga* may bring learners to inference and negotiating meaning. This section will explore the concept of “inference” from the standpoint of second language acquisition (SLA) theories, namely the Input Hypothesis and the Noticing Hypothesis.

2.2.1 Context and the Input Hypothesis

In reading *manga*, readers are exposed to countless moments of negotiating meaning. They compare the information between texts and images. They use their own context to fill the

gaps of information. When interacting with semiotic resources, one negotiates meaning with said resource, constructs context, and comes to the meaning-making moment. Halliday called this “realization” (Halliday, 1999). For better learning, Halliday (1999) stated:

The learner has to (1) process and produce text; (2) relate it to, and construe from it, the context of situation; (3) build up the potential that lies behind this text and others like it; and (4) relate it to, and construe from it, the context of culture that lies behind that situation and others like it. (p. 23)

Manga supports this process and provides learners with the tools to build the necessary context, even if the learner does not possess sufficient language proficiency. When the semiotic resources suddenly connect like puzzle pieces, “realization” occurs. This is the meaning-making moment, and this concept aligns with Schmidt’s noticing hypothesis and Krashen’s comprehensible input, or the idea that learners need a certain amount of information to support new learning. For the purpose of inferring unknown words in *manga*, this is where *manga* can help by providing context.

Halliday’s idea that context supports gaining new knowledge corresponds to Krashen’s input hypothesis. Krashen asserted that comprehensible input supports learners in learning new information. He argued that incidental learning through reading supports vocabulary acquisition and spelling acquisition via the input hypothesis; that people “acquire language by understanding messages or by receiving ‘comprehensible input’” (Krashen, 1982, 1985). He explained it as: “input must contain $i + 1$ to be useful for language acquisition, but it need not contain only $i + 1$. It says that if the acquirer understands the input, and there is enough of it, $i + 1$ will automatically be provided. In other words, if communication is successful, $i + 1$ is provided” (Krashen, 1982, p. 21).

Liu (2015) criticized that in this comprehensible input hypothesis, the definition of “comprehensible input” has never been fully provided. Due to the vagueness, some researchers

gave a range of definitions for “comprehensible input” (Liu, 2015). Lightbown and Spada (2006, p. 37) gave a definition for “i” as “‘the level of language already acquired’ and +1 as ‘a metaphor for language (words, grammatical forms, aspects of pronunciation) that is just a step beyond that level’” (Liu, 2015, p. 142). Liu cites Krashen as follows:

We progress along the natural order (hypothesis 2) by understanding input that contains structures at our next ‘stage’--structures that are a bit beyond our current level of competence. (We move from i, our current level, to i+1, the next level along the natural order, by understanding input containing i+1;)
(Krashen, 1985, p.2) (as cited in Liu, p. 141)

Liu states, “according to Krashen (1985, p.2), the unknown structures are acquired with the help of contextual information” (Liu, 2015, p. 141). Although this hypothesis mainly discusses acquisition of speech and grammar, comprehensible input does not limit itself to this but also applies to vocabulary acquisition through reading multimodal texts that present image with text. I claim that this comprehensible input and noticing is the very context that *manga* provides to its readers. When the images in *manga* provide context and the unknown words are co-presented with that context, learners’ “realization” occurs, and learning is accomplished. Liu claims that comprehensible input is essential in SLA, but it is not sufficient for explaining all of a learners’ acquisition of a second language. Additionally, to promote a deeper processing, Swain (2000) suggested the necessity of “comprehensible output.” Through comprehensible output, learners’ language production promotes “noticing.” Learners do so by producing sentences either by speaking or writing, to test whether they are using the language with the right meaning at the right time (Liu, 2015). In Swain’s output hypothesis, by a deeper processing through production of language, learners go through the process of “noticing.” In reflecting back on the multimodality of *manga* and Halliday’s SFL, *manga* provides context that makes it clear who all are engaged in the act of speech (tenor), the main message of the conversation (field) and

whether the text is a conversation or a monologue (mode). When the context is clear (comprehensible input), readers of *manga* can explore the rest of unknown parts of the language such as unknown vocabulary (+1).

2.2.2 Noticing Theory and Learning Vocabulary

When learners reflect and find the gap between the comprehensible input and the new information, realization and noticing occur. The “Noticing hypothesis” was first introduced by Schmidt (1990). Schmidt stated that learning occurs by noticing (Moradan & Vafaei, 2016). Schmidt raised the importance of consciousness and claimed that it is “a necessary condition for one step in the language learning process” (Schmidt, 1990, p. 131). Schmidt situated “consciousness as awareness” as the one seen in second language acquisition (SLA) studies. Within the three levels of this “consciousness as awareness,” “noticing” plays an important role in SLA (Muraoka, 2012). According to Muranoi (2006), language acquisition takes the process of noticing, comprehension, intake, and integration (Ellis, 1994, 1997; Gass, 1997; Skehan, 1998; as cited in Muraoka, 2012). If no noticing occurs, then comprehension, intake and integration cannot occur. Noticing is the first step of learning and is the first step for establishing long-term memory (Muraoka, 2012). Raising awareness of noticing has four steps: input, output, task, and interaction (Muraoka, 2012).

Within the first step, input method, there are two factors. One is frequency—when learners are exposed to certain sentence structures frequently, learners have a higher possibility of noticing a particular rule (Schmidt, 1990). The second factor is perceptual salience, and awareness of a particular sentence pattern. It is likely that learners will not notice less salient grammar items because they do not notice the rule unless it is pointed out explicitly (Muraoka, 2012).

The second step to raising awareness of noticing is to engage students in output. It is particularly recommended to engage students when shifting from semantic processing to syntactic processing. By going through this process, students will need to be involved in the function of language. Students will be more aware of the function of language by processing sentence meaning into sentence function. For example, if students learn the meaning of a word, students should engage in an output activity such as creating their own sentences using that word. Swain (1998) particularly emphasized this output activity, stating that learners “notice the hole” in their knowledge in addition to going through the experience of not being able to express oneself in the target language (Muraoka, 2012).

The third step is to engage students in tasks. The task should be meaningful, engage with the real world, involve a communication task and be of moderate difficulty based on the proficiency of the students.

The fourth step is interaction, particularly a type with negotiation of meaning (Muraoka, 2012). This negotiation of meaning occurs more when there is a possibility of miscommunication. In communication, interlocutors need to check each other’s understanding and determine whether the request was clear. There will be more “noticing” occurring when difficulties in the interaction arise (Muraoka, 2012).

This interaction corresponds to multimodality and Halliday’s claim of context and realization, involving interaction with multiple modes and readers. Considering the above information about the comprehensible input and the noticing hypothesis, reading *manga* will force readers to go through a constant negotiation of meaning between the text and image within their known knowledge and the context. Reading *manga* involves a series of interactions. During the time readers engage in multimodal reading, readers notice the intertextuality among different

modes. Readers of *manga* infer unknown words from the given context, interact with the text, and compare the information provided by the different modes. Readers' connecting the dots provides comprehensible input and noticing occurs.

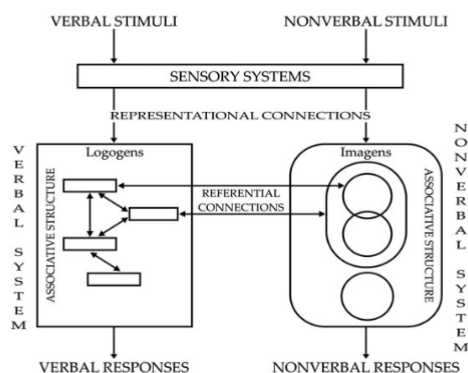
2.3 Retaining Vocabulary

As can be observed, *Manga* is clearly multimodal material. According to Jewitt (2014), multimodality does not involve cognitive psychological approaches that explicitly focus on the internal notions of mind and cognitive process. Dual Coding Theory (DCT) does, on the other hand, consider human cognition and how people process the information of images and text simultaneously.

2.3.1 Dual Coding Theory

When people read *manga*, they process the information of texts and images simultaneously. To fully address the thought process of learners when they exposed to images and text in parallel, Dual Coding Theory (DCT) should be discussed to explain the effects of images on text comprehension. DCT was developed by Alan Paivio in the 1960s and it was used to study human cognition systems that are comprised of two separate coding systems called logogen (verbal system) and imagen (non-verbal system such as visual, auditory, and haptic inputs). These two separate systems are of a verbal and nonverbal variety and are indicated in the following figure. (See Figure 2.5).

Figure 2.5 Structure Model of Dual Coding Theory (Paivio, 2014, p. 43)



This theory indicates that these two systems exist independently but interact with each other, and the logogen makes meaning by making connections with the imagen. DCT can explain how images that appear in *manga* assist learners with their understanding of the text and of how images enhance learners' long-term memory of a particular vocabulary that appear in *manga*. According to Paivio, human cognition depends on the ways these two systems interact. He stated, "Words or phrases can be verbally associated with other words or phrases such as synonyms, antonyms, or paraphrases. Words and phrases can be connected to nonverbal units as well, as when mental images spontaneously occur in reading words, sentences, or longer texts describing scenes and events" (Sadoski & Paivio, 2013, p. 4). According to this theory, when people read a text, the textual information is activated and interacts with mental imagery (or other modalities) as one's cognition occurs. Both logogens and imagens are independent. However, verbal information can evoke imagery, and nonverbal information that involves any perceptual input can evoke verbal information. If people process text with images that appear in *manga* in the way that DCT explains, reading *manga* and negotiating the meaning of unknown words with the images should assist learners' acquisition of vocabulary.

DCT especially emphasizes the embodied nature of cognition and does not constitute abstract mechanisms (Sadoski & Pavio, 2013). The "embodied nature" in this case means that

human cognition occurs via the bodily or “sensory nature of experience and learning” (Sadoski & Pavio, 2013, p. 5). This standpoint asserts that human cognition or learning arises from the experiences because of the perception due to the bodily and sensory capacity, and this view resembles Piaget and Hebb's perspective of constructivism (Sadoski, 2013) (Sadoski & Paivio, 2013). If we use DCT to analyze picture-language effects in multimodal learning, it is speculated that *manga* will have an advantage for processing text and picture information. This claim aligns with multimodality research in which learners enhance their learning by accessing and engaging with multimodal materials (Halliday, 1989; Kress & van Leeuwen, 2006; Jewitt, 2014; Jewitt, Bezemer, & O'Halloran, 2016). In addition, DCT hypothesizes that a learner who is exposed to images and vocabulary at the same time remembers vocabulary significantly better than the group who memorized the vocabulary through translation exercises (Paivio & Desrochers, 1980; Paivio, Clark & Lambert, 1988). The current study builds upon previous studies and tests whether college learners of Japanese will see a benefit in their vocabulary acquisition by reading *manga*.

Memory is one of the most important adaptive functions for human survival and evolution—in order to be able to apply newly encountered events to learning, to assess future outcomes, and to convey important information to others, we need to remember past occurrences. Vocabulary acquisition, in terms of second language acquisition, refers to learners' long-term memory. Previous studies by DCT examined learners' retention of vocabulary. With this in mind, this study considers how two different texts impacted participants' vocabulary retention two weeks after the initial exposure.

Manga can provide the visual cues that learners need for meaning-making of new vocabulary. The story in *manga* is described in the panel-to-panel progress while the text gives

details to further explain the story. Pictures in *manga* supplement the readers' understanding of the text and contextual narratives, and I hypothesize that regular reading of *manga* will build incidental vocabulary and reduce the challenges that learners face due to a lack of cognates. Cognition is more active when one sees the learned vocabulary simultaneously with a visual image in *manga* as predicted by Dual Coding Theory (Paivio, 2014). In this case, the text presented has an intertextual relationship with the images in *manga*. Readers of *manga* process the context provided by the pictures, process the text and the image information simultaneously, and compare and examine the meaning-making process. Due to affordance within each mode, JWL readers may not always make correct meanings, however, it is speculated that they constantly revisit the intertextuality and test their understanding.

As seen, *manga* presents text and image information multimodally. Readers of *manga* negotiate meaning-making by comparing information from the text and the image. *Manga* is a series of multiple still images that a reader uses to go back and forth and compare the text and image information, speculating on its meaning and reflecting on its context, all at their own pace. In comparison, this is different from other media such as movies which continue at a set pace regardless of a learner's ability to comprehend meaning.

Many previous studies support the idea that this negotiation of meaning engages students in deeper processing of information which leads to better vocabulary learning (Hulstijn, 1992; Paribakht and Wesche, 1997; Laufer and Hulstijn, 2001; Nation, 2022).

2.3.2 Involvement Load Theory

Involvement Load Hypothesis (Hulstijn, 1992) is another theory that could explain the mechanism of incidental vocabulary learning through reading. Laufer and Hulstijn (2001) later attempted to summarize prior studies on incidental vocabulary acquisition and proposed the

Involvement Load Hypothesis. Hulstijn (1992) found that learners who were instructed to infer the meaning of unknown words from context retained the words better than when they were supplied with synonyms of the words (Laufer & Hulstijn, 2001). Luppescu and Day (1993), and Knight (1994) found that students who used dictionaries to look up unknown words in a text performed better than students who did not use dictionaries (Laufer & Hulstijn, 2001). Hulstijn et al. (1996) found that students who searched for meanings in dictionaries during a reading task performed better than students who had the words provided in the glossary section (Laufer & Hulstijn, 2001). Paribakht and Wesche (1997) claimed that students retained vocabulary better when they practiced the words in a series of exercises than when they inferred meaning from context (as cited in Laufer & Hulstijn, 2001). Newton's (1995) study indicated that students who engaged in negotiation of meaning (requests for clarifications, or confirmation checks) remembered negotiated items better than non-negotiated items, even though learners simply observed the negotiation (as cited in Laufer & Hulstijn, 2001). In Cho and Krashen's (1994) study, the results demonstrated that dictionary use and a self-imposed task (writing the words with example sentences) enhanced vocabulary learning more than by reading alone (Laufer & Hulstijn, 2001).

Laufer & Hulstijn (2001) argued that tasks that are superior in vocabulary retention are so because they require a “greater depth of processing; better, more intense quality of information processing; degree of elaboration; quality of attention; richness of encoding” (Laufer & Hulstijn, 2001, p. 12). Based on the above findings and their observations, they proposed the Involvement Load Hypothesis (ILH). There are three assumptions made on the determining factors used relevant to vocabulary retention, and these assumptions are explained below.

The first assumption is “[r]etention of words when processed incidentally, is conditional upon the following factors in a task: need, search, and evaluation” (Laufer & Hulstijn, 2001, p. 14). These three factors (need, search, and evaluation) are identified as “involvement” and this involvement is considered to be a “motivational-cognitive construct” (Laufer & Hulstijn, 2001, p. 14).

- The “need” factor is the “motivational, non-cognitive dimension of involvement” (Laufer & Hulstijn, 2001, p. 14), and it relates to a learners’ desire or “need to achieve”—indicating that successful learners have a positive desire to comprehend the text, and this “need” is “strong when imposed on the learner by him- or herself” (Laufer & Hulstijn, 2001, p. 14).
- The second factor, “search” describes the attempt to find the meaning of an unknown L2 word by use of dictionaries or by asking the teacher.
- “Evaluation”, the third of three factors, is a “selective decision based on a criterion of semantic and formal appropriateness (fit) of the word and its context” (Laufer & Hulstijn, 2001, p. 15).

This process corresponds to Halliday’s concept of realization, Schmidt’s Noticing Hypothesis, Krashen’s Comprehensible Input and Nation’s idea of inference. Successful vocabulary learning occurs when learners infer the meaning of unknown words using the context (comprehensible input) found in the text they are motivated to read (need). Such action (search) is activated during inference. Learners come to selective decisions (realization/noticing) through interacting with multiple modes and by negotiating meaning (evaluation). Nation (2013) states:

The strategy of guessing from context involves the use of context clues, background knowledge and common-sense to guess the meaning of unfamiliar words met in reading

and listening. The skills and conditions needed for guessing from context are the same skills and conditions needed for reading with good comprehension (p. 403).

This statement is aligned with Halliday's concept of context of culture (background knowledge) and context of situation. Nation (2001) also confirms that "inferring vocabulary meaning from context...is an essential strategy for developing reading comprehension and promoting lexical acquisition" (p. 240).

The second of three assumptions is "[o]ther factors being equal, words which are processed with higher involvement load will be retained better than words which are processed with lower involvement load" (Laufer & Hulstijn, 2001, p. 15). The more engaged a learner is in processing the learning of that word, the better the retention. An example for the second assumption is if a glossary of new words is provided, then learners do not have to go through the effort of looking them up in a dictionary and searching for meanings. This will create a lower involvement load and learners will not necessarily retain the meaning of the word long term.

The third of three assumptions is "[o]ther factors being equal, teacher/researcher-designed tasks with a higher involvement load will be more effective for vocabulary retention than tasks with a lower involvement load" (Laufer & Hulstijn, 2001, p. 17). This assumption implies that teachers or researchers can modify their pedagogical plan to enhance a learners' involvement load.

In summary, Laufer and Hulstijn indicated that the extent to which learners are involved with a task determines the level of retention of the vocabulary. By referencing these three hypotheses with the previously mentioned studies, high-involvement-load tasks yield better performance on vocabulary retention. Learner motivation, task complexity and effective pedagogy all affect learner retention of new vocabulary. Their claim indicated that, if learners are motivated to learn a language, they will show a strong need to achieve and show strong

involvement levels in the material. This fact reflects back to the fact that college learners of Japanese often have strong motivations to learn the language due to an interest in Japanese popular culture, specifically *anime* and *manga*. This reflection illustrates the potential for *manga* as a classroom reading text. When a learner's involvement with the text is high, teachers can maximize student learning by creating learning material that requires strong evaluation and in such cases that requires high decision-making to choose precise collocations of the new word.

2.4 Vocabulary Learning

We have looked at the nature of multimodality, how it relates to the structure of *manga* and other theories that support *manga's* multimodality, context building nature, and vocabulary acquisition. This section of literature review delves into vocabulary learning in world language classroom and the use of multimodality in vocabulary acquisition.

2.4.1 Historical Shift of Language Teaching Approach and Vocabulary Teaching

Ketabi & Shahraki (2011) pointed out that while vocabulary teaching in the field of second language acquisition had been ignored for many years, over the past three decades it has become one of the most debated topics in the field of SLA teaching. Similarly, language teaching trends have changed over recent years and along with that the approach for how we teach vocabulary in the classroom has also changed in this timeframe (Ketabi & Shahraki (2011).

Past research suggests that most vocabulary instruction depended primarily on each learner's effort (Cohen & Macaro, 2007; Mizutomo & Takeuchi, 2009), however, in late 1980s there was a movement toward how teachers can more effectively teach vocabulary (Cohen, 1991; Cohen & Macaro, 2007; Gu, 2003; Ketabi & Shahraki, 2011), taking the discussion in two major directions. These are explicit instruction and incidental learning. Hunt and Beglar (2002) claim to combine the two approaches in addition to strategy training. They suggest that it is difficult to

successfully guess the meaning of the unfamiliar words from context alone. For successful guessing, unfamiliar words should constitute about 5% of the text and more proficient learners can benefit from learning vocabulary through contextual guessing. Therefore, teachers should instruct learners in the five-step strategies for inferring words from contexts (Nation & Coady, 1988), as well as strategies that can help them retain that information. According to Hunt and Beglar (2002), the best practice for learning vocabulary is to engage in strategic learning after incidental learning.

2.4.2 Vocabulary Learning Studies and Multimodal Resources

Aghaei and Goughani (2016) conducted a quantitative study that investigated whether multimodal pedagogy helps learners of English retain vocabulary for a long time. The experimental group learned vocabulary with the multimodal approach using items such as online dictionaries, pictures, animated slides, gestural presentations, auditory and special semiotic modes that provide contextualized information. The control group learned the same vocabulary with traditional methods such as English glossaries or regular dictionaries. Both groups had 10 sessions with immediate multiple-choice vocabulary testing and again three weeks after their session. They claimed that multimodal pedagogy helped with long-term retention of vocabulary, with results significantly better than the control group. This is aligned with Paivio's DCT, which suggests that learners retain information better when they are exposed to text and image information at the same time.

Başal et al. (2016) conducted a quantitative study that investigated whether graphic novels help college learners of English as a foreign language learn idiomatic expressions. The study indicated that the experimental group learning 40 figurative idioms via graphic novels performed significantly better on their post-test than did the control group. The results of this

study are in line with the Input Hypothesis, which suggests that learners need to access information they can comprehend in order to be able to learn new material.

Tabatabaei & Shams (2011) conducted a quantitative analysis of vocabulary learning on 60 Iranian junior high school students studying English as a second language. The study found that the mixed-gloss group significantly outperformed the other two gloss groups on their production task. These findings support the previous studies of Al-Seghayer (2001), Chun & Plass (1996), Yeh & Wang (2003) and Yoshii & Flaitz (2002) that “a combination of textual and pictorial glosses was more beneficial to the learners in vocabulary learning, possibly due to the fact that they received two modes of input (Ellis, 1994), namely verbal and visual” (Tabatabaei & Shams, 2011, p. 723). In summary, Tabatabaei and Sham’s study concluded that better comprehension of computerized reading passages and vocabulary learning occur when both channels (verbal and visual) are engaged (Tabatabaei and Shams, 2011, p. 723). This finding aligns with Paivio’s claim on DCT that the groups who were exposed to image and text at the same time retained vocabulary better than the groups who engaged in translation exercises (Paivio & Desrochers, 1980; Paivio, Clark & Lambert, 1988).

Various studies have explored the effectiveness of glosses on incidental vocabulary learning for world language learners (Cf. Kost, Foss & Lenzini, 1999; Yeh & Wang, 2003; Plass et al, 1998; Yoshii, 2006 as cited in Moradan & Vafaei, 2006). These studies concluded that the group that had a combination of text and picture gloss outperformed the group with text-only gloss.

Farias, Obilinovic & Orrego (2011) explored multimodality through cognitive science. The authors discussed various literature that dealt with vocabulary learning in texts. Although the terminology used is not all the same, literature on the topic confirmed that multimodal material

in the classroom supports learners' "noticing"; more specifically, learners are aware that they are taking in knowledge when they acquire it via meaningful multimodal inputs with text and visual information (Schnotz & Baadte, 2008). The authors were particularly interested in lexicon development (vocabulary learning) through reading and written production. They also wanted to see how lexicon items are retained in the field of foreign language learning.

Farias, Obilinovic, Orrego and Gregersen (2014) conducted a quantitative study on vocabulary learning in an EFL classroom. Three groups of participants read different text types and their retention of vocabulary was measured. The results showed that the group who read the text with narration and still images retained vocabulary significantly better than the text with narration group that lacked images. The results of the students' Questionnaire revealed that the group who read text with narration and still images gave higher value to the images that contributed to their understanding of the vocabulary. In the study, the fact that the still image group performed significantly better than the text and video group in the transference test should be noted. *Manga*, as still image with text, has a potential as learning material to develop one's vocabulary, and this article aligns with my research interests.

Peker, Regalla, Cox (2018) conducted a quantitative study on vocabulary learning for pre-kindergarten students learning French as an additional language. This study investigated second language learners' vocabulary learning from multimodal input. The key point in this article was that they tested whether a context-building activity helped a learners' memory of vocabulary. They concluded that mere repetition does not really help with vocabulary learning; rather, they suspect that students discover some level of context about the meaning which has a more positive long-term effect on memory. This implies that learners may need comprehensible input for learning.

In summary, this section has explored quantitative studies that dealt with vocabulary learning using multimodal materials in world language classrooms. Some studies delved into the effectiveness of glossaries with text and images (Chun & Plass, 1996; Tabatabaei & Shams, 2011; Al-Seghayer, 2001; Yoshii & Flaitz, 2002; Yeh & Wang, 2003), and the results of these studies indicated the advantage of image and text glossaries. Some delved into the effectiveness of multimodality in long-term retention of vocabulary (Aghaei & Goughlani, 2016; Başal et al., 2016; Farias, Obilinovic, Orrego & Gregersen, 2014), and the results confirmed the advantage of multimodal materials in vocabulary learning. The results of Başal et al. (2016), Aghaei & Goughlani (2016), Farias, Obilinovic, Orrego & Gregersen (2014) suggest the importance of comprehensible input. Learners need to access context that assists with the inference of unknown vocabularies. Aghaei and Goughlani's study (2016) aligns with Paivio's DCT, indicating that accessing both image and text is beneficial for learners' long-term retention of vocabulary. All of these studies suggested the advantages of multimodal materials in vocabulary learning and supported the conclusion that learners achieve better understanding by interacting with multimodal materials and negotiating meaning. If this is a useful step to learn new vocabulary efficiently, it poses the potential that *manga* can also be beneficial for vocabulary learning. Although quite a few studies have investigated the use of multimodal glossaries, no studies were found that dealt with the effectiveness of *manga* in vocabulary learning.

2.5 Manga as an Educational Resource

Due to how students' learning styles have changed, teachers understand that they should bring non-traditional texts into the classroom but are unsure how best to implement their use (Bazalgette and Buckingham, 2013). Bazalgette and Buckingham also criticized that in

multimodality theory researchers should expand their understanding of text to include all its various forms.

As mentioned earlier, *manga* is under-utilized in Japanese language classrooms. Most previous studies are related to learner motivation or related to how teachers utilized *manga* in the classroom. *Manga*'s counterpart in the West is graphic novels (GN), and graphic novels are also underutilized in the classroom even though they motivate youths to read. This section reviews literature that explores the reasons for the low use of *manga* (or graphic novels) in the classroom, and the section explores their potential in world language classrooms. In this literature review section, the term GN and *manga* are both used. *Manga* refers specifically to the Japanese style of GN, while the term GN refers to a larger category that includes all types of image-based novels. The distinction is made due to the differences seen in their panel-to-panel progress and their reflection of the discourse unique to each language (McCloud, 2008).

Not all researchers or educators support the use of GN. They claim that GN readers are too dependent on visual information (Hansen, 2012), that GN are targeted at children and remedial learning (Galman, 2009), and that GN are unsophisticated or are mere entertainment (Rapp, 2011). Since Wertham's (1955) criticism in "Seduction of the Innocent" accused GN having a negative influence and causing juvenile delinquency (as cited in Norton, 2003), there has been some skepticism among some educators, administrators, and parents about the use of GN in education. However, Meek (1992) argued that GN do have some educational value (cited in Norton, 2003). Implementing GN in instruction is still a new field, and many researchers and educators are conducting more research to uncover GN's educational value.

2.5.1 Impact of GN and *Manga* on Learning in Secondary Education

2.5.1.1 Motivation: Sense of Ownership and Sense of Connection

Despite the criticism, numerous studies have explored the relationship between GN and learner motivation and many of those studies have observed a positive relationship between GN and motivation in the secondary education classroom. Learners showed a strong ownership and high level of engagement (Rapp, 2011, Norton, 2003, Bitz, 2004).

Norton (2003) conducted qualitative research on elementary school children's literacy activity outside of the classroom. Norton argued that due to this sense of control, by reading GN out of self-interest, "the student can construct meaning, make hypotheses, and predict future developments" (p. 142). This activity supports functional, cultural, and progressive literacies and therefore implementing similar extensive reading activities has recently gained popularity.

Rapp (2012) stated that in the literacy activity, "[u]nderstanding what we read requires identifying the letters and sounds that make up words, determining the underlying concepts those words convey, relying on grammar to determine how those concepts fit together, and drawing inferences that go beyond what's explicitly stated in the text" (p. 64). GN provide similar activity to understanding what we read because of the characteristics of GN having graphics and text presented together. The fact that readers actively engage in reading and learning the meaning of words, that they can connect the dots between the meaning of the text and the included images, and that they can understand things behind the scenes, means that they are developing a literacy skill. Rapp states, "Comprehending comics requires integration of text and pictures, presented simultaneously, to account for ideas and events depicted in panels. This integration has important benefits for learning" (Rapp, 2012, p. 64) and connects to Halliday's claim that multimodality is not just a combination of different modes but something that goes beyond it. This integration

aligns with Halliday's term, "realization" (1999). Realization, according to Halliday, means "a semiotic relationship: one that arises between pairs of information systems, interlocking systems of meaning" (p. 15). This idea is also in line with Noticing Hypothesis (Schmidt, 1990) and Comprehensible Input (Krashen, 1982, 1985). Readers of multimodal text (i.e., *manga*) go through the same process of integration as readers of regular literacy activities.

In addition to language arts classrooms, there are many research projects done on the advocacy of using GN in other subject areas. Persepolis is one of the popular GN that are used in history classrooms. Harris (2007) presented detailed lesson ideas using Persepolis across the curriculum including history, social studies, and language arts. Galman (2009) stated GN displayed a "productive cultural lens" and even stated they are legitimate for use in education. For example, MAUS by Spiegelman (1986, 1987) dealt with the Holocaust narratives and established its status separate from conventional comics. MAUS presented historical and social stories with visual texts that exceeded the capacity of text-only reading.

As discussed earlier, the interest in Japanese popular culture among American youth has drastically increased compared to just three decades ago. Using popular culture in the classroom can raise motivation, and especially provide a sense of connection to the material. Toku (2001) stated the storytelling aspect of *manga* is a big draw for young readers: "the complexity and drama of the story is the reason young people are strongly attracted to *manga*" (p. 14). The interesting storylines within *manga* draw young readers to want to discuss the development and the characters in the story. This is an important way to grow one's literacy. The fact that *manga* represents many different genres gives readers the opportunity to "pick-and choose" GN that are most connected to their interests. Because the visual presentation with the text information is a

strength of GN and *manga*, the pictures presented in *manga* help overcome the challenges of reading complicated storylines.

In summary, the sense of ownership in the reading material and the sense of connection to the reading helps to maintain motivation. If learners develop a strong sense of ownership to a particular GN or *manga* and find content that appeals to their interest, they can maintain their motivation and overcome the challenge of reading difficult material.

2.5.1.2 Potential of GN and *Manga* as Educational Resources

Krashen (2004) discussed comic books' readability scores. Despite the skepticism that GN only use simple vocabulary and sentence structures, the results showed the opposite. Among the best-selling comic books in 1974, the readability scores ranged from grade 6 to grade 10 (Schulze 1976, cited in Krashen 2004). Krashen demonstrated how some Marvel comics contain complex sentence structures and high-level vocabulary. This shows that not all comic books and GN are simple and contain simple vocabulary and simple sentence structures. GN do not necessarily provide only low-level vocabulary and sentences throughout, rather, they provide challenges with comparable and grade-level appropriate sentence structures.

2.5.1.3 Graphic Novels' Impact on Learning in Foreign Language Classrooms

Several studies indicate that GN assist English language learners (ELL) and foreign language learners (FLL) in their understanding of the target language. Carter (2007) drew special attention to the need for research on ELL's English learning through GN. Carter stated that Liu (2004) reported that low-level ELL who were exposed to a high-level text with visual aids "scored significantly higher than the low-level students receiving the high-level text only" (Carter, p. 6). Liu (2004) supported Dual Coding Theory in which words and pictures presented

together caused students to better recall and produce what they learned (Carter, 2007). Cary (2004) proved GN's effect on the TESL/TEFL population by successfully using GN as scaffolding devices (Carter, 2007).

Bitz (2004) and Norton (2003) both found that elementary school children especially benefited from using GN. Bitz stated, "[T]he children with limited English proficiency benefited most in this project and they engaged in far more writing than in any other assignment" (2004). Norton found that the pictures in comic books are especially helpful to ELL to construct meaning out of the texts of GN.

Krashen introduced the autobiography of Mark Mathabane, who grew up in South Africa and had limited exposure to English. Mathabane learned to read English through comic books. As a youth who had never owned a comic book before, he read them furtively. By the time he became an 11th grader, his reading proficiency in English was good enough for him to be able to read Pinocchio and Aesop's Fables (p. 170, as cited in Krashen p. 107). This is a clear indication that Mathabane developed his English reading proficiency via independent GN silent reading. Many proficient learners of JWL also state that they read many *manga* as one of their self-study materials. This implies the effect of extensive reading and language learning, as well as the effect of *manga*'s multimodality, does provide context for the text. The majority of studies involving *manga* are associated with extensive reading (Hanabusa & Juhn, 2018; Yoshimura & Sharon, 2017).

2.5.1.4 Summary of GN/*Manga* educational value

Rapp (2002), Hansen (2012) and Galman (2009) discussed the social stigma of utilizing GN in the classroom. In contrast, motivation toward and usage of GN and *manga* among secondary-level learners was supported by Norton (2003), Bitz (2004), Morrell (2002), and Toku

(2001). From the above-mentioned studies, it is obvious that GN have much educational value in language arts, history, social studies and across the curriculum. Harris (2007) and Galman (2009) utilized GN in effective ways in their history and social science classes. Krashen's readability score indicated that the language used in GN contained complex sentence structures and high-level vocabulary. Liu (2004), Bitz (2004) and Norton (2003) support that GN is particularly effective for ELL learners with limited English proficiency. It is speculated that students of a foreign language and ESL learners will benefit most from GN, and yet, not many studies have been conducted on how best to do so. Specifically, it became obvious that few studies had been done on the use of *manga* for literacy development of JWL learners.

2.6 Summary of Chapter 2

In summary, although researchers have recently paid more attention to SLA vocabulary learning, only a very few studies have been conducted in the field of JWL. In addition, students' learning styles have changed drastically over the last three decades. However, vocabulary learning in world language education still lacks a multimodal vocabulary instruction that matches their learning style. Best practices in world language classrooms are starting to pay attention to real-world language use in context, engaging students in deeper cognitive processing, and in producing the language in context. The remoteness of the Japanese language from English and its non-cognate nature makes Japanese a category IV language, the most difficult to learn for native speakers of English (Chiswick, B. & Miller, P., 2004). For this reason, learning Japanese as a world language certainly poses its challenges and makes it ripe for taking advantage of current technological advances and changes in society. Most of the content that students benefit from is multimodal in nature, and prior research showed multimodal material encourages

motivation and support for real language use in context. It reinforces deeper cognitive processing and so learning vocabulary multimodally is a natural fit for vocabulary acquisition.

As mentioned, there are not many studies done on learning Japanese vocabulary in JWL classrooms. The researcher argues that *manga*, as a resource to be used in learning, contains important factors that support learners of the Japanese language, and will outline these reasons here. As Laufer & Hulstijn (2001) explained in the Involvement Load Hypothesis (ILH), need, search, and evaluation are three factors that contribute to the retention of vocabulary through incidental reading. The level of involvement learners hold with these factors determines the level of retention of the vocabulary. For Japanese language learning students, the need is to read *manga* and the strong desire to understand the content motivates them greatly. When these students are forced to search for meaning by comparing the information of the image and the text, their engagement is high. And finally, when readers step through the process of evaluating the information presented by images and text seen in *manga*, they make selective decisions on word meanings based on these comparisons and this evaluation brings about long-term retention of meaning. As illustrated here, the ILH theory provides an explanation for *manga*'s effectiveness in learning vocabulary. ILH corresponds well with Krashen's Input Hypothesis and Schmidt's Noticing Hypothesis. To investigate the extent to which ILH, the Input Hypothesis and the Noticing Hypothesis explain JWL learners' vocabulary learning, a quantitative study was implemented to test learners' vocabulary acquisition by inference through reading *manga* versus using English glossaries.

Manga's ability to build context is supported by the multimodal construction of pictorial and textual information. *Manga* fulfills all the conditions that learners of a world language need to learn vocabulary significantly better than they have previously done. Halliday's SFL provides

for an understanding of the context and system of language to help us understand how language works. In the framework of *manga*, we see that it contains and therefore provides “grammar of visual design” (Kress & van Leeuwen, 2006). Readers of *manga* can negotiate the meaning of unknown words by inferring meaning from multimodal information, or context. With these assumptions made, the purpose of this study was to investigate to what extent *manga* might impact the learning of new vocabulary. The study also explored *manga*’s multimodality to examine the extent to which it supported JWL learners’ understanding of unfamiliar words through the context presented by text and image.

2.7 Theoretical Framework and Study Design

As discussed in Chapters 1 and 2, *manga* is underutilized in JWL classrooms although many learners of JWL are strongly motivated by Japanese popular culture. Previous studies concluded that *manga* (graphic novels) can be an effective educational resource to acquire vocabulary. World language learners benefit from comprehensible input (Krashen, 1982, 1985) when learning new vocabulary, and *manga* provides such comprehensible input through its elements that create context. Readers of *manga* are exposed to many moments of comprehensible input when they interact with the gap between the text and image. This interaction supports one’s inferring unfamiliar words. Inferring unfamiliar words is an effective way to learn new vocabulary (Nation, 2022).

Therefore, the current study has two major pillars that guide its research questions. One is to find evidence that *manga* is effective in terms of providing comprehensible input, and therefore, contexts, that lead learners to better learn unfamiliar vocabulary as claimed in previous research. Multimodality supports one’s learning as learners interact with text and image (both semiotic resources) (Kress & van Leeuwen, 2006; Jewitt, Bezemer and O’Halloran, 2016).

Learners need to access context of culture and context of situation to be able to learn new information (Halliday, 1999). *Manga* provides for the three elements of field, tenor and mode, areas that Halliday claims compose context. Interacting with intertextuality and inferring unfamiliar words reflected by known knowledge (comprehensible input) leads to a noticing moment, and that provides learning (Schmidt, 1995). For Research Questions 1 and 2, multimodality, Halliday's SFT, comprehensible input, and noticing theory will each be used to investigate *manga*'s effectiveness.

The other pillar is to question whether *manga* assists with retention of unfamiliar vocabulary. According to Paivio's DCT (2014), accessing two different systems, verbal and non-verbal, supports one's long-term memory and he states this is what brings about retention of vocabulary. The Involvement Load Hypothesis (ILH) by Laufer & Hulstijn (2001) claims that learning vocabulary is bolstered by the level of the learner's involvement with the material through need, search and evaluation. Paivio's DCT, and the Involvement Load Hypothesis (ILH) by Laufer & Hulstijn (2001) will guide Research Question 3.

3. METHODOLOGY

This chapter discusses the procedures and data collection method used to conduct the study.

3.1 Research Questions

The current study seeks to answer the following research questions.

1. To what extent does *manga* influence one's ability to infer the meaning of unknown words compared to text with an English glossary?
2. To what extent does *manga* influence the speed at which one can infer the meanings of unknown words compared to text with an English glossary?
3. To what extent does *manga* affect the retention of vocabulary over a two-week period as compared to retention using text with an English glossary? (*manga* vs. English glossary)?

3.2 Hypotheses

This study investigates whether *manga*'s multimodal text positively affects the inference of unknown words. The research and null hypotheses in this current study are as follows:

1. Learners of Japanese who are exposed to *manga* (text plus images; no glossary) will infer the meaning of more unknown words than those who are exposed to the same Japanese readings that are presented with an English glossary (text plus glossary; no images).

H_01 : There is no difference in the accuracy rate of vocabulary meaning (meaning detection) between *manga* and English glossary tasks.

H_a1 : The mean in the accuracy rate of vocabulary meaning (meaning detection) differs between *manga* (μ_1) and English glossary texts (μ_2) in the population; $(\mu_1) \neq (\mu_2)$.

2. Learners of Japanese who are exposed to *manga* (text plus images; no glossary) will detect the meaning of unknown words faster than those who are exposed to the same readings with an English glossary (text plus glossary; no images).

H_02 : There is no difference in the speed at which learners infer the meanings of vocabulary words when comparing the *manga* and English glossary groups.

H_a2 : The mean in the time that participants spend in detecting the meaning of new vocabulary differs between *manga* (μ_1) and English glossary texts (μ_2) in the population; $(\mu_1) \neq (\mu_2)$.

3. Learners of Japanese who are exposed to *manga* (text plus images; no glossary) will retain more words over two weeks than those who are exposed to the same reading with only an English glossary (text plus glossary; no images).

H_03 : There is no difference in vocabulary retention between the *manga* and English glossary groups.

H_a3 : The mean in the vocabulary score that participants retain over two weeks differs between *manga* (μ_1) and English glossary texts (μ_2) in the population; $(\mu_1) \neq (\mu_2)$.

This chapter consists of three major parts/component. The first part of this chapter concentrates on the participants, procedures, and instruments for the entire study. The second part of this chapter illustrates the procedure and analysis with regard to the Research Questions 1 and 2. The last part of this chapter discusses the procedure and the analysis of the quantitative data regarding Research Question 3.

3.3 The Participants

A convenience sample of 75 undergraduate and graduate students whose ages were between 18 and 35, were recruited from two different institutions in this study. However, the final sample sizes for RQ 1 and 2 were 42, and for RQ 3 the final sample size was 30.

The participants of this study were students taking a second semester of introductory Japanese as a world language at colleges/universities located in the US. Because a sample of convenience was used, generalizations to other populations should be made with caution.

Institutional Review Board (IRB) applications were submitted to both institutions to ensure that the researcher complied with regulations protecting participants. The consent form (See Appendix A) clearly stated foreseeable advantages and risks, and approved language clarified that participants were free to withdraw at any time without harming their relationship with the researcher.

Participants had studied basic syllabaries of *hiragana* and *katakana*, and started learning some *kanji* (Chinese characters) in second semester classes. Of the two institutions from which participants were recruited, one is a public university that offers a Japanese Major and a Minor. This university will, henceforth, be referred to as University A. University A has a two-year foreign language requirement for Letters and Science undergraduate students. Many students who were taking the course were not Japanese majors.

The other university, henceforth referred to as University B, is a private university located in the US in which Japanese is offered as an elective subject. The university offers a major in East Asian Studies. However, there is no foreign language requirement in this university. Therefore, the majority of students were taking language classes out of their interests in addition to their major subjects.

University A offers the beginning-level Japanese class five days a week. Each class is 50 minutes and students spend a weekly total of 250 minutes in the classroom learning Japanese. University A uses a textbook called *Genki 1*, published by The Japan Times. University B offers the beginning-level Japanese class five days a week. Students spend 50 minutes in the classroom

on Monday, Wednesday and Friday, and 80 minutes on Tuesday and Thursday for a weekly total of 310 minutes. University B uses a textbook called *Nakama 1 and 2*, published by Cengage. The vocabulary items that appeared in this study were not officially introduced to either of the participant groups based on the material covered in the textbook as well as the timing that this study was solicited. All participants were volunteers who were recruited to participate in this study. The announcement was made via Canvas Announcement and the consent form was sent via Qualtrics to those who indicated their interest in participating.

Data collection was conducted over five rounds lasting four weeks each time during the Covid-19 pandemic and the following table (see Table 3.1).

Table 3.1 Data Collection Schedule and Number of Solicited Students

Number of data collection	Period	Location	Class Style	Solicited students	Participants Completing task for RQ 1 & 2	Participants Completing task for RQ 3
1	4/19/2021-5/13/2021	University A	100% Remote	13	7	5
2	5/31/2021-6/25/2021	University B	100% Remote	12	7	6
3	7/12/2021-8/5/2021	University B	100% Remote	15	13	10
4	3/1/2022-3/25/2022	University B	In-person	13	7	3
5	4/18/2022-5/12/2022	University A	In-person	22	8	6
Total				75	42	30

Table 3.1 indicates the time of the data collection, which institution, its class style, the number of participants who were solicited and the number who completed each task. As indicated in Table 3.1, the first round of data collection was conducted with University A. Seven students participated for data collection #1. Seven students participated for data collection #2 with University B. 13 students participated for data collection #3 with University B. Seven

students participated for data collection #4 with University B. Eight students participated for data collection #5 with University A. All data collection was conducted over the internet via a learning management system called Canvas. The researcher taught the group of students who participated in data collection #2, however, the course was complete prior to their volunteering to participate. In order to ensure that participants did not feel unfairly pressured, on the consent form for participating in this study, for all five data collection phrases, it was clearly indicated that participation was completely voluntary, and participants were free to discontinue the study anytime, and their current or future relationship with the researcher would not be affected in any way. The current study was approved by the IRB at both institutions, ensuring that participants have the freedom to withdraw at any time without affecting their relationship with the researcher.

As indicated in Table 3.1, data collection #1, #2 and #3 were done during courses that were taught completely remotely. For data collection #1, the researcher requested colleagues in University A to solicit participation and a resulting thirteen students volunteered to participate in the study. University A was teaching classes remotely during the Covid-19 pandemic, and their Japanese class was also taught 100% remotely. Across the three data collection processes with University B, the level of proficiency of the participants at the time of data collection was approximately the same. This study examined vocabulary that was extracted mainly from Nakama 2 Chapter 3 and later chapters. In all cases, the data collection was completed before any participants were exposed to the selected vocabulary.

For data collection #2, the course that students were taking at the time was delivered entirely remotely. There was no physical meeting between classmates or professor due to the COVID-19 pandemic. However, the class met five days per week via Zoom (an online conferencing software program) and there were asynchronous activities as well. The participants

volunteered after they completed the course which the researcher taught with two other instructors.

For data collection #3, the course that students were taking at the time was delivered entirely remotely during summer. There were no physical meetings between classmates or the professor due to the COVID-19 pandemic. However, the class met five days per week via Zoom and there were asynchronous activities as well. The researcher did not teach this course.

For data collection #4, the course that students were taking at the time was taught in person. The researcher herself taught this course, along with three other instructors. It was reinforced that participants were able to discontinue participating in the study at any time and the relationship with the researcher would not be affected in any way.

For data collection #5, the course that students were taking at the time was taught in person. The researcher did not teach this course but again asked colleagues for assistance in soliciting participants to volunteer their time.

As indicated in Table 3.1, a total of 75 students were recruited in the study, however, 42 participants completed all content across weeks 1 and 2, answering Research Questions 1 and 2. For Research Question 3, 30 participants completed all four weeks of study.

3.3.1 A Priori Power Analysis

Three a priori power analyses were conducted using G*Power version 3.1 (Faul et al., 2007) for each research question. In order to assess to what extent participants can infer the meaning of unknown words when reading two different texts, a repeated-measure t-test was employed. Furthermore, increasing statistical power, a two-period, two-sequence crossover design was implemented (Lim & In, 2021). To determine the minimum sample size required for research question 1, G*Power was run following the manual guidelines (Faul, Erdfelder,

Buchner & Lang, 2021). The results indicated the required sample size to achieve 80% power for detecting a medium effect, at a significance criterion of $\alpha = .05$, was $n = 34$ (see Figure B1 in Appendix B). The participants who completed the task for research question 1 was 42. Therefore, the obtained sample size of $n = 42$ was adequate to test the study hypothesis for research question 1.

For research question 2, the current study investigated to what extent *manga* influenced the speed that participants spent inferring unknown words. To measure the impact of *manga*, the Wilcoxon signed rank test was used. It was appropriate to examine whether there was a difference in median between paired observations (Laerd, 2015). An a priori power analysis was conducted using G*Power. The results indicated that a sample size of $n=35$ would achieve 80% power to detect a medium effect, with a significance level of $\alpha = .05$ (see Figure B2 in Appendix B). Although 42 participants completed the task for research question 2, five participants were identified as outliers. Consequently, the final sample size was reduced to $n=37$, but this remained adequate for the study.

For research question 3, a two-way ANOVA was determined appropriate to investigate whether there was an interaction effect between the two independent variables (text type and time) on a dependent variable (vocabulary score). There were two different text types (*manga* and text with English glossary) and two different points in time (inference and retention). The current study investigated how these two different text types affected the dependent variable (vocabulary score) at two different points in time. An a priori power analysis was conducted using G*Power. The results indicated that a sample size of $n=34$ would achieve 80% power to detect a medium effect, with a significance level of $\alpha = .05$ (see Figure B3 in Appendix B).

Although it was expected that more than 34 participants would take part, many participants did not complete all the tasks. In the end, 30 participants completed all tasks, achieving 75% power.

3.3.2 Proficiency Level of Participants

For University A (study number #1 and #5), the researcher asked colleagues to solicit participation from students. For data collection conducted at University A (#1 and #5), it is noted that the overall level of participants' Japanese study is not the same as with the University B participants. As mentioned previously, course time is 60 minutes less per week at University A as compared with University B. However, both institutions have, for their second semester course, a target proficiency level of between Novice High to Intermediate Low, as determined by ACTFL guidelines. Genki 1 indicates that completing the textbook is on par with A1 of the Common European Framework of Reference for Languages (CEFR), and Nakama indicates that completing the textbook is roughly equivalent to Novice High in ACTFL standards (Nakama, 2015, p. AIE-10). According to "Assigning CEFR Ratings to ACTFL Assessments," A1 in CEFR is equivalent to Novice High in ACTFL (ACTFL, n.d.). The ACTFL Proficiency Guidelines 2012 indicate that:

At the Novice High sublevel, readers can understand, fully and with relative ease, key words and cognates, as well as formulaic phrases across a range of highly contextualized texts. Where vocabulary has been learned, they can understand predictable language and messages such as those found on train schedules, roadmaps, and street signs. Readers at the Novice High sublevel are typically able to derive meaning from short, non-complex texts that convey basic information for which there is contextual or extralinguistic support.

The data collection process itself involves reading Japanese texts either with *manga* images or with an English glossary; all participants should be able to extract some information without the help of a dictionary in order to be able to infer the meaning of a particular word.

At the time of participation, it is assumed that students have reached the Novice High proficiency level. A similar study was conducted by Serrand (2013) with German language students. She reasons that at the second semester of German in university class are expected that they could “understand the context of the short texts given to them for the purpose of this study, as well as to extract information from the broader context of the readings” (Serrand, 2013, p. 59). This confirms that choosing college-level second semester students is useful for examining vocabulary acquisition through reading texts.

3.3.3 Age of Participants

The current study solicited participants aging in range from 18 to 35. The age group is generally defined as “young adult.” The reason for limiting the age range is to avoid data that may be affected by one’s cognitive level. Research question 2 specifically deals with the speed of detecting the meaning of unknown words. Research indicates that we observe a gradual cognitive decline from the age of 30 (UCSF, 2023). The participants from University B were primarily aged 18-22 and those from University A were primarily aged 18-35 with one student who was 36 years old.

3.3.4 Participants’ Mother Language

According to a survey taken before the study, the mother language distribution is as follows (see Table 3.2). Of those who participated in research question 1 and 2, 67% (n=28) of participants self-identified their mother language as English. 9% (n=4) of participants self-identified their mother language as Chinese. 5% (n=2) of participants self-identified their mother language as Korean. 5% (n=2) of participants self-identified their mother language as bilingual Spanish/English. 2% (n=1) of participants self-identified their mother language as bilingual

Hmong/English. 2% (n=1) of participants self-identified their mother language as Polish. 10% (n=4) of participants did not submit a survey.

Of those who participated in research question 3, 73% (n=22) of participants self-identified their mother language as English. 7% (n=2) of participants self-identified their mother language as Chinese. 7% (n=2) of participants self-identified their mother language as Korean. 3% (n=1) of participants self-identified their mother language as Polish. 10% (n=3) of participants did not submit a survey.

Table 3.2 *Demographic characteristics of participants*

Demographic Characteristics of the Participants	RQ1 & RQ2	RQ3
Mother Language		
English	28	22
Chinese	4	2
Korean	2	2
Spanish & English	2	0
Hmong & English	1	0
Polish	1	1
Unanswered	4	3
Total	42	30

3.4 Instruments and procedures

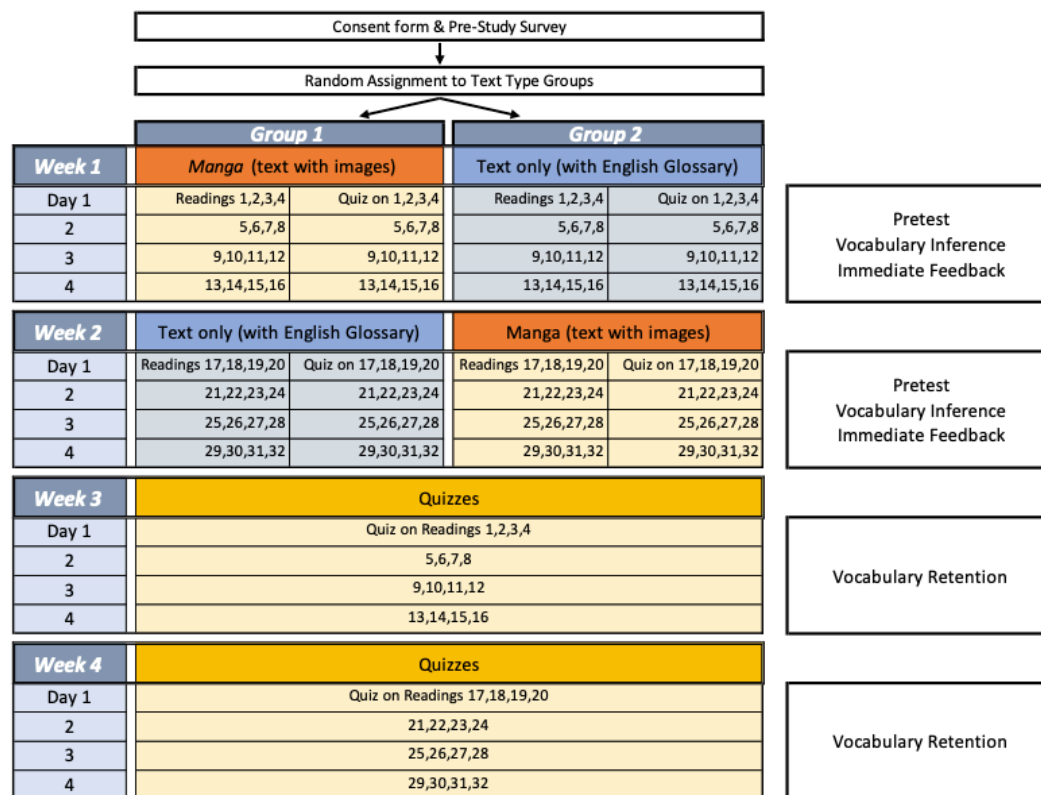
3.4.1 Data Collection

3.4.1.1 Overview

This was a quantitative study implemented with an experimental crossover design. The reason for implementing the two-period, two-sequence crossover design is that it provided the advantage of removing inter-subject variability while also having a statistical high power (Lim & In, 2021). The participants were randomly assigned to two different text type groups, and the groups were switched during the second period (see Figure 3.1).

Figure 3.1

Procedure of the Study Design



The structure of the study was built with two phases in mind. The first phase of the study addressed Research Questions 1 and 2 across the first and second week. This phase investigated the number of words a participant infers correctly and the time it took to complete each task. The second phase of the study addressed Research Question 3 across the third and fourth week. This phase investigated to what extent *manga* enhanced learners' retention of new vocabulary that were introduced and assessed two weeks earlier in phase one. The number of words that participants correctly remembered was measured.

In order to ensure participants were not previously exposed to the chosen unknown words that appeared in the study, all were asked to complete a pretest before weeks 1 and 2. The pretest

consisted of 32 study words and 13 distractor words. The mean score of the pretests were compared using a paired t-test, to ensure that the participants' knowledge of the vocabulary did not differ significantly prior to the data collection stage.

Over the course of each four-week study, all participants read four stories per day, and were immediately quizzed on each in Week 1 and Week 2. In Week 1, participants of Groups 1 and 2 were asked to read 16 stories containing two unknown words each, for a total of 32 unknown words. Immediately after reading, both groups were tested on whether they were able to correctly infer the meaning of those unknown words. Between weeks 1 and 2, groups switched text types. In Week 2, participants of both groups were again asked to read 16 new stories, and again each was tested on their correct inference of the meaning of those 32 unknown words. In Week 3, participants were tested on their retention of the meaning of the first set of unknown words from Week 1. In Week 4, participants were tested on their retention of the meaning of the second set of unknown words from Week 2.

3.4.1.2 Materials Used

All participants used a Learning Management System (LMS) called Canvas, and Canvas was used throughout for data collection. All data collection was conducted using the quiz section of Canvas, by presenting participants with reading texts and follow-up questions.

As mentioned previously, five total rounds of data collection were conducted during the spring semesters of 2021 and 2022. The timing of the study was set for four weeks prior to when participants would have been exposed to the same vocabulary in their classrooms. The vocabulary used in the data collection was extracted from a textbook called "Nakama 2," which University B uses for second semester Japanese instruction. All data collection ended before participants started learning any vocabulary that appeared in the study. University A used a

different textbook (Genki 1), which does not present the majority of the vocabulary that appeared in the study; any vocabulary included in Genki 1, as with University A, was present after data collection for the study had ended.

Most of the words used for this study were transitive/intransitive verbs.

Transitive/intransitive verbs are particularly challenging to learn, and they typically appear in second or in the third semester of most Japanese language education programs at the college level. Therefore, no participants are likely to have had previous exposure. The stories were made to include these unfamiliar vocabulary words. The stories were also designed to use more than 80% familiar words so that participants can readily pick out unfamiliar words.

3.4.1.3 Survey

At the beginning of data collection, participants were asked about their backgrounds such as major, first language, languages they speak at home and whether the participant has lived in Japan. The survey was used to detect that no participants had exposure to the Japanese language beyond the second semester-level proficiency. The survey (see Appendix C) was given using Canvas' quiz function and the answers were downloaded into excel.

3.4.1.4 Pre-test

A pre-test was given to participants before they started reading any episodes. Serrand (2013) conducted a pretest before she studied the effects of image gloss on German learners' vocabulary learning. To assess vocabulary acquisition, it was necessary to determine if participants had previously been exposed to the target vocabulary (Serrand, 2013). Participants took a pre-test to evaluate whether they had any prior knowledge of the target words of the study. This ensured neither group had a significant difference in their vocabulary knowledge.

A pretest was conducted on the first day of Week 1 and another on the first day of Week 2. Each pretest contained 13 distractors in addition to 32 target words for a total of 45 words per pretest. The “distractors” are the words that did not appear in the story or in the questions. These distractors played the part of preventing participants from remembering the target words via exposure to other words (Serrand, 2013). The distractors were also extracted from chapters after Chapter 3 in Nakama 2 third edition textbook.

Participants were asked not to look up any words in the dictionary and not to spend too much time answering whether or not they had seen the word. One point was awarded when they answered the correct meaning of the word. The two groups were compared to see if there were any significant differences among students who had already been exposed to the words.

The following is an example of a pretest.

This is a pretest. Please answer whether you have previously seen the following words. If you don't know the meaning of the word, please **enter a 0** in the column. If you know the meaning of the word, write the meaning of the word in English in the column. Please **do NOT look up** the meaning of any words that appear in this study. Please answer intuitively whether or not you have seen the word. Please don't spend too much time on each question.

Instructions stated that participants input zero when they did not know a definition. For known words, participants were asked to write the meaning of the word in English. All data were collected through Canvas and answers downloaded into Excel files for analysis of correctness. Since distractor words were not relevant to the study, these words were dropped from subsequent analysis. Otherwise, grading was conducted manually for Research Question 1 by the researcher (see Appendix D). The answers were converted into numbers with correct answers receiving one point and incorrect answers receiving zero points. Excel sheets were imported into SPSS v.28.

One thing should be noted for grading criteria. Because some of the vocabulary words had multiple meanings and participants were given no context for inference, some answers were

not counted as correct. For example, in Week 2, Day 4, the word “*ageru*” was present in one question. The word used in this study was “to raise” as in “Kei flies a kite” or “Kei raises a kite.” The word also means “to give something to someone” but since this is out of context with the story that participants read in this study, it was marked incorrect when manually graded if someone happened to provide “to give something to someone” as an answer. Additionally, some participants indicated that they had seen the word but still did not know the meaning. Unless they gave the correct meaning of the word in English (as defined by the final context of the story they appeared in), participants did not receive any points in their pretests. After the grading was complete, and in order to detect any mean difference between the *manga* task and glossary task, a paired sample t-test was run in SPSS Version 28.

3.4.1.5 List of Vocabulary Used in the Study

As mentioned previously, the vocabulary in question were mainly extracted from Chapter 3 of Nakama 2. Most were transitive/intransitive verbs, and some were nouns that appeared in chapters that participants had not yet encountered at the time of the study. The following table (see Table 3.4) indicates all words introduced in this study. All verbs were labeled in their dictionary form.

Table 3.4

List of Vocabulary Used in the Study

	Day 1	Day 2	Day 3	Day 4
Week 1	Question 1: <i>Yaku</i> (to bake) <i>Wareru</i> (to be broken)	Question 1: <i>Osu</i> (to push) <i>Aku</i> (<door> opens)	Question 1: <i>Akeru</i> (to open) <i>Hajimeru</i> (to start)	Question 1: <i>Nokoru</i> (to remain) <i>Machigaeru</i> (to make a mistake)

Question 2:
Oriru (to get down)
Ugoku (to move)

Question 2:
Makkura (pitch dark)
Tsuku (<the light> turns on)

Question 2:
Shimeru (to close)
Yogosu (to make something dirty)

Question 2:
Tamaru (to be piled up)
Kawakasu (to dry something)

Question 3:
Ikisaki (destination)
Tomaru (to stop)

Question 3:
Narabu (<some things> are lined up)
Kimeru (to decide)

Question 3:
Atsumaru (to gather)
Hieru (to be chilled)

Question 3:
Taosu (to knock it down)
Chigau (to be wrong)

Question 4:
Noseru (to take someone on board)
Tsureteiku (to take someone to somewhere)

Question 4:
Horeizai (ice pack)
Hiyasu (to cool something)

Question 4:
Otosu (to drop something)
Yogoreru (to become dirty)

Question 4:
Okane wo orosu (to withdraw money)
Nokoru (something remains)

Week 2 Question 1:
Kawaru (something changes)
Nokosu (to leave something)

Question 1:
Heru (something decreases)
Fueru (something increases)

Question 1:
Wakasu (to boil water)
Tsukeru (to turn on <the light>)

Question 1:
Toreru (to come out)
Ochiru (someone/something falls)

Question 2:
Fueru (something increases)
Mitsukeru (to find something)

Question 2:
Nokoru (something/someone remains in a location)
Shushoku (getting a job)

Question 2:
Waru (to crack something)
Hairu (to enter)

Question 2:
Sagaru (to go lower)
Dasu (to pay money for)

Question 3:
Utsusu (to shift something; to move something to a different place)
Hazukashii (to be embossed)

Question 3:
Nigate (someone is not good at doing something)
Ajisai (hydrangea)

Question 3:
Okosu (to wake someone up)
Tsudukeru (to continue something)

Question 3:
Noseru (to load up)
Owaru (something finishes)

Question 4: <i>Ageru</i> (to raise something up high) <i>Orosu</i> (to get something down)	Question 4: <i>Katazukeru</i> (to put something away) <i>Taoreru</i> (something falls down)	Question 4: <i>Naosu</i> (to correct) <i>Matomeru</i> (to put together)	Question 4: <i>Sobetsukai</i> (farewell party) <i>Kangaeru</i> (to think about)

Two words in each story appeared underlined, and the Canvas quiz feature asked the participants to type in their inference in the blank space provided by Canvas. The task for one day contained four stories to read and eight underlined words whose meaning they needed to infer. The number of vocabulary that participants were asked to handle was determined by Miller's claim that individuals store seven (plus or minus two) items in their working memory. (Miller, 1956).

3.4.1.6 Data Collection for Research Questions 1 & 2

Research Questions 1 and 2 of the study investigate to what extent *manga* assists participants' inference of meaning as compared to traditional texts, which are typically provided with a glossary in the language that the learner speaks. The data collection method delves into the number of words that participants were successfully able to infer as well as the time that participants spent to reach their understanding and click the "submit" button in Canvas.

Reading materials were assigned to them as a part of their daily tasks, separate from their regular class assignments. As described in Table 3.4, a one-week task lasted for four days and participants read four stories each day. Each story was written in *hiragana* and *katakana*. None of the stories contained a single *kanji* as having prior knowledge of *kanji* may have given an unfair advantage to some participants. Due to the ideographical characteristics of *kanji* mentioned in Chapter 2, the use of *kanji* alone could have positively affected one's ability to infer the meaning of the words. All participants read the same story using different styles of text

and answered the question for each underlined vocabulary word. All participants were asked not to use any type of dictionary but to answer intuitively according to the reading assigned to them.

To illustrate, Story 1 of Week 1 is presented in the following, Figure 3.2. The first example is *manga* text (see Figure 3.2) and the second example is English glossary text (see Figure 3.3). In this study, the English glossary text will be referred to as “glossary text.” For all of the actual images and stories, see Appendix E.

Figure 3.2

Example of a Manga Text

Question 1

2 pts

Read the following manga and answer the question.

ホストファミリー1

ARRIVAL II

1

2

3

4

Figure 3.3

Example of a Glossary Text

Question 1	2 pts
At the airport ケイ：はじめまして。ケイです。よろしくおねがいします。 ホストファミリー：こちらこそ、よろしくおねがいします。 ケイ：あれがゆうめいなとうきょうスカイツリーですね。 ホストファミリー：そうそう。スカイツリーはせかいでいちばんたかいでんぱとうだよ。よるのライトアップもきれいだよ。 (glossary) でんぱとう：radio tower At home ホストファミリー：これからいねんよろしくね。 ケイ：はい。よろしくおねがいします。これ、つまらないものですが。。。。 ホストファミリーのおかあさん：なにかしら。 ケイ：ぼくがやいたゆのみです。 ケイ：あーわれてる！もしかしてあのとき。 ホストファミリーのおかあさん：あらー。せっかくつくってくれたのに。ざんねんね。	

To maintain participant motivation, the story surrounds a US exchange student named Kei who is home staying with a host family in Japan. Throughout the stories, Kei experiences cultural aspects of Japan. Kei's race and gender identity were unspecified for the purposes of diversity, equity and inclusion and the name is rather gender neutral in both English and Japanese. All stories were created for the purposes of this study by the researcher. The *manga* format used is a typical *yonkoma*, or four-panel *manga*. Kei's personality is rather clumsy, and the end of each story includes a funny twist as in the four-panel narrative style of 起承転結 (*ki-sho-ten-ketsu*). The *manga* were drawn by a hired student whom the researcher had taught in the past. A rough sketch of each drawing called "*neemu*" (storyboard) was provided by the researcher and was the basis of each drawing. In each panel, characters were drawn as stick

figures and their thoughts and conversations were provided to the artist. Since Canvas presents content sequentially and vertically, the researcher decided to keep a Western format to the four storyboard panels and place them horizontally on the page, rather than in the conventional Japanese style running vertically and right to left. For easier reading, the panel numbers were labeled as 1, 2, 3 and 4. Once the drawings were completed, a different student was hired to insert the prepared text into the talk bubbles¹.

The selection of each student was also a methodical decision. The manga artist was a former student of the researcher. When the student presented her drawings during a class project, the researcher appreciated her art style, which is warm and sometimes whimsical, and felt it would fit well with the style of *yonkoma manga*. The character's name was also decided during a planning meeting. The researcher expressed a wish to have a gender-neutral name that was not only short but easy to remember, and the *manga* artist came up with the name, Kei. Kei is gender neutral, easily associated with the English alphabet letter "K" and happens to also be the first initial of the *manga* artist. The artist also came up with the second character's name, Yui, inspired by the main character of a Japanese drama which had been used in class. She understood well what the researcher was looking for in facial expressions and fine movements which would ensure the reader could make meaning by comparing text and image information. The art and the *manga* artist gave life to this project. Another student was selected for the writing portion and did a fantastic job of inserting the text into the talk bubbles. She was chosen because of her knowledge and experience with Photoshop. She completed this as she did all of her assignments, very efficiently.

¹ Hiring of the two students was funded by Humanities Research Funds.

The first story illustrated the first meeting of Kei and their host family at the airport in Tokyo. At the third and the fourth panel, Kei realizes that the pottery that they had made is now broken. The underlined words in both texts were: *yaita* (fired, baked) and *wareteru* (to be broken). Participants gathered information from the text and images, and inferred the meaning of the underlined words. All underlined words were intentionally chosen in conjunction with the drawings in order to represent the meaning of the words. In this example, the drawing of *yaita* is shown as Kei placing the pottery into the kiln; the drawing of *wareteru* is shown as Kei holding a piece of broken pottery. The context of the story is used to infer the meanings of these underlined words. Following the story, each of the two questions asked the participant to enter the meaning of the word by filling in the blanks. By not providing multiple choice questions, it prevented the correct answer being chosen simply by chance. The story text was identical regardless of format, *manga* or glossary, and the question/answer section also contained the same questions.

Figure 3.2 shows the *manga* text of the first story with its two underlined words. Figure 3.3 shows the glossary text of the first story with its two underlined words. Each story was immediately followed with two vocabulary questions and each participant was asked to infer their meaning before moving to the next story.

3.4.2 Assessment and Intervention for RQ1

3.4.2.1 Procedures

All the data were collected on Canvas, which both institutions used. The grading was conducted manually based on the guidelines that the researcher created (see Appendix D). Each answer was copied into Excel files each day and analyzed for correctness. The answers were converted into numbers: correct answers received one point and incorrect answers received zero points. The excel files were combined as weekly results, and were converted into SPSS v.28.

Canvas allows instructors to input multiple variations of answers as correct, however it is still limited because the answers must be an exact match. In each of the examples, the correct answers for Question 1 are either “to bake” or “to fire.” If left to its programming, when a participant input the word “bake,” Canvas would mark the answer wrong as it was not an exact match for the possible answer “to bake.” To prevent any missed correct answers, the researcher made the decision to manually grade all answers. How the researcher conducted the grading is explained in Appendix D. Regardless of how a participant answered the question (correctly or incorrectly), Canvas was set up to give detailed and consistent feedback equally to all participants. This is clear in the example shown in Figure 3.4.

Figure 3.4 Example of Feedback

Answers:

Show Possible Answers for

Possible Answer:

...

Possible Answer:

...

[+ Add Another Answer](#)

Correct answer comments

やいた is the plain past form of やく (u-verb), and it is a transitive verb, meaning to bake something or to fire something like pottery. In this situation, Kei fired the pottery and made a tea cup.

There are many pairs of transitive/intransitive verbs in Japanese language. Transitive verbs have two agents involved in the action (those who engage in the action and the direct object of that action; as in 私はピザを食べます).

われてる is the casual form of われています. われる (ru-verb) is an intransitive verb (something breaks). Intransitive verbs don't have any direct objects. These verbs are often used to explain that something has occurred; it's as if the object acted on its own. われる, in this situation, explains that the cup just broke and not that anyone broke it.

Wrong answer comments

やいた is the plain past form of やく (u-verb), and it is a transitive verb, meaning to bake something or to fire something like pottery. In this situation, Kei fired the pottery and made a tea cup.

There are many pairs of transitive/intransitive verbs in Japanese language. Transitive verbs have two agents involved in the action (those who engage in the action and the direct object of that action; as in 私はピザを食べます).

われてる is the casual form of われています. われる (ru-verb) is an intransitive verb (something breaks). Intransitive verbs don't have any direct objects. These verbs are often used to explain that something has occurred; it's as if the object acted on its own. われる, in this situation, explains that the cup just broke and not that anyone broke it.

As seen above, when the participants answered correctly, they received their feedback in green. When the participants answered incorrectly, they received their feedback in red. Both sets of feedback were identical. As mentioned, participants were tasked with reading four stories per day containing eight overall questions. One correct answer is counted as one point, and all questions answered correctly gains each person eight points for the day and 32 points for the four-day week. The time spent on each item was recorded automatically by Canvas. The times were recorded in excel files and converted into SPSS files.

3.4.2.2 Scoring Procedures and Analysis for RQ1

As mentioned previously, all answers were graded automatically via Canvas but manually re-graded after the study was completed because Canvas requires an exact match for responses. For example, when students demonstrated comprehension of the story, but did not submit the expected answer, the researcher marked it correct. Therefore, the researcher created tables of all grading criteria (see Appendix D). The tables show which variations were manually marked correct or incorrect by the researcher. All correct answers received one point and incorrect answers received zero point. The grading each day was done on Canvas and downloaded into excel files. In addition, excel files were created and copied all correct and incorrect answers, and later converted into numbers. The downloaded excel file from Canvas were compared with the manually input excel files to ensure there were no errors in the data. The scores for each day were combined to create a score for each participant for each text type. The minimum and maximum potential scores for each text type ranged from 0 to 32 points.

3.4.3 Scoring Procedures and Analysis for RQ2

Research Question 2 investigated the time that each participant spent inferring unfamiliar vocabulary. The time that each participant spent each day was captured by Canvas and combined

for a total time spent for each text type. The time spent is indicated in minutes since Canvas records only in minutes rather than in minutes and seconds. Therefore, participants who may have taken less than one minute were still recorded as a full minute. Additionally, according to Canvas, it rounds some timestamps preventing a truly accurate measurement of time for completion of tasks.

3.4.4 Data Collection Procedure for RQ3

Research Question 3 examined vocabulary retention after two weeks from the initial exposure. The vocabulary tests taken contained the same vocabulary seen in weeks 1 and 2. They were again asked to type in their answers. Again, all participants took the same tests, no matter which text type they originally read two weeks prior. The test only presented questions to ask meanings of the target words and asked the participants answer instinctively without spending too much time on each question. It also asked them to input “0” if they could not remember the meaning (see Figure 3.5).

Figure 3.5

Sample of Vocabulary Retention Test

Question 1	2 pts
Please answer the questions.	
If you cannot remember the meaning, please type 0.	
1. What is the meaning of やく (dictionary form: やく)?	
2. What is the meaning of われてる (dictionary form: われる)?	

The maximum score for each day was 8 points and the weekly points were all combined as one vocabulary retention score for the text type.

3.4.5 Scoring Procedures and Analysis for Research Question 3

The scoring for vocabulary retention for research question 3 was conducted in the same manner as for research question 1. Grading was completed by consulting the grading criteria created earlier by the researcher. All variations that were listed as acceptable answers received one point. Similarly, vocabulary scores received each day were combined to create weekly scores and these scores were labeled as retention scores linked to the text type they had originally read. The minimum and maximum potential scores for each text type ranged from 0 to 32 points.

3.5 Analysis and Measurement

For Research Question 1, the researcher was interested in investigating to what extent participants are able to infer the correct meaning of unfamiliar vocabulary through reading two different types of texts. Therefore, a paired t-test was conducted to detect the mean difference between the vocabulary inference score through *manga* and through English glossary.

For Research Question 2, the researcher was interested in examining the difference in time that participants spent inferring unfamiliar vocabulary through reading two different types of texts. After confirming the times spent by participants were not normally distributed, the Wilcoxon signed rank test, a non-parametric test, was chosen to detect any significant difference in the medians of the time spent reading the two different texts.

For Research Question 3, the researcher was interested in evaluating whether the different text types would affect participants' retention of the unfamiliar vocabulary from the pretest to the inference point and after two weeks. Therefore, a two-way repeated measures ANOVA was conducted to learn whether the text type had any effect on the retention of vocabulary after two weeks.

The data collected over five rounds were copied from Canvas and moved to excel files, where it was converted into an SPSS file for statistical analyses.

4. RESULTS

This chapter will discuss the quantitative results for pretests, research questions 1, 2 and 3. This includes tables and charts from the results of a paired t-test for pretests and research question 1, a Wilcoxon Signed Rank test for research question 2 and a two-way repeated measures ANOVA, an ANCOVA and t-tests for research question 3.

4.1 Pretests

There were 42 participants who completed the pretest and the inference test through *manga* and the text with English glossary. Descriptive statistics for pretest scores (see Table F1 in Appendix F) indicated that the mean vocabulary score before reading *manga* was 3.48 and the standard deviation was 3.68 ($M = 3.48$, $SD = 3.68$) and the mean vocabulary score before reading with English glossary was 3.79 and the standard deviation was 4.36 ($M = 3.79$, $SD = 4.36$).

A paired sample t-test was conducted to determine whether a significant difference existed in pretest vocabulary scores before reading the *manga* and English glossary texts. The results (see Table F2 and Table F3 in Appendix F) did not indicate a statistically significant difference in the pretest score before reading the *manga* ($M = 3.48$, $SD = 3.68$) and reading with the glossary ($M = 3.79$, $SD = 4.36$), [$t(41) = -.9$, $p = .390 > .05$, Cohen's $d = -.134$]. The mean and 95% confidence interval of the difference between means was -0.31 [-1.030 to .411] and did not indicate a difference between the means of the sample. Therefore, it is concluded that there is no significant difference in the pretest scores measuring participants' vocabulary knowledge before reading the *manga* compared to the scores with the glossary.

4.2 Results for Research Question 1: Vocabulary Inference Score between Two Different Texts

The first research question was to detect to what extent these two text types have differences in the accurate vocabulary score of their inference. A paired sample t-test was conducted in SPSS v.28. There were 42 participants who finished the tasks of vocabulary inference through both *manga* and the text with English glossaries. Participants' mean score of vocabulary inference through *manga* was 13.69 and the standard deviation was 6.32 ($M = 13.69$, $SD = 6.32$). The mean score of vocabulary inference through English glossary was 8.71 and the standard deviation was 6.09 ($M = 8.71$, $SD = 6.09$) (See Table F4 in Appendix F).

Prior to the main analysis, assumption testing was conducted (see Figure F1 in Appendix F). One outlier was detected that was more than 1.5 box-lengths from the edge of the box in a boxplot. Inspection of its value did not reveal it to be extreme and it was kept in the analysis. The other assumption testing, Shapiro-Wilk's test of normality confirmed that the difference scores are normally distributed (see Table F5 in Appendix F). By confirming all assumption testing, it is assured that the following results are not biased.

As indicated in Table 4.2 and Table 4.3, the results of the paired samples t-test indicated a significant difference between *manga* and text with English glossary [$t(41) = 6.5$, $p < .001$, Cohen's $d = 1.004$]. The mean and 95% confidence interval of the difference between means was 4.98 [3.43 to 6.52] and indicated a significant difference between the means of the sample. Therefore, it is concluded that the vocabulary inference score through *manga* was significantly better than the text with English glossary.

Table 4.2***Vocabulary Inference Paired Samples Test***

	Paired Differences					Significance			
	95% Confidence					One-		Two-	
	Std.	Std.	Interval of the			Sided		Sided	
	Devia	Error	Difference			t	df	P	P
	Mean	tion	Mean	Lower	Upper				
<i>Manga</i>	4.976	4.956	.765	3.432	6.521	6.50	41	<.001	<.001
Score –						7			
Glossary									
Score									

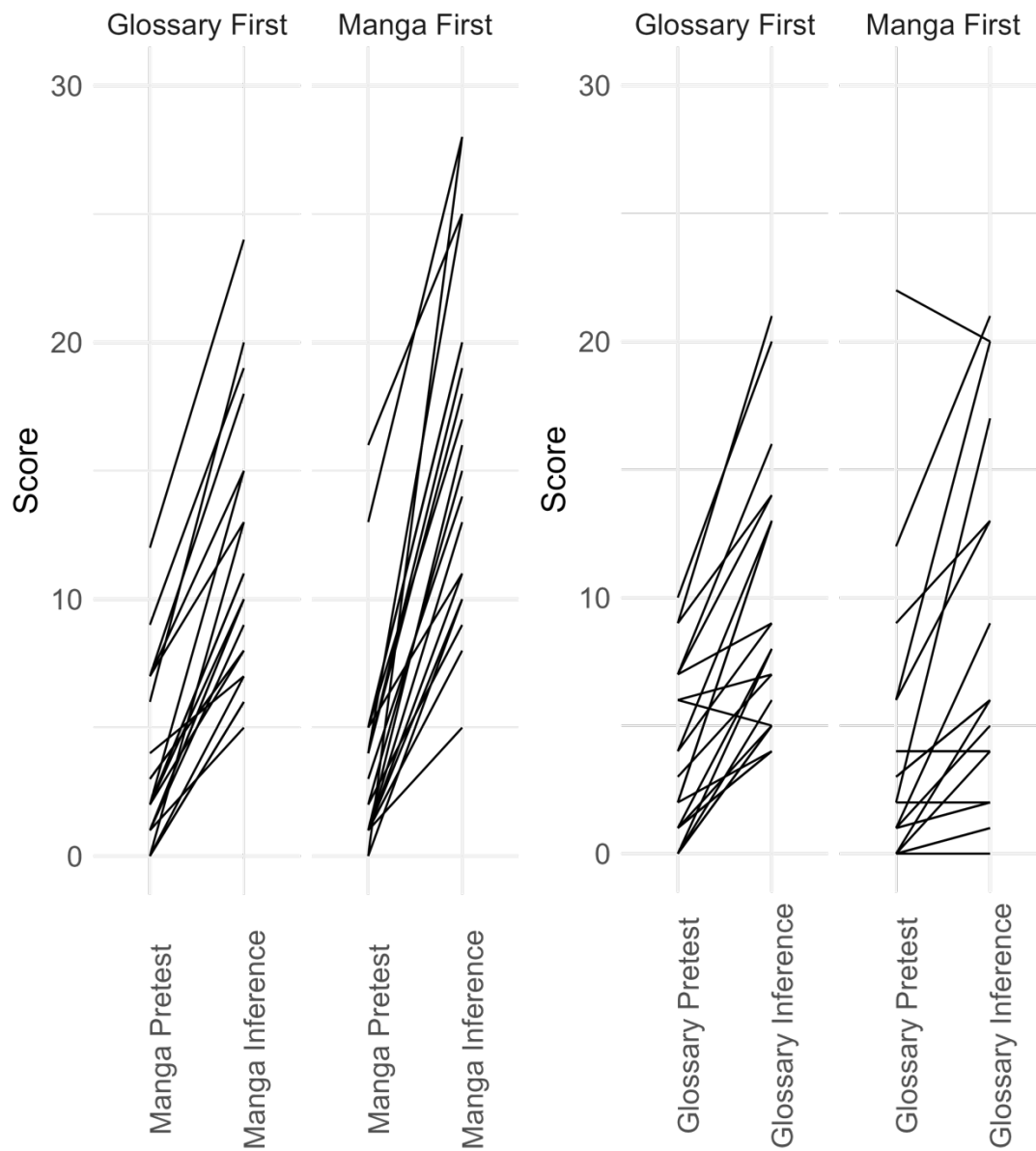
Table 4.3***Vocabulary Inference Paired Samples Effect Sizes***

			95% Confidence Interval		
		Standardizer ^a	Point Estimate	Lower	Upper
<i>Manga</i> Score –	Cohen's d	4.956	1.004	.628	1.372
Glossary Score	Hedges' correction	5.049	.986	.616	1.347

Figure 4.1 indicates the vocabulary score of pretest and inference test for an individual participant (Moore, 2023). As seen, there is a clearer pattern of improvement for the *manga* task, but there are variables for the glossary task. This suggests that participants' inference vocabulary scores uniformly improved when reading *manga* text, but this was not the case when they read text with glossary.

Figure 4.1

Individual Vocabulary Scores: Pretest and Inference Performance²



² T. Moore, provided during statistics consultation, September 29, 2023

4.3 Results for Research Question 2: Time Spent to Complete Two Different Texts

4.3.1 Removing Outliers

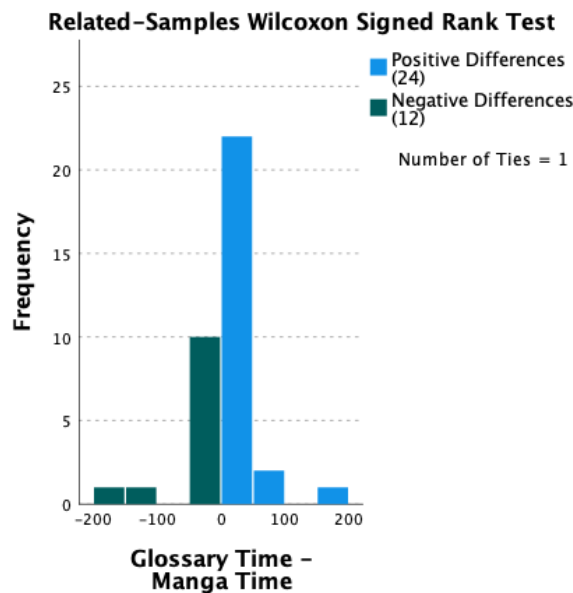
The second research question attempted to answer whether the time spent on *manga* text versus glossary text differs. The time that each participant spent was recorded by Canvas. The time that each participant spent answering questions each day was recorded and calculated as weekly times for Week 1 and Week 2. In summary, based on the close examination methods detailed in the Appendix F, five cases were determined to be outliers and were removed from the data set. After removing outliers (see Research Question 2 in Appendix F), assumption testing followed (see Appendix F).

4.3.2 Assumption Testing for Research Question 2 Results

In the assumption testing, it was confirmed that the data are not normally distributed. When the data is not normally distributed, a non-parametric test should be used. Therefore, a Wilcoxon signed rank test, which can be thought of as the non-parametric version of a paired t-test, was conducted to compare the time spent reading *manga* versus the time spent reading text with English glossaries. The differences in scores were approximately symmetrically distributed (see Figure 4.2).

Figure 4.2

Related-Samples Wilcoxon Signed Rank Test



Of the 37 participants, 12 participants spent more time reading the *manga* text compared text with English glossary, whereas 24 participants spent more time reading with English glossary compared to *manga*, and one participant did not show any difference. A Wilcoxon Signed Rank Test was conducted to compare the medians (Table 4.4 and Table 4.5).

Table 4.4

Wilcoxon Signed Rank Test: Hypothesis Test Summary

	Null Hypothesis	Test	<i>p</i>	Decision
1	The median of differences between <i>Manga</i> Time and Glossary Time equals 0.	Related-Samples Wilcoxon Signed Rank Test	.198	Retain the null hypothesis.

Table 4.5
Related-Samples Wilcoxon Signed Rank Test S

Total N	37
Test Statistic	415.000
Standard Error	63.639
Standardized Test Statistic	1.289
Asymptotic Sig.(2-sided test)	.198

There was no statistically significant improvement in the time spent reading *manga* (Mdn = 68 minutes) compared to reading text with English glossary (Mdn = 72.50 minutes), $z = 1.289$, $p = .198$. Therefore, we failed to reject the null hypothesis that there was no difference in the median time that participants spent between *manga* and text with English glossaries.

4.4 Results for Research Question 3

4.4.1 Assumption Testing for Research Question 3

To understand whether the text type had any effect on the retention of vocabulary after two weeks, a two-way repeated measures ANOVA was conducted. With two different text types, the vocabulary scores were recorded at the two different times (inference and retention). There were 30 participants who finished all tasks of the pretest, the inference test, and the retention test.

When using a two-way repeated measures ANOVA, six assumptions must be met. All six assumptions were examined and will be summarized in this section. For detailed explanation, see Appendix F under Assumption Testing for Research Question 3. The first three assumptions were related to the study design, and they were met for non-biased results.

The fourth assumption is that there should be no significant outliers in any cell of the design. The cells of the design and each mean were shown in Table 4.6.

Table 4.6***Cells of the Design***

		Time	
		Inference test	Retention test
Text type	<i>Manga</i> n=30	<i>m</i> =14.27 <i>sd</i> =6.31	<i>m</i> =8.90 <i>sd</i> =6.71
	Glossary n=30	<i>m</i> =9.37 <i>sd</i> =6.27	<i>m</i> =8.00 <i>sd</i> =6.37

For detecting outliers in any cell in the above, box plots are yielded (see Figures F8, F9, F10, F11 in Appendix F). There were no outliers in the inference test through *manga* and glossary text (see Figure F8 and Figure F10). The ID #26 was an outlier in both retention tests of *manga* and glossary text (see Figure F9 and Figure F11). To further investigate outliers, four residuals dialogue boxes were examined (see Table F14 in Appendix F).

For the vocabulary retention scores through *manga* text and English glossary, the results indicated that the scores of ID #26 were outlier (3.20 and 3.35 respectively). This may indicate that ID #26 is a high achiever and learned the vocabulary from one exposure.

Based on the above observations, the detected outliers were not unusual. The researcher went back to check for any data entry errors and measurement errors. However, none such cases were detected. Therefore, the researcher determined to keep all vocabulary score values.

4.4.2 Assumption Testing for Normality

The fifth assumption is that the dependent variable should be approximately normally distributed for each cell of the design. This assumption was tested through the Shapiro-Wilk test of normality. All the vocabulary scores were run through SPSS to detect whether the vocabulary scores were normally distributed: inference through *manga* reading, and two-week retention test

for *manga* reading as well as for inference through glossary reading, and two-week retention test (see Table F17 in Appendix F).

To understand whether the data are normally distributed, the significance level under Shapiro-Wilk column is examined. When the significance level is above .05, the data is normally distributed. As indicated above, all scores were above .05 ($p > .05$) as assessed by Shapiro-Wilk's test of normality on the studentized residuals.

4.4.3 Test of Sphericity

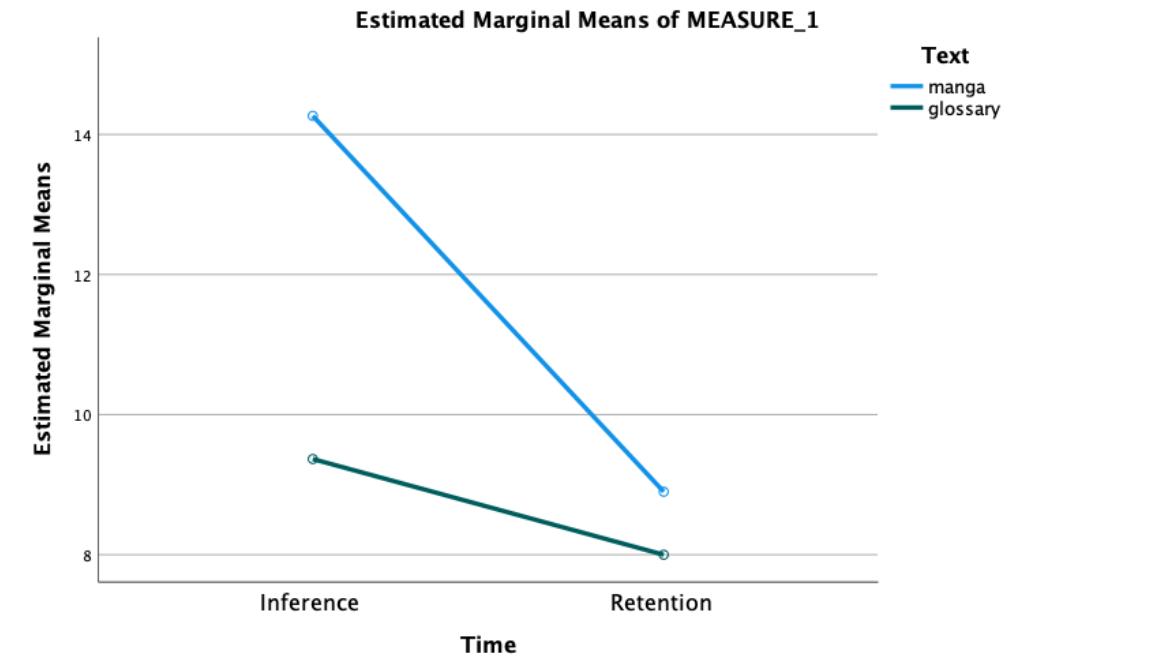
The sixth assumption is the assumption of sphericity or the repeated measures equivalent of the assumption of homogeneity of variances. This assumption is necessary for significance testing in the two-way repeated measures ANOVA (Laerd, 2015). This is verified using Mauchly's test of sphericity. However, sphericity is not a concern when you have only two levels within each repeated measures factor, because there are only two possible pairs. Therefore, you do not need to test for sphericity in a two-way repeated measures ANOVA when each group has only two levels.

4.4.4 Interaction Between Text Type and Time

All the assumption tests were run and suggested that that the two-way interaction results were not biased. To determine the effect of different text types on vocabulary retention over time, a two-way repeated measure ANOVA was conducted. The results are visually presented in the profile plot in Figure 4.3.

Figure 4.3

Profile Plot for Interaction of Text Types and Time



The profile plot illustrates that the vocabulary scores at the inference test for two different text types. The mean score for *manga* is higher than the glossary text. In the retention test after two weeks, the vocabulary score decreased for both text types, and the decrease was particularly steep for the *manga* text. This information was closely examined with the statistics analysis in Table 4.7.

Table 4.7**Tests of Within-Subjects Effects: Interaction of Text Types and Time**

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Text	Sphericity Assumed	252.300	1	252.300	20.455	<.001	.414
Error(text)	Sphericity Assumed	357.700	29	12.334			
Time	Sphericity Assumed	340.033	1	340.033	16.602	<.001	.364
Error(Time)	Sphericity Assumed	593.967	29	20.482			
Text * Time	Sphericity Assumed	120.000	1	120.000	23.200	<.001	.444
Error(text*Time)	Sphericity Assumed	150.000	29	5.172			

The text and time interaction was examined under Sphericity Assumed. The significance level was $p < .001$. Therefore, there was a significant two-way interaction between the text type and time, $F(1, 29) = 23.200$, $p < .001$, partial $\eta^2 = .444$.

To ensure the extreme pretest scores did not affect the results of the interaction of the text and the time, an ANCOVA was also conducted (see Table F26 in Appendix F), with the pretest scores included as covariates. The results also indicated that there was a significant two-way interaction between the text type and time, $F(1, 27) = 18.99$, $p < .001$.

Both results indicated that the effect of the passage of time on the outcome of the vocabulary score was moderated by the text type. What this means is that these two factors of the text type and the passage of time, influenced the vocabulary score. As time progressed from the

inference test to the retention test after two weeks, the vocabulary scores went down for both text types, with a particularly steep decline from the *manga* text.

Now that a significant interaction between the text type and time was observed, whether simple main effects exist was examined as follows.

4.4.5 Simple Main Effects of Text Type

To test simple main effects of text type, the differences in the vocabulary score between the two text types are compared at the two different times (the time of inference and retention test after two weeks). A general linear model test with repeated measures on different text types was conducted to examine whether there was a significant difference between the text types at the two different times.

4.4.5.1 Comparison of the Vocabulary Inference Score: *Manga* and Glossary

It was examined whether there was a simple main effect of the text type on the vocabulary inference test (Table 4.8 and Table 4.9). Post hoc tests were intended before yielding the results. Therefore, Bonferroni adjustment was used. There was a statistically significant difference in vocabulary inference scores between different text types, $F(1, 29) = 30.16, p < .001$, a mean difference of 4.9, 95% CI [3.075, 6.725]. The vocabulary score was statistically significantly higher in *manga* ($M = 14.27, SD = 6.31$) as compared to the glossary text ($M = 9.37, SD = 6.27$) at the inference test, $F(1, 29) = 30.16, p < .001$, partial $\eta^2 = .51$.

Table 4.8***Tests of Within-Subjects Effect: Inference Vocabulary Score for Text Types***

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
TextType	Sphericity Assumed	360.150	1	360.150	30.155	<.001	.510
Error (TextType)	Sphericity Assumed	346.350	29	11.943			

Table 4.9***Pairwise Comparisons: Inference Vocabulary Score for Text Types***

Measure: MEASURE_1

(I) TextType	(J) TextType	Mean Difference (I- J)	Std. Error	Sig. ^b	95% Confidence Interval for Difference ^b	
					Lower Bound	Upper Bound
<i>manga</i>	<i>glossary</i>	4.900*	.892	<.001	3.075	6.725

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

4.4.5.2 Comparison of the Vocabulary Retention Score: *Manga* and Glossary

The next step was to detect a simple main effect for text type for the vocabulary retention test (Table 4.10 and Table 4.11). The vocabulary scores were not statistically significantly different through the *manga* text ($M = 8.90$, $SD = 6.71$) compared to the glossary text ($M = 8.00$, $SD = 6.37$) at the two-week delayed retention test, $F(1, 29) = 2.18$, $p = .15$, a difference of .90, 95% CI [-.346 to 2.146], partial $\eta^2 = .07$.

Therefore, it is concluded that there was no significant difference in the vocabulary retention test score between the *manga* text and the text with glossary after two weeks, even though the retention score through the *manga* was slightly elevated ($M=8.9$) than the score through glossary ($M=8$). There was no simple main effect for the text type on the two-weeks retention test.

Table 4.10

Tests of Within-Subjects Effects: Retention Vocabulary Score for Text Types

Measure: MEASURE_1

		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Source							
TextType	Sphericity Assumed	12.150	1	12.150	2.184	.150	.070
Error (TextType)	Sphericity Assumed	161.350	29	5.564			

Table 4.11

Pairwise Comparisons: Retention Vocabulary Score for Text Types

Measure: MEASURE_1

(I) TextType	(J) TextType	Mean Difference (I- J)	Std. Error	Sig. ^a	95% Confidence Interval for Difference ^a	
					Lower Bound	Upper Bound
<i>manga</i>	glossary	.900	.609	.150	-.346	2.146

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.

4.4.6 Comparison of Time: Inference test and Retention test

The simple main effect of time on vocabulary score for the *manga* and glossary texts was analyzed using a general linear model repeated measure test (within-subjects factors: *manga* and glossary texts). After the simple main effect of time was examined, the pairwise comparisons were examined in the following order: comparison of *manga* inference test vs. *manga* retention test, and the comparison of glossary inference test vs. glossary retention test.

4.4.6.1 Simple Main Effect of Time: *Manga*

In interpreting the simple main effects of time for *manga*, Mauchly's Test of Sphericity was considered. As mentioned previously, sphericity is not a concern when there are only two levels within each repeated measures factor. Therefore, test for sphericity in a two-way repeated measures ANOVA is not necessary when each group has only two levels. Therefore, the section that "Sphericity Assumed" rows of the Tests of Within-Subjects Effects table was examined (see Table 4.12). According to the table, the simple main effect of time for *manga* over time was statistically significant, $F(1, 29) = 33.91, p < .001$, partial $\eta^2 = .539$.

Table 4.12

Tests of Within-Subjects Effects: manga

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
time	Sphericity Assumed	432.017	1	432.017	33.908	<.001	.539
Error(ti me)	Sphericity Assumed	369.483	29	12.741			

To understand at which time points the differences lie, the Pairwise Comparisons table was examined. As revealed in Table 4.13, there was a significant decrease in the vocabulary score from the inference test ($M = 14.27$, $SD = 6.31$) to the retention test ($M = 8.90$, $SD = 6.71$), a statistically significant mean decrease of 5.37, 95% CI [3.48, 7.25], $p < .001$.

Table 4.13

Pairwise Comparisons: manga

Measure: MEASURE_1

(I)	(J)	Mean Difference (I-J)	Std. Error	Sig. ^b	95% Confidence Interval for Difference ^b	
					Lower Bound	Upper Bound
time	time					
1	2	5.367*	.922	<.001	3.482	7.252

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

4.4.6.2 Simple Main Effect of Time: Glossary

To detect simple main effect of time for the glossary group, a general linear model repeated measure test was run. Sphericity is not a concern when there are only two levels within each repeated measures factor. Therefore, test for sphericity in a two-way repeated measures ANOVA is not necessary when each group has only two levels. Therefore, the section that “Sphericity Assumed” rows of the Tests of Within-Subjects Effects table was examined. As revealed in Table 4.14, the simple main effect of time for the glossary group was not statistically significant, $F(2, 29) = 2.152$, $p = .152$, partial $\eta^2 = .070$.

Table 4.14***Tests of Within-Subjects Effects: Glossary***

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
time	Sphericity Assumed	28.017	1	28.017	2.170	.152	.070
Error (time)	Sphericity Assumed	374.483	29	12.913			

To understand where potential significant differences between time points lie, the Pairwise Comparisons table was examined. As revealed in Table 4.15, although there was a decrease in vocabulary score from the inference test ($M = 9.37$, $SD = 6.27$) to the retention test ($M = 8.00$, $SD = 6.37$), there was no statistically significant mean decrease for the glossary task, which was 1.37, 95% CI [-.53, 3.26], $p = .152$.

Table 4.15***Pairwise Comparisons: Glossary***

Measure: MEASURE_1

		Mean Difference (I-J)	Std. Error	Sig. ^b	95% Confidence Interval for Difference ^b	
(I) time	(J) time				Lower Bound	Upper Bound
Inference	Retention	1.367	.928	.152	-.531	3.264

Based on estimated marginal means

b. Adjustment for multiple comparisons: Bonferroni.

4.4.7 Vocabulary Score Differences: Pretest, Inference, and Retention Test

To assess the impact of different text types on participants' vocabulary learning, paired-sample t-tests were conducted between the pretest and the inference test, as well as between the pretest and the retention tests. The main interest is to detect whether there was a statistically significant change in the vocabulary score between the pretest and the retention test. The Table 4.16 shows the descriptive statistics for the mean and standard deviations for pretest, inference test and retention test for both text types.

Table 4.16

Descriptive Statistics for Paired Samples Statistics from pretest to inference and retention tests

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PreTest <i>Manga</i>	3.87	30	3.711	.678
	Inference <i>Manga</i>	14.27	30	6.308	1.152
Pair 2	PreTest Glossary	4.33	30	4.693	.857
	Inference Glossary	9.37	30	6.272	1.145
Pair 3	PreTest <i>Manga</i>	3.87	30	3.711	.678
	Retention <i>Manga</i>	8.90	30	6.707	1.225
Pair 4	PreTest Glossary	4.33	30	4.693	.857
	Retention Glossary	8.00	30	6.373	1.164

The assumption testing was conducted for the t-tests (see from Figure F12 to F15 and Table F18 to Table F25 in Appendix F). There was one outlier in Pair 1 (pretest *manga* vs. inference *manga*). However, the outlier was the sign of high achiever, and the outlier remained in the data. The data was normally distributed. There was no outlier in Pair 2 (pretest glossary vs. inference glossary), and the data was normally distributed. There were two outliers in Pair 3 (pretest *manga* vs. retention *manga*). The outliers were taken as the sign of high achievers and both data remained in the data set. The distribution was not normally distributed, and the researcher needs caution to interpret the data. Four outliers were detected in Pair 4 (pretest

glossary vs. retention glossary), but all data were kept in the data set. The distribution was not normal, and the researcher needs caution to interpret the data.

Although it requires caution, the results of the t-tests (see Table 4.17) indicated that there was a significant mean increase from pretest to inference test for both text with *manga* and text with glossary, but only *manga* had a significant increase from pretest to retention test. This suggests that *manga* could have assisted with improving retention. However, the results of the general linear model repeated measure test suggested no significant differences in mean retention scores and therefore, the researcher should be cautious to not overstate this until a larger sample can be collected.

Table 4.17
Paired Samples Test

		Paired Differences					t	df	Significance	
		Mean	Std. Devia tion	Std. Error Mean	95% Confidence Interval of the Difference				One- Sided p	Two- Sided p
					Lower	Upper				
Pair 1	PreTest <i>Manga</i> - Inference <i>Manga</i>	-10.400	5.096	.930	-12.303	-8.497	-11.177	29	<.001	<.001
Pair 2	PreTest Glossary - Inference Glossary	-5.033	4.620	.843	-6.758	-3.308	-5.967	29	<.001	<.001
Pair 3	PreTest <i>Manga</i> - Retention <i>Manga</i>	-5.033	6.300	1.150	-7.386	-2.681	-4.376	29	<.001	<.001
Pair 4	PreTest Glossary - Retention Glossary	-3.667	6.211	1.134	-5.986	-1.347	-3.234	29	.002	.003

The following figure (Figure 4.4) indicates individual participants' scores of pretest, inference test and retention test (Moore, 2023).

Figure 4.4

Individual Vocabulary Scores: Pretest, Inference, Retention Performance³

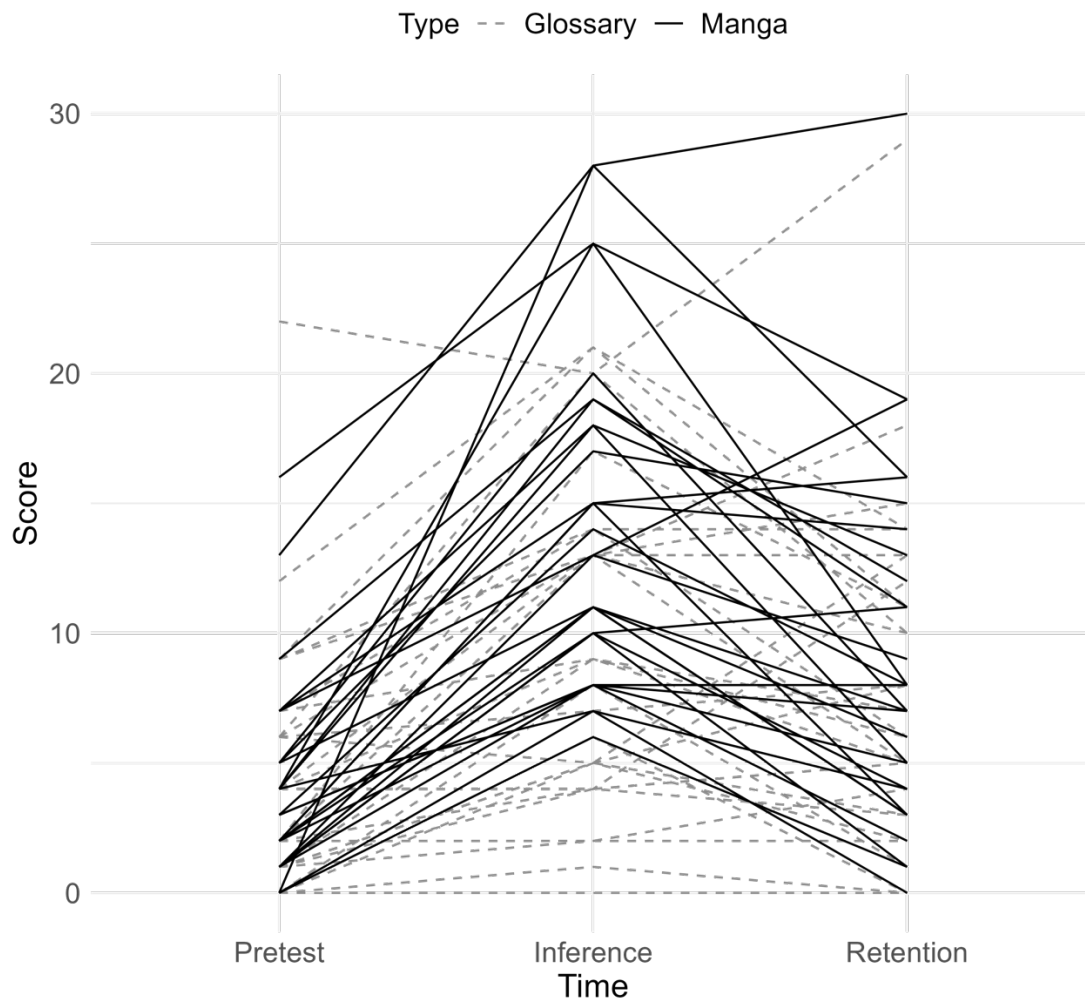


Figure 4.4 visually represents how individual participants score in pretest, inference, and retention tests. When comparing the dotted lines (glossary) with the solid lines (*manga*), it indicates that the participants experienced a steep increase in their inference scores when reading

³ T. Moore, provided during statistics consultation, September 29, 2023

text with *manga*. The overall pattern for reading *manga* has a clear increase in inference and a clear decrease in retention while the participants' pattern of scoring at each point varied when reading through glossary. These results are aligned with the t-tests results.

4.5 Summary of Chapter 4

In summary, the results of a repeated measure t-test indicated that the vocabulary inference scores through *manga* were significantly better than those of the glossary text. For the time that participants spent in inferring vocabulary, the results of a Wilcoxon signed rank test revealed there was no significant difference between *manga* and glossary texts. For the vocabulary retention test, the results from a two-way repeated measures ANOVA indicated there was a significant two-way interaction between the text types and the time. When investigating simple main effect of different text types, the vocabulary score through *manga* was significantly better than through glossary in the inference test. In the vocabulary retention score, the vocabulary score was not significantly different between the *manga* text and the glossary text after two weeks. A general linear model repeated measures test revealed that the simple main effect of time was statistically significant for *manga* text. A pairwise comparison table indicated that there was a significant mean decrease from the inference test to the retention test for *manga*. A general linear model repeated measures test revealed that the simple main effect of time was not statistically significant for glossary text. A pairwise comparison table indicated that there was no significant mean decrease in the vocabulary score from the inference test to the retention test for glossary text. The paired-samples t-tests indicated that there was a significant increase from the pretest to the inference test through both *manga* and glossary texts, and a significant increase from the pretest to the retention test only through *manga* text. While the t-test suggested that *manga* may assist participants in increasing new vocabulary significantly better than the text

with glossary, the general linear model repeated measures test indicated that there was no significant difference in the mean retention score, with the higher mean score of *manga* (M=8.9) compared to the glossary (M=8). With a participant count of 30, lower than the targeted number from the a priori power analysis (n=34), the study might lack the necessary statistical power to assert that *manga* is effective in retaining new vocabulary.

5. DISCUSSION

The results of this study contribute in several ways to the understanding of *manga*'s effect on JWL learners' vocabulary learning. This chapter will discuss the interpretation of the results above and connect those results to the research literature regarding *manga*'s effects on vocabulary learning. This chapter is divided into three parts according to the three research questions. The research questions presented previously are as follows:

1. To what extent does *manga* influence one's ability to infer the meaning of unknown words compared to the text with English glossary?
2. To what extent does *manga* influence the speed at which one can infer meanings of unknown words compared to the text with English glossary?
3. To what extent does *manga* affect the retention of vocabulary over two weeks as compared to the text with English glossary? (*manga* text vs. English glossary text)?

Regarding the first research question, the quantitative data and participant survey results were analyzed. The second research question were analyzed based on the time spent when participants completed their vocabulary inference tests. The third research question was examined through the results from the two-week delay tests of their vocabulary memory.

5.1. Discussion for Research Question 1

5.1.1 Participants' inference of unknown words through *manga* vs. English glossary

The pretest results did not reveal significant differences between participants' knowledge of vocabulary before starting inference testing. The background survey also indicated that none of the participants possessed a proficiency above the second semester level. Based on these results, the data was analyzed for the first research question. The participants' vocabulary inference score through *manga* readings was significantly better than through reading with an

English glossary. This result indicated that *manga* helped participants to infer unknown words correctly and there were a few factors that can explain these results. As discussed in the literature review section, these results are aligned with former research indicating that all vocabulary learning studies of glossaries with text and picture glossaries outperformed the group with text only glossaries (Kost, Foss & Lenzini, 1999; Yeh & Wang, 2003; Plass et al, 1998; Yoshii, 2006). Bitz's study indicated less proficient students particularly benefited in their reading tasks when they were exposed to graphic novels (Bitz, 2004). Thus, it is likely that *manga* provided additional context through visual information. The text contained unfamiliar words in addition to the two words in question. The stories used in the study aimed just beyond the current level of participants' reading proficiency. However, through the context provided with *manga*, participants were able to infer the meaning of words in question correctly as their understanding was supported by visual imagery. When participants were exposed to text with only an English glossary, there were too many unknown words for which they had to read and decode meaning. Participants ended up processing too many unfocused inferences, creating confusion. Using their existing knowledge of Japanese language, as well as their world knowledge, participants looked at both text and image, and had meaning-making moments (i.e., noticing moments) by interacting with both modes (i.e., text and image) and by filling the gap between the two modes thereby inferring the meaning of words. They obtained additional comprehensible input due to the context that *manga*'s image provided. Based on the provided context (i.e., comprehensible input), they were able to focus on the "1" (i.e., new information) of, using Krashen's terminology, Comprehensible Input ("i") plus "1" (Krashen, 1982). Nation (2022) called it "meaning-focus input" and Schmidt (1990) proposed Noticing Theory, indicating the moment of learning occurs as the result of comprehensible input.

What brings learners to this moment of comprehensible input is context. Halliday (1999) claimed that there are two types of contexts. Those who engage in conversation or engage in reading need both types of contexts. One type of context is what Halliday called a “context of culture.” “Culture” according to Halliday, is not just a culture in a different part of the world, but it includes “the environment for language as system” (Halliday, 1999, p. 1). Therefore, the culture of context in the example below is a conversation between a newly arrived exchange student and host family. The “context of culture” in the traditional sense is that it is customary to bring gifts to people who would take care of you.

The other type of context is “context of situation.” The context of situation supports inference (Halliday says “construe”) and is needed to understand the text. Context of situation contains these three elements: field, tenor and mode. “Field” refers to what is happening. “Tenor” indicates the relationship between (or among) interlocutors. Finally, “mode” indicates the mode of communication such as conversation, monologue, or written mode, etc. (Halliday, 1985; Halliday 2002, p.283; Hori, 2017). *Manga* has all three elements presented with the text and images. Analyzing Figure 5.1 “*Manga* text example” gives us the following analysis:

- Context of Culture: conversation between exchange student and host family
- Context of Situation: an exchange student arrived at the airport to meet host family
- Field: Asking question about a sightseeing site, and gifting of a souvenir
- Tenor: an exchange student and their host family
- Mode: Conversation between the exchange student and host family, monologue of the exchange student, facial expression

Figure. 5.1 Manga text Example



Figure 5.2 Text with English Glossary

At the airport
 ケイ：はじめまして。ケイです。よろしくおねがいします。
 ホストファミリー：こちらこそ、よろしくおねがいします。
 ケイ：あれがゆうめいなとうきょうスカイツリーですね。
 ホストファミリー：そうそう。スカイツリーはせかいでいちばんたかいでんばとうだよ。よるのライトアップもきれいだよ。
 (glossary) でんばとう：radio tower

At home
 ホストファミリー：これからいねんよろしくね。
 ケイ：はい。よろしくおねがいします。これ、つまらないのですが。。。
 ホストファミリーのおかあさん：なにかしら。
 ケイ：ぼくがやいたゆのみです。
 ケイ：あー**わけてる**！もしかしてあのとき。
 ホストファミリーのおかあさん：あらー。せっかくつくってくれたのに。ざんねんね。

English Translation – (both texts identical)

At the airport

Kei: It's nice to meet you. I'm Kei.

Father/Mother: No, the pleasure is ours.

Kei: That's the famous Tokyo Sky Tree, isn't it?

Father: Oh yes. The Sky Tree is the world's tallest cellular tower.

Father: The night lights are also beautiful.

At home

Father: Here's to the year ahead!

Kei: Yes, thank you in advance!

Kei: Here is a small token of my appreciation.

Mother: Oh, I wonder what that is.

Kei: It's a teacup I made.

Kei: Oh, it's broken! I wonder if it happened that one time...

Father: Oh no.

Mother: And you went through all the trouble of making it for us. That's too bad, isn't it.

The stories used for this study are about “Kei,” who started home staying and studying abroad in Japan, and his host family. These characters are constant throughout, and this consistent context was evident when presented as a storyline with *manga*. Additionally, Kei's situation is something that current college students are familiar with and so those reading the *manga* version had a more realistic understanding because of how the text was visually presented and could more easily infer the meaning of unknown words. This is aligned with Halliday's

context of culture and context of situation. Providing context that learners have access to is important to support inference.

With an understanding of context of culture and context of situation, we can examine specific instances using the texts that were used in the study for Week 1, Day 1 (see Figure 5.1 and 5.2), in which the protagonist, Kei, brought a souvenir to their host family in Japan. Kei baked a ceramic dish for his host parents but found out that it had broken during his trip to Japan. The unknown words being tested for inference were “*yaita/yaku*” (baked/fired) and “*wareteru/wareru*” (is broken). Without even knowing any words in Japanese, readers can guess that Kei arrived in the airport, met two people, and gave them something which was, unfortunately, broken. For this particular question, 71 students completed the task. 35 students read the *manga* text and 36 students read the text with glossary. For the unknown word “*yaku*,” 11 students who read *manga* inferred the meaning correctly (resulting in a correctness rate of 31%) while no students inferred correctly in the glossary group (0% correctness rate). For the unknown word “*wareru*,” 32 students who read *manga* answered correctly (resulting in a correctness rate of 91%), and only three students in the glossary group answered correctly (8% correctness rate). What should be noted is that one student who read with the glossary answered “jealous” (妬く, *yaku*). This participant probably knew the Japanese word “jealous” that happens to be the same pronunciation of 焼く (*yaku*, to bake). Five students from the glossary group and one from the *manga* group answered “forgotten” for 割れる “*wareru*” (to have been broken)—which is a very similar sounding word “忘れる” (*wasureru*). This revealed one of the challenges that learners of JWL face on an everyday basis. The Japanese language has many homonyms or 同音異義語 (どうおんいぎご), which are spelled the same in the syllabaries and but have different meanings that are only evident when using kanji. If the reader of the text mistakenly

intakes the unknown word's meaning as "to forget" in the above example, the original meaning of the text is completely lost.

People process these different elements by interacting with them and by interrogating the possibility of meaning. They come to make meaning, and that leads to learning (Halliday, 1999). Non-verbal modes such as facial expressions are also considered as a mode. In this case, participants who were reading the text with English glossary missed the information contained in a facial expression. This facial expression implies something bad happened, and it leads to meaning making that the ceramic is broken. A meaningful amount of information is processed within the four panels. *Manga* provides this information through its visual imagery. For those whose proficiency levels are at the beginning stages, it is difficult to process just with text, but with visual information to assist their understanding of context, it leads to their correct inference of the unknown words.

Participants read the text with English glossary with merely the situation listed as "At the airport" and "At home." However, these words do not provide a meaningful amount of context, Halliday states. This is called "situational approach" (Halliday, 1999, p. 10), and while they gave some idea where the conversations were held, they do not fully help with context as the words in question "bake" and "is broken" have nothing to do with being "at the airport" or being "at home." These situational settings are not the same as the "context of situation" according to Halliday. Context of situation is a theoretical form to explain how a text is interacted with and reflected upon due to a social situation (Halliday, 1999). Therefore, mere text to indicate the situation such as "at the airport" or "at home" does not support the creation of context of situation. This does not expose participants to intertextuality (i.e., the gap of information between different modes) as efficiently as *manga*. Intertextuality supports us in exchanging

meaning (i.e., negotiating meaning with text and image) and in making meaning and leads us to a noticing moment. When participants read *manga*, they have more comprehensible input than when they were exposed to reading with English glossary.

5.1.2 Motivational Factor

The second factor is the learners' motivational factor. As mentioned, *manga* positively impacts many learners' motivation (Goldberg et al., 2015; The Japan Foundation, 2018). Modern learners are accustomed to being exposed to multimedia materials and tend to depend on visual information. Information that is visually presented is a format familiar to younger generations. Considering the complexity of the Japanese writing system, when learners see some visual information along with the text, it may appear less overwhelming to them. Another motivation is the popularity of Japanese popular culture among youth. Rap (2011), Norton (2003) and Bitz's (2004) research indicated that learners of world languages, as well as students in literary classes, maintain their motivation throughout their literary activity even though the learner did not have complete proficiency to understand the text.

5.1.3 Order of Exposure to Different Types of Text

The last factor is the order of exposure. Each participant read both text types over the course of two weeks of inference testing. The order of exposure to different types of texts may have impacted the test results due to carryover effects and learning effects. Participants who were exposed to glossary texts first became familiar with that questioning style. When they were later exposed to text plus *manga* in the second week, they were already familiar with the style and were able to give more correct answers with the visual information. This order of text exposure may also have affected some participants' motivation and attention levels. To minimize any carryover effects and learning effects, the participants were randomly split into two groups,

and the order of exposure was also randomized by assigning the other text type. For enhancing the validity of the study, it was implemented in a two-period, two-sequence crossover design. However, the current study is still not free from these biases for the reasons referenced above.

5.2 Discussion for Research Question 2

5.2.1 Time Spent in Inferring Vocabulary

The second research question was to investigate to what extent the time that participants spent between *manga* text and glossary text was different. Comparing the medians, although the time that participants spent reading *manga* was shorter than the time when they read with English glossary, they were not significantly different (see Table 4.4)

Table 4.4

Wilcoxon Signed Rank Test:

Hypothesis Test Summary				
	Null Hypothesis	Test	<i>p</i>	Decision
1	The median of differences between <i>Manga</i> Time and Glossary Time equals 0.	Related-Samples Wilcoxon Signed Rank Test	.198	Retain the null hypothesis.

The researcher hypothesized that participants would spend less time considering the effect of *manga*, which provides context visually. Contrary to the researcher's hypothesis, the results revealed that there was no significant difference in the time spent reading each text. There were several unrealistic timestamps captured, such as '1440 minutes.' These extreme numbers were removed as outliers. However, there were seemingly unrealistic timestamps for both *manga* and glossary readings. This may be partially due to the fact that the five rounds of data collection could not be conducted in a laboratory setting. All participants remotely accessed the learning

management system when they had free time. Time spent each day on each task was measured by Canvas. Presumably, some participants got distracted during the study and returned to complete it later. Another issue might have been the font size that appeared in each text. When you compare the two texts in the same browser with the same proportions, the font size looks smaller in the *manga* example (see Figure 5.3 and Figure 5.4).

Figure 5.3 Manga Text Sample

Question 2 2 pts

Read the following manga and answer the question.

1. What is the meaning of おりて (dictionary form: おりる)?

2. What is the meaning of うごかない (dictionary form: うごく)?

Figure 5.4 Text with Glossary Sample

Question 2 2 pts

Glossary

いちいん: a member of ~

ながたび: a long trip

はし: the edge (of the bed)

しょうがない・しかたない: can't be helped

ホストファミリーのおかあさん: いぬは好き? かぞくのいちいんのハチよ。

ケイ: はい、大好きです。ハチ、おいでー。なかよくしようね。

ホストファミリーのおかあさん: ながたびでつかれたでしょう。おやすみなさい。

ケイ: おやすみなさい。

ホストファミリーのおかあさん: こら、ハチ!

(ダダダダ。。。Hachi is running to the bed)

ケイ: ハチ、ねたいから、ベッドからおりて。いぬは好きだけど、アレルギーがあるんだよね。。。

(Hachi ignores Kei)

ケイ: うごかないから、しょうがないなあー。しかたないから、きょうはベッドのほしでねるよ。おやすみ。

Depending on the environment, whether a participant had access to a large monitor, had knowledge of how to enlarge their personal view or just had poor eyesight, all could have affected the validity of this study. Therefore, the results of the second research question should be examined with caution.

5.3 Discussion for Results for Research Question 3

5.3.1 Vocabulary Retention Test

The third research question was to investigate to what extent text *manga* assists with retention of vocabulary after two weeks as compared to text with English glossary. The results

from the two-way repeated measures ANOVA indicated that there was an interaction between the text type and time passing. The results of the interactions suggested that these two factors, text type and the passing of time, influenced the vocabulary score. For *manga* reading, the vocabulary score over time indicated that there was a statistically significant mean increase from pretest to inference test and a statistically significant mean decrease from the inference test to the memory test. On the contrary, for the glossary text, a significant increase was only observed from pretest to inference test. For the glossary text, a decrease from the inference test to the memory test was observed, but it was not statistically significant.

These results can be interpreted as indicating that the *manga* reading assisted learners' inference of unfamiliar words, however, it did not help them retain the vocabulary after two weeks. On the other hand, the English glossary also assisted with the inference of unfamiliar words, but not as significantly as did the *manga* reading. And while the inference was not as effective as with *manga* reading, the decline in vocabulary retention was also less steep. This puts forth that readers of *manga* might require reinforcement and follow-up activities to better retain the vocabulary compared to when they read through the English glossary.

The results present a contradiction of one of the claims in Dual Coding Theory (DCT) by Paivio (1980, 1988, 2014; Sadoski & Paivio, 2013). As discussed in the literature review section, with DCT, human cognition systems, which are comprised of two separate coding systems (verbal systems and non-verbal systems), interact with each other, and enhance learning. When people read a text with visual information, mental imagery is activated and interacts with the textual information. This interaction enhances learners' long-term memory (Sadoski & Paivio, 2013; Paivio, 2018). If what DCT claims were to be valid, when participants read *manga*, they would have retained more vocabulary after two weeks. However, the results showed that the

participants did not retain vocabulary significantly better than when they read with English glossary.

The current study's findings also contradict findings revealed by Aghaei & Goughani (2016), Başal et al. (2016), and Tabatabaei & Shams (2011). Aghaei & Goughani (2016) conducted a quantitative study to investigate whether multimodal pedagogy assists ESL learners' English vocabulary retention and Başal et al. (2016) conducted a quantitative study about whether graphic novels assist ESL learners' English vocabulary retention. Both studies indicated visual information assisted their vocabulary retention significantly better than the control group. The study by Tabatabaei and Shams (2011) revealed that the text plus picture glossary group performed significantly better than any other glossary type in their vocabulary learning. This could be because all the studies by Aghaei & Goughani (2016) and Başal et al. (2016) were conducted over longer period (10 weeks of intervention and four weeks of intervention, respectively). However, the current study spent four days for one text type. In the study of Tabatabaei and Shams (2011), they measured their vocabulary learning with production and comprehension tests. The current study asked participants to answer the meaning of the vocabulary in an isolated situation without any context in the two-week delay test. This may have affected the results of the memory test and suggests areas of future improvement of methods.

One factor that may shed light on the above results is the Involvement Load Hypothesis (Laufer & Hulstijn, 2001). Laufer and Hulstijn (2001) proposed the Involvement Load Hypothesis and claimed that learners who infer the meaning of words from context retained the words better than when they received synonyms of the words. Through "greater depth of processing; better, more intense quality of information processing; degree of elaboration; quality

of attention; richness of encoding” (Laufer & Hulstijn, 2001, p. 12). Additionally, they claimed that the better retention occurred under the three assumptions: need, search, and evaluation, and these assumptions are identified as the degree to which a learner was involved in the learning. The “need” factor is the “motivational, non-cognitive dimension of involvement.” The second factor, “search” describes the attempt to find the meaning of an unknown L2 word by use of dictionaries or by asking the teacher. The third of three factors, “evaluation” is a “selective decision based on a criterion of semantic and formal appropriateness (fit) of the word and its context.” It was suspected that *manga* fulfills the first need factor, which is motivation of learners and the second and third factors of the search and evaluation. However, the results indicated that the initial correct inference through *manga* diminished quickly. A few factors are suspected of causing this. One factor is that *manga* may not give as “higher-involvement load” as the use of glossary. In reading with English glossary, participants had to go through reading other parts and attempted to evaluate their inference and went through higher involvement compared to the time that they were exposed to *manga*. When they read *manga*, the inference came more easily than the time when they read with English glossary. Therefore, this may have been the reason that they did not retain the vocabulary after two weeks.

5.4 Significance of the Study

The current study shed light on the effects by *manga*, and how it may affect JWL’s vocabulary learning. Although many JWL instructors realize their avid *manga* readers in class achieve high proficiency in Japanese, there were few quantitative studies that delved into the effect of *manga* in vocabulary learning. This study explored multimodality of *manga*--the relationship of text and image, intertextuality, context and inference, and how that may affect learners’ learning vocabulary. *Manga* (graphic novels) are typically considered mere

entertainment material that are not intended for learning. If *manga* is proven to be an effective learning tool, researchers and classroom teachers can utilize this resource to support students' learning. Of note, it may be especially helpful for those who are behind others in their language proficiency. Images in *manga* support building context, thereby helping readers better infer the meaning of words. If *manga* is effective in building context, the usage can be expanded to graphic novels and children's picture books as well.

Vocabulary learning has been ignored for many years and teachers were dependent on learners' autonomy. However, it is obvious that vocabulary learning is the first step to learning a world language. One cannot understand the language without learning vocabulary. If *manga* is proven to assist one's vocabulary learning, those instructors who suspected the effect of *manga* but are unsure about the effect can be confident in utilizing *manga* in the classroom. With current learners' learning style change, instructors of world languages may be searching for ways to help learners' vocabulary acquisition. Instruction of world language education should change as learners' learning style change (Tohsaku, 2021). Learners will be motivated to read *manga* or GN inside and outside the classroom, and these multimodal materials will engage students better than reading without image in the beginning level language classes. The use of GN was also effective especially for students whose proficiency is lower (Liu, 2004; Bitz, 2004; Norton, 2003).

The current study explored how text and image interact with readers and create context to help infer unknown words. This interaction of text and image can similarly apply to vocabulary acquisition in other areas such as extensive reading as well as children's reading of picture books.

5.5 Limitations

5.5.1 Participant Related

There are several limitations to the current study. The participants of the study were all second semester students in two different universities. The level of proficiency varied person to person as did their exposure to the Japanese language. Although the pretests indicated that there was no significant difference in their vocabulary scores, participants in University B had more formal contact hours of classroom instruction at the start of the study. Therefore, the validity should be considered when examining the results. The five rounds of data collection were conducted during the Covid-19 pandemic. The fact that the data collection was completed five different times affects the reliability of this study. All participants accessed Canvas sites and completed the tasks on their own time. Their concentration factors such as test taking environment could have affected the reliability of the results. In addition, as mentioned previously, some of the recorded time that participants spent were of unreasonable duration. It is suspected that the participants forgot to hit the submit button or were swayed to do something else during the task. Out of 75 people who signed up to participate, 30 participants completed all tasks. This may be partially due to the pandemic, motivational issues, or high levels of school homework assignments making it difficult to keep up with this study's daily tasks for four weeks.

There is always a chance some participants were exposed to the words in question outside of class and this study. Those participants who encountered some words in the study would have been able to answer the two-week retention test regardless of the text type.

5.5.2 Methods Related

During the pretest, when the participant answered a different meaning of the word that does not match the meaning of the word that appeared in the study, it was marked wrong and received 0 points. For example, the word, *ageru* (written as あげる in Japanese) appeared as “raise” in the study. When you see the word without no context, that could mean either “raise” or to “give.” In scoring the pretest, the answer “to give” was marked wrong, therefore, they received 0 for the answer. This does not necessarily mean that the participant did not know the meaning of “to raise.”

The text did not contain any kanji. Not having any *kanji* in second semester material was not an authentic way to present text. However, it purposely avoided the advantage that might be caused by learners’ proficiency level of *kanji*. Some participants pointed out that the lack of *kanji* made it challenging to identify the word breaks. The fact that no *kanji* appeared may have affected one’s ability to read and their speed of reading.

The level of text was too challenging to some participants. Nation (2013) states that unknown words should be within 2% of the text. The difficulty of the text was determined based on the researcher’s experience and judgement. This could have affected validity. The level of the difficulty may have affected some participants’ ability of inference negatively.

Regarding how the English glossary was presented, it might have been more helpful if the glossary had been in line with the text in parentheses immediately after the word. Although the glossary was located just above the text and the researcher attempted to minimize the need for “hunting” for meaning in a glossary, this could have affected a participants’ eye movement and may have affected the time that they spent in reading.

Of the 42 participants in research question 1, 38 answered the pre-study survey. The survey results indicated that there were eight participants who have visited/lived in Japan. Those who have visited Japan may have had some advantages, as there were some cultural events described in the text used in the study. With their cultural knowledge, this supports context (Halliday, 1999), and it may have affected their understanding of the overall text. For example, it is common knowledge that you receive ice packs when you purchase cakes at the basement of department stores in Japan. Therefore, those who have visited Japan in the past may have had an advantage in inferring the word in question.

Grading criteria is another factor that poses limitation in the study. The researcher tried her best to be objective by creating grading criteria sheets (see Appendix D) when grading each answer, but grading is not free from one's subjectivity. The study should have gone through with non-biased third-party graders.

The current study explored the effectiveness of *manga* through reading, which is a receptive skill. The results of this study should not be generalized to the overall effectiveness of *manga*, as production is not tested. Although participants were exposed to the correct usage of the word in the particular context, whether or not participants can produce the correct usage was not tested.

5.5.3 Manga Related

Manga used in this research were not authentic (commercially available) *manga*, and the level of difficulty was deliberately adjusted by the researcher to provide texts of manageable difficulty so that participants would encounter comprehensible input as well as unknown words (+1). *Manga* stories were created first, and then the pictures removed for the text with glossary. Keeping the texts the same for two different text types was rather unnatural due to the

multimodal nature of *manga*. *Manga* provides information that is not written in texts. Therefore, *manga* texts could be understood without more textual information. In contrast, the text without images seemed to be lacking some information. Another factor is that *manga*'s feature of indicating where the conversation is taking place, such as "at the airport, etc." is more obvious due to the visual component. In the glossary text, these situations were labeled as text information. This fact may have resulted in more advantage for *manga* text.

5.6 Pedagogical Implication

Nation (2007, 2013b, 2022) claimed that four strands are necessary for a well-balanced language course. The four strands are meaning-focused input, meaning-focused output, language-focused learning and fluency development. The current study concerns the meaning-focused input through the receptive skill of reading, and how the meaning-focused input affects language learning. One way that learners increase the meaning-focused input for vocabulary acquisition is that teachers of world language implement extensive reading in their curriculum. Nation states, "research shows that the single most effective change a teacher could make to a language course is to include an extensive reading program" (Nation, 2022, p. 398). Extensive reading entails silent reading of a book of the learner's interest and preference. It also involves reading many books that are slightly above the learner's current proficiency. In a JWL classroom, extensive reading has gained much attention (Hanabusa & Juhn, 2018; Senoo, Y., & Yonemoto, K., 2014; Yoshimura & Sharon, 2017). Based on the results of this study, it is recommended that instructors include *manga* in the collection of books among other Japanese versions of graded readers to be used as instructional tools. *Manga* is designed for a silent, independent (i.e., thoughtful) reading and supports readers' vocabulary learning with context provided by its images. Finding the right level of reading text is important when implementing

extensive reading for providing comprehensible input. As mentioned previously, *manga* have a variety of readerships and difficulties, and learners may find it easy to find something of their interest and for their proficiency level.

Recommending the right level of *manga* depending on learners' proficiency level is necessary. Creating a chart to indicate the recommended level, the genre and a short synopsis may be a good way to encourage reading. For choosing the right level of text, West indicated that unknown words should be within one in every 50 words in regular text (West, 1955; Nation, 2022). With *manga*'s ability to provide context, it is suspected that learners will be able to infer unknown words and read with more than 2% of unknown words. In any case, what is important is that learners can read the *manga* independently while maintaining their motivation to learn. While learners engage in *manga* reading, they search for the correct meaning and usage of the unknown word by meaning-focus input. Therefore, an instructor of JWL should encourage learners to always infer the meaning of unknown words using their world knowledge and the context, take notes, and expose themselves to different context and how the word is used depending on the context, and lastly to engage in output activities. The following is to explain why, based on the results of this study, instructors of JWL should encourage learners to infer, to take notes and to engage in output activities.

5.6.1 Importance of Inference

Meaning-focus input/comprehensible input is needed to be able to produce correct sentences. If learners do not comprehend the correct usage of the word in the context, they cannot use the word correctly. As seen in this study, *manga* provides meaning-focus input through the context that is created by learners' interaction of different modes such as text and visual information. This meaning-focus input is completed by learners' inference that is reflected

by the context. Hulstijn (1992) claimed that those who went through inference by reflecting on context retained vocabulary better than when they had access to a synonym of the word (as cited in Laufer & Hulstijn, 2001). Nation (2022) states that guessing (i.e., inference) is the most useful strategy for learning vocabulary. He states that the guessing strategy involves interacting with the context using their world knowledge and common sense, and trying to guess the meaning of the unknown words that they encounter. Nation claimed, “the skills and conditions needed for guessing from context are the same skills and conditions needed for reading with good comprehension” (Nation, 2022, p. 403). Guessing from the context (“Context of Situation” in Halliday’s terms) and interacting with world knowledge (“Context of Culture” in Halliday’s terms, 1999) are essential elements which learners require for good inference. *Manga* provide the opportunities for learners to interact with the context that is created by the image and then guess the meaning of the unknown word. Nation stated, “[a] guess from context typically results in small increases in knowledge of the word, but this knowledge accumulates with each guess as long as there is plenty of comprehensible input” (Nation, 2022, p. 403). Therefore, instructors of JWL are encouraged to give opportunities to students to be exposed to more inference moments. As mentioned, this can be attained by encouraging JWL learners to read level-appropriate *manga* by holding extensive reading time in class and outside class. At the same time, while students engage in reading, they should be encouraged to make a habit of inferring the meaning of unknown words, taking notes and confirming the meaning with a dictionary. To retain vocabulary, learners should be exposed to new words multiple times. Nation states, “training in guessing can occur during intensive reading” (Nation, 2022, p. 403). Students should be reading at their proficiency appropriate level, but at the same time, they should be exposed to opportunities to analyze the structure of the language and turn on the thinking in order to learn.

In addition to extensive and intensive reading opportunities, instructors of JWL can provide opportunities for learners to infer the meaning of unknown vocabulary and decipher what it may mean by providing text and images in the classroom. One idea is to present text and image in classroom PowerPoints when the class engages in a beginning-level reading task. By presenting text and image, instructors could create slides that make learners infer the target words by interacting with the text, image, and context. By providing enough comprehensible input and providing learners with inference opportunities, instructors can activate learning. This daily effort will train learners' inference strategy (Walters, 2004; Walters, 2006).

5.6.2 Importance of Repetition

The results of the current study indicated that *manga* has a positive effect on initial inference of unknown words. However, the participants did not retain the vocabulary after two weeks. This implies that *manga* is effective in initial exposure, but it is necessary to provide follow-up activities for learners to retain the vocabulary. The results also indicated that there was a steep decline to the vocabulary test score for *manga*. This shows that *manga* is effective for inference, but if there is no repetition or frequent encounter, learners easily forget the word even though the learner was able to infer the word correctly. This shows the importance of repetition. In the current study, the number of encounters was only once during the study in order to explore the effect of *manga* in learners' vocabulary retention. That did not lead to their retention of the new word in two weeks. Previous research affirmed that a number of exposures is needed to learn new words (Rott, 1999; Horst et al., 1998; Webb, 2007; Takaki, 2003; Webb & Chang, 2015). Nation (2022) also supports that repetition should occur in order to learn new vocabulary; in particular, he supports spaced repetition, in which learners read a lot in extensive reading, and as learners read more, they encounter the same word in different contexts. These inputs should

be supported by the context and should be focused on vocabulary, so that learners can infer the meaning of the word reflecting the context. It is suggested that it is best to provide opportunity to help learners infer the new words by providing enough context to assist their inference, provide immediate feedback to confirm their inference, and expose learners to the same word in different contexts.

5.6.3 Importance of Output

Once learners establish comprehensible input and repetition to consolidate one's learning, output activities are needed to confirm one's understanding of the input is correct. Webb and Chang indicated that in addition to repetition, learners should engage in activities that they use the newly learned vocabulary (Webb & Chang, 2015). Nation (2022) states the importance of meaning-focus which is related to speaking and writing. Meaning-focus output forces learners to put their newly learned vocabulary into use. For learners to internalize the learning, instructors should target the material to be a slightly above their current level. These activities include problem-solving speaking such as role plays (Nation, 2013b; Nation, 2022). These production activities reinforce the input that learners gained through inference and their understanding and will solidify their learning by going through negotiating meaning and newly given context (Nation, 2022).

In summary, for the best way to develop vocabulary, instructors of world language should provide plenty of opportunity that learners can infer meaning of unknown words, provide immediate feedback to confirm their understanding. Once the input is established, instructors should provide opportunities that learners are exposed to the same word in different context and different usage as well as provide chances that learners can produce language by using the new vocabulary.

5.7 Future Study

The current study investigated to what extent *manga* influence one's inference of new vocabulary. The results indicated that *manga* has positive effect on one's initial inference of a word. The study did not investigate the different kinds of relationships and learners' processing between the text and the image. For example, in what arrangement of text and image can learners easily infer and retain the meaning of the unknown word? Halliday's Systemic Functional Linguistics (SFL) (Halliday, 1978; Halliday, 1989; Hori, 2006; National Center for Research Method, 2012) can be used in analyzing and coding the intertextuality that appears in the reading of *manga*. Vungthong et al. (2017) studied how images affect children's learning vocabulary in English as they appeared in song videos in Thailand using one of Halliday's metafunctions, ideational function. Future studies should investigate whether the text and image arrangement affect learners' inference and retention, and how instructors should present visual material in the classroom.

This study was conducted among second semester JWL students. Future studies should investigate how *manga* affect learners' vocabulary acquisition at different proficiency levels and whether there is any difference among different levels of proficiency. Also, the study only investigated JWL learners' vocabulary acquisition, but future research should investigate if this phenomenon is the same for different language learners as well as first language learners.

Another idea is to investigate how instructors should guide learners' inference strategy or how learners should engage in intensive reading. The current study did not instruct learners in how they should infer unknown vocabulary. Given that the researcher asked participants to infer the meaning and had them answer by typing their answer (rather than through multiple choice, or close test) made participants more aware of the context. Walter's (2006) study indicated that

learners who were trained to use strategies to infer meaning, performed significantly better in their reading comprehension post-test compared to other groups. Walter (2006) studied inferring strategies' effect from context on reading comprehension based on Clark & Nation's strategy (1980, p. 212). Clark and Nation (1980) suggested an inference strategy of five steps: 1) to figure out the part of speech of the unfamiliar word; 2) to analyze the grammar of the sentence and reflect on the role of the unfamiliar word; 3) to examine the context before and after the unfamiliar word; 4) to make an inference; 5) to check the inference. Future research could delve into the relationship between these strategies and *manga* texts, and how instructors should train JWL learners when JWL learners read *manga*.

Nation (2022) stated that learners can succeed in guessing from context if the text contains within 2% of unfamiliar words. This statement applies to regular text without images. Future research should investigate whether this ratio applies to the reading of *manga*. *Manga* assists by providing more/better context, which learners must then examine to see how the unfamiliar words are explained by this context. *Manga* may better assist with inferring more unknown words as compared to regular text. However, the ratio of the unknown words per entire text and the effect for retention should be examined in future research.

Researchers conducting longitudinal research should examine learners' vocabulary development at the advanced level. Future research should explore whether learners who were exposed to *manga* at the beginning levels are able to build up their reading proficiency to the advanced level and read abstract concepts when they become advanced-level learners.

6. CONCLUSION

This study has shown how *manga*'s multimodality, and especially its context-building nature, affected JWL learners' vocabulary acquisition. Participants were second-semester students, from two different universities in the US, taking Japanese as a part of their major or as an elective subject. The tasks given in the study were not included in their regular classroom curriculum and they participated voluntarily. Five data collection rounds were conducted between spring 2021 and spring 2022, with each round lasting four weeks. This was a quantitative study implemented with an experimental two-period, two-sequence crossover design for its advantage of removing inter-subject variability while also having a statistical high power (Lim & In, 2021). The participants in each data collection process were randomly assigned into two groups: the group that read *manga* in the first week read the text with an English glossary in the second week; conversely, the group that read the text with an English glossary in the first week switched to reading *manga* in the second week. Each reading text included two underlined words and participants were asked to infer the meaning of those two words. Participants read four stories per day over four days. These readings were done in weeks one and two. The third week was a vocabulary memory test of the week one reading, and the fourth week was a vocabulary memory test of the week two reading. In the end, each participant read two different types of texts. The underlined vocabulary words used in the readings had not been introduced in any class as of the time of data collection.

This study suggested that *manga* is effective in supporting the inferring of unknown words due to its context-building nature, and this is aligned with previous studies of multimodality and vocabulary acquisition research. Multimodality helps build context (Halliday, 1989; Kress & van Leeuwen, 2006; Jewitt, 2014; Jewitt, Bezemer, & O'Halloran, 2016), and

context is needed for vocabulary acquisition (Nation, 2022) and language learning (Halliday, 1999; Nation, 2022). This study also confirmed that *manga* can be used as legitimate extensive reading material, on the condition that readers are exposed to the appropriate level of material. It was expected that the time participants spent inferring the meaning of underlined words through *manga* would be shorter when compared with the English glossary reading. However, the results indicated that there was no significant difference in time spent between the different text types. The results also showed there was no significant difference in vocabulary retention scores between the two different text types. This suggested that *manga* is effective for the initial inference; however, follow-up activities and output activities are needed for longer retention. This result aligns with Laufer and Hulstijn's Involvement Load Hypothesis, in which learners of a second language retain vocabulary better when they are exposed to higher cognitive involvement activities including three factors such as need, search and evaluation (Laufer & Hulstijn, 2001).

The following section summarizes the outcomes of each research question and their corresponding explanations. The findings associated with the first research question are 1) how *manga* builds context and increases one's ability to make inferences, 2) *manga* as a multimodal text, and 3) how inference is required for language learning. The second research question and results will be summarized based on the expected and yielded results. Finally, we will see how the outcomes of the third research question are linked to Dual Coding Theory and Involvement Load Hypothesis, and their pedagogical implications.

6.1. Summary of Findings

6.1.1 First Research Question: Vocabulary Inference Through Texts

The first research question addressed *manga*'s ability to create context and how it affects the learners' inference of unfamiliar words. The results of the repeated-measure t-test indicated a statistically significant difference between the two types of text: *manga* and text with English glossary. The results showed the effectiveness of *manga* in participants' inference of words. *Manga* supported learners more in building context. *Manga*'s effectiveness in inference will be explained in the following points: 1) how *manga* builds context and helps with inference, 2) *manga* as multimodal text, and 3) how inference is needed for language learning to occur.

6.1.1.1 *Manga* and SFT

- 1) Inference is needed for language learning; to be able to infer, context is needed;
manga provide context

The positive results of *manga*'s effect on inference are attributed to the fact that *manga* provides context through its imagery. Halliday (1999) defined three elements how natural language is delivered through context. When people converse with each other, there is "Field," which is the topic and the purpose of the conversation; there is "Tenor" which involves the relationships between those taking part in the conversation; and there is "Mode," which indicates the method of communication. Natural language contains these elements and *manga*, with its combined text plus imagery, also contains these elements. By extension and as supported by Halliday's SFT, *manga* has the three elements that appear in language occurrence and so for building context. *Manga* has the advantage when compared to other types of texts, such as texts with glossaries. The opportunity of providing context creates comprehensible input and a

noticing moment occurs where learners take the first step in acquiring vocabulary. Nation called this “meaning-focus input” and tells us it leads to learning language (2022).

6.1.1.2 Multimodality and *Manga*

The current study on the text and image in *manga* connects with previous research of multimodality: how different modes interact and how learners/readers/speakers interact with various modes to create a meaning-making process (New London Group, 1996; Duncum, 2004; Siegel, 2012; Bazalgette and Buckingham, 2013; Jewitt, 2014). The multimodality study considers the “interactions” of readers and texts utilizing different modes. This intertextuality supports the negotiation of meaning between text and image and is how meaning is made. Halliday claimed this meaning-making occurs in interpreting the intertextuality. He stated, “[m]eaning arises from the friction of between the two” (Halliday, 1989, p. 47). It is this phenomenon that appears between the *manga* reader and the *manga* itself.

Different learners bring their “affordance” (Kress, 2010; National Center for Research Methods, 2012) or “potential” (Halliday, 1999) when interpreting the meaning of text. Therefore, the understanding of text may have some range of interpretation. The variations within each “affordance” or “potential” could be due to differences in one’s “context of culture” (their pre-existing knowledge) and/or the “context of situation” (Halliday, 1999). These affordances or potentials are revealed in one’s inference of words, which likely had some variation in the study. The people who engage in reading or conversing with someone else continually go through this process, creating meaning as they interact with various modes in texts.

Further, the arrangement of text and images that support the language occurrence are skillfully presented in *manga*. Readers of *manga* engage both text and image, interact and

negotiate with them, and create meaning-making moments. The meaning-making moment becomes the meaning-focus input according to Nation (2022).

6.1.1.3 Context and Inference

The necessity of context in world language education has been discussed in previous research (Clarke & Nation, 1980; Halliday, 1999; Hunt & Beglar, 2002; Nation, 2015, 2022). Without context, one cannot interpret any isolated spoken or written languages properly (Halliday, 1999). To infer the meaning of unknown words or to predict the direction of a text, or of spoken language, Halliday claimed the central importance of context. Context provides the comprehensible input (Krashen, 1982). *Manga* creates this comprehensible input as context through visual presentation of both texts and images. You can visualize the character's voice: bolded or large fonts represent loud voice; solid speech bubbles represent the character's actual speech; dotted lines represent the character's thoughts. You can visualize these thoughts through body language and facial expressions which show emotions. This visual information is accompanied with either casual or polite speech, which together allows readers to make meaning and understand what is happening in the scene. This way of delivering context is not achieved by other types of text or media. With these features, *manga* is uniquely effective in creating context that supports learners' inference of unknown words.

Researchers have used different words to convey the importance of inference. The following researchers all agree that inference is needed to improve proficiency. For example, Halliday used the word "construe" (Halliday, 1985) while Schmidt suggested Noticing Theory (1990). Nation (2022) used meaning-focus input, that is achieved after inference while Krashen used Comprehensible Input. Using Halliday's words, learning occurs when learners:

(1) process and produce text; (2) relate it to, and construe from it, the context of situation; (3) build up the potential that lies behind this text and others like it; and (4) relate it to, and construe from it, the context of culture that lies behind that situation and others like it. (Halliday, 1999, p. 23)

For learning new vocabulary through reading, learners need context to decipher the missed information via inference. When reading *manga*, learners undergo the same process when they reach the meaning-making moment. Specifically, they experience the process of 1) interacting with the text and image, 2) using known knowledge to infer the situation, 3) thinking about meaning potentials by interpreting this information, and 4) inferring the meaning of the text. *Manga* allows readers to experience this process with visual images, without going through more textual information, which JWL learners may not yet possess. For these reasons, *manga* was effective for inferring unknown words. This feature supports learners' inference of new vocabulary and leads to a correct understanding of how the word is used in a particular context. Therefore, *manga*, as multimodal material, supports the aforementioned four processes in constructing context and facilitating learning.

6.1.2 Second Research Question: Time Spent Inferring Unknown Words

The results of the second research question raised some concerns about the methods taken to measure the time spent taking the vocabulary test. Some participants spent an unrealistic number of hours reading/testing, and so these numbers were considered to be outliers and had to be removed. One of the limitations of the study was that it could not be conducted in a lab setting and therefore the results did not yield reliable data in the form of time measurements. Therefore, analysis and interpretation of this data should be done with caution. The second research question delved into the effectiveness of *manga* to infer unknown words. The time that

participants spent reading *manga* and text with English glossary was compared. However, the Wilcoxon signed rank test indicated that there was no significant difference between the median of the time that participants spent reading *manga* versus time spent reading with English glossary. Because of the advantage that *manga* has in building context as discussed previously, this result was not expected.

6.1.3 Third Research Question: Retaining Vocabulary After Two Weeks

The results of the third research question delved into *manga*'s effectiveness for vocabulary retention. Based on the Dual Coding Theory by Paivio (1980, 1988, 2014; Sadoski & Paivio, 2013), it was hypothesized that the two modes seen in *manga* (imagery and text) activate learners' memory, and that learners would retain more vocabulary after two weeks. The results, however, showed that there was no significant difference between how these two forms of text (*manga* and text with glossary) assisted with retaining vocabulary. The fact that *manga* did not provide any advantage over text with glossary contradicted the studies done by Paivio and others that suggested an advantage when having two modes (Aghaei & Goughani, 2016; Başal et al., 2016; Tabatabaei & Shams, 2011). There are two factors that may explain this contradiction. One is that glossaries are also effective in supporting a learners' inference of context and effective in helping with the inference of new vocabulary (Jacobs, et al., 1994; Serrand, 2013). A second factor is that *manga* may not create enough cognitive involvement in learners who engage in deciphering meaning. According to the Involvement Load Hypothesis (Laufer, & Hulstijn, 2001), the more a learner invests in deeper processing to learn, the better they retain the information. It was rather easy for participants to access the comprehensible input through *manga* and this ease of attainment may not have given enough cognitive load to be sufficiently effective.

These results show that, while *manga* was effective for the initial inference, the effect was lost within two weeks. This was also true of the English glossary text; however, the drop was not as significant as with *manga* text. The fact that the vocabulary score through both readings had a steep drop shows that learners need repetition for both text types (more so with *manga*). These results are aligned with the principle that learners of world languages need repetition to acquire vocabulary (Rott, 1999; Horst et al., 1998; Webb, 2007; Takaki, 2003 as cited in Webb & Chang, 2015) and output activities (Webb & Chang, 2015).

6.2 Conclusion

In conclusion, this study attempted to prove *manga*'s effectiveness for learning new vocabulary through reading among beginning level JWL learners. While further investigation is still needed to examine the effectiveness of time spent reading *manga* versus reading text with glossary, the results suggested that *manga* is still effective for building the very context that learners need to infer unknown vocabulary. When participants read *manga*, their inference was significantly better than with English glossary; however, their retention saw a steep decline. This indicated *manga*'s advantage lies in the initial inference, but it requires follow up activities to be able to retain the learned vocabulary. These findings revealed a potential use of *manga* inside and outside of the JWL classroom, as well as in any world language classroom.

Use of *manga* as an educational resource is boundless. *Manga* or graphic novels have been underutilized in JWL and other language instruction cases. The multimodal nature of *manga* should qualify it for consideration as a useful resource for increasing learners' vocabulary in the beginning levels. The context that is built into *manga* can help learners to have meaning-focus input (comprehensible input, noticing) as they interact with the text and their own world knowledge. This input is needed for learners to learn the language.

The results of this study support the case that *manga* should be used for extensive reading provided they are at the appropriate level. In this context, Yoshimura's study (Yoshimura & Sharon, 2017) suggests that a carefully implemented yet gradual introduction of *manga*, as seen in graded readers, could prove beneficial for JWL learners.

Nation (2022) stated that up to 2% of unfamiliar words is an appropriate proportion as learners read; however, *manga* may allow us to exceed this percentage given its context-building characteristics. This is desirable for future work. Also, future studies should further examine the relationship between the presentation of texts and images, and how that relationship helps learners to acquire new vocabulary.

One more aspect of this study is how *manga* acts to motivate learners. The fact that many learners are already consumers of Japanese popular culture may have affected the results positively. This could very well imply that using *manga* in JWL instruction, in and of itself, can boost learners' motivation. For all the complexities of the Japanese writing system, having images accompany texts may make it appear less "scary."

Lastly, the ultimate goal would be to see more people learn a different language so as to expand and spread compassion through their understanding of different cultures. If *manga* promotes world language acquisition and reduces barriers to language learning, there may be an increase in people willing to learn a new language. This holds particularly true for Category IV languages, like Japanese, which are recognized for their difficulty in being learned by English-speaking individuals.

I agree with Byram's proposal to reexamine the purpose of world language education. Byram stated that world language education must serve purposes that are both educational and utilitarian (Byram, 2010). This echoes the philosophy of the World Readiness Standards set forth

by ACTFL and the Council of Europe (CEFR)’s premise of “Language in Education, Language for Education (2009, as cited in Byram, 2010). Language education should play an important role in educating American youth holistically and provide “whole-person” education. In addressing escalating global challenges such as the Covid-19 pandemic and environmental issues, the ability to collaborate across cultures has emerged as a paramount skill of the 21st century (Tohsaku et al., 2021). More people should gain intercultural knowledge and foster their critical thinking skills. A world language class is an ideal place to engage students in the above-mentioned skills. It can provide them with a range of readings, authentic popular culture references, and multimodal material to be accessed from both within and outside the classroom. This movement toward critical thinking skills and intercultural knowledge can be already seen in recent emergence of multiliteracy studies, which originated from multimodality pedagogy.

Manga could be an excellent educational resource for such pedagogy as it is effective in establishing context, inferring vocabulary and sustaining motivation. Due to the diverse range of readership and genres, *manga* can facilitate linguistic knowledge as well as develop critical thinking skills, intercultural skills, and stimulate intercultural communication. Learning a different language is especially challenging if the learner has never studied one or is not equipped with language learning strategy. The majority of American students are not enrolled in a world language class, and many Americans have never studied a world language. Reading *manga* or reading graphic novels in the target language may be more accessible for learners and may become a good starting point to learning a world language.

A world language class is a good place to engage students in the above-mentioned skills and can provide them with various readings, authentic pop-culture references, and multimedia material to be accessed from both inside and outside the classroom. My hope is that more people

become interested in learning a different language and that the US education system will increase its support of world language learning. I also hope that implementing *manga* or graphic novels into language education will generate more well-rounded individuals as demanded by our globally interconnected 21st century world.

7. REFERENCES

ACTFL (2012). Proficiency Guidelines:

<https://www.actfl.org/uploads/files/general/ACTFLProficiencyGuidelines2012.pdf>

ACTFL (n.d) *Assigning CEFR Ratings to ACTFL Assessments*

https://www.actfl.org/uploads/files/general/Assigning_CEFR_Ratings_To_ACTFL_Assessments.pdf

Aghaei, K. & Goughani, F. (2016). Multimodal Pedagogy and L2 Vocabulary Retention.

International Journal of English Language & Translation Studies. 4(3), 142-153.

Retrieved from (Ketabi & Shahraki, 2011; Senoo, Y., & Yonemoto, K., n.d.)

American academy of arts & sciences (2020). The Importance of Languages in Global Context: An

International Call to Action. Retrieved December 10, 2020, from

<https://www.amacad.org/sites/default/files/media/document/2020-11/Joint-Statement-on-Languages.pdf>.

American Academy of Arts and Sciences (2017). America's Languages: Investing in Language

Education for the 21st Century. Retrieved December 10, 2020, from

<https://www.amacad.org/publication/americas-languages>.

American Councils for International Education. (2017). *The National K-12 Foreign Language*

Enrollment Survey Report [dataset].

<https://www.americancouncils.org/sites/default/files/FLE-report-June17.pdf>

American Council on the Teaching of Foreign Language (ACTFL) (2015). Core Practices for

World Language Learning. Retrieved December 10, 2019, from

<https://www.actfl.org/sites/default/files/about/Core%20Practices.jpg>.

- American Council on the Teaching of Foreign Language (ACTFL) (2015). World Readiness Standards for Learning Languages. Retrieved from December 10, 2019, from <https://www.actfl.org/publications/all/world-readiness-standards-learning-languages>.
- Azen (2016) EdPsy 624 Classnotes: Type I and Type II errors
- Azen (2017) EdPsy 724 Classnotes: Concepts in Null Hypothesis Testing: Error Types and Power
- Azen (2017) EdPsy 724 Classnotes: One-Way Analysis of Variance (ANOVA)
- Azen (2017) EdPsy 724 Lab 3: T-Tests in SPSS & SAS.
- Baker, C. (2011) Foundations of Bilingual Education and Bilingualism (Bilingual Education & Bilingualism) 5th Edition
- Banno, E., Ikeda, Y., Ohno, Y., Shinagawa, C., & Tokashiki, K. (2011) *Genki: An Integrated Course in Elementary Japanese*. Tokyo: The Japan Times.
- Başal, A., Aytan, T., & Demir, I. (2016). Teaching vocabulary with graphic novels. *English Language Teaching*, 9(9), 95-109. doi:10.5539/elt.v9n9p95
- Bazalgette, C. & Buckingham, D. (2013). Literacy, media and multimodality: a critical response. Retrieved from <https://doi.org/10.1111/j.1741-4369.2012.00666.x>
- Bezemer, J., & Jewitt, C. (2018). Multimodality: A guide for linguists. In *Research methods in linguistics* (pp. 1–3).
- Bitz, M. (2004). The comic book project: Forging alternative pathways to literacy. *Journal of Adolescent & Adult Literacy*, 47(7), 574-586.
- Brenner, R. (2007). *Understanding manga and anime*. Westport, CT: Libraries Unlimited.
- Byram, M. (2010). Linguistic and Cultural Education for Building and Citizenship. *The Modern Language Journal*, 94(ii), 315–336.

- Byram, M., & Wagner, M. (2018). Making a difference: Language teaching for intercultural and international dialogue. *Foreign Language Annals*, 51(1), 140–151.
<https://doi.org/10.1111/flan.12319>
- Byram, M. (2021). *Teaching and assessing intercultural communicative competence: Revisited* (2nd edition). Multilingual Matters.
- Carter, J. B. (2007). *Building literacy connections with graphic novels: Page by page, panel by panel / edited by james bucky carter* Urbana, Ill. : National Council of Teachers of English.
- Chiswick, B. & Miller, P. (2004). *Linguistic distance: A quantitative measure of the distance between english and other languages* Institute for the Study of Labor (IZA).
- Clarke, D. F., & Nation, I. S. P. (1980). Guessing the meanings of words from context: Strategy and techniques. *System*, 8(3), 211–220. [https://doi.org/10.1016/0346-251X\(80\)90003-2](https://doi.org/10.1016/0346-251X(80)90003-2)
- Cohen, A. D. (1991). *Language learning: Insights for learners, teachers, and researchers* (2. [pr.]). Heinle & Heinle.
- Cohen, A. D., & Macaro, E. (Eds.). (2007). *Language learner strategies: Thirty years of research and practice*. Oxford University Press.
- Desmond, J. (2012). Americanization. In H. K. Anheier & M. Juergensmeyer (Eds.), *Encyclopedia of global studies* (Vol. 1, pp. 63-64). Thousand Oaks, CA: SAGE Publications, Inc. doi: 10.4135/9781452218557.n18
- Eaton, S.E. (2010). *Global Trends in Language Learning in the Twenty-first Century*. Calgary: Onate Press.

- Farias, M., Obilinovic, K., & Orrego, R. (2011). Pontos de possível diálogo entre aprendizado multimodal e ensino-aprendizado de línguas estrangeiras. *Trabalhos em Linguística Aplicada*, 50(1), 133-151. <https://dx.doi.org/10.1590/S0103-18132011000100008>
- Farias, M., Obilinovic, K., Orrego, R., & Gregersen, T. (2014). Evaluating types and combinations of multimodal presentations in the retention and transfer of concrete vocabulary in EFL learning. *Revista Signos; Rev.Signos*, 47(84), 21-39.
doi:10.4067/S0718-09342014000100002
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39, 175–191. <https://doi.org/10.3758/BF03193146>
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2021). G*Power 3.1, a Manual (Version 3.1) [Manual]. Universität Kiel. <https://www.psychologie.hhu.de/arbeitsgruppen/allgemeine-psychologie-und-arbeitspsychologie/gpower>
- Fox, R., Corretjer, O., & Webb, K. (2019). Benefits of foreign language learning and bilingualism: An analysis of published empirical research 2012–2019. *Foreign Language Annals*, 52(4), 699–726. <https://doi.org/10.1111/flan.12424>
- Galman, S. (2009). The truthful messenger: visual methods and representation in qualitative research in education. *Qualitative Research*, 9(2), 197–217.
- Gass, S. (1999). Discussion: Incidental vocabulary learning. *Studies in Second Language Acquisition*, 21(2), 319-33. doi:10.1017/S0272263199002090

- Goldberg, D., Looney, D., Lusin, N., & Modern Language Association of America. (2015). *Enrollments in Languages Other Than English in United States Institutions of Higher Education, Fall 2013* [Web Publication].
https://apps.mla.org/pdf/2013_enrollment_survey.pdf
- Gravett, P. (2004). *Manga: Sixty years of Japanese comics*. London: Laurence King Publishing.
- Gu, P. (2003). Vocabulary learning in a second language: Person, task, context and strategies. *TESL-EJ*, 7(2), 1–25.
- Gu, Y., & Johnson, R. K. (1996). Vocabulary Learning Strategies and Language Learning Outcomes. *Language Learning*, 46(4), 643–679. <https://doi.org/10.1111/j.1467-1770.1996.tb01355.x>
- Halliday, M. A. K., & Hasan, R. (1989). *Language, context and text: Aspects of language in a social-semiotic perspective* (2nd ed.). Oxford: Oxford University Press.
- Halliday, M. A. K. (1999). The notion of “context” in language education. In M. Ghardessy (Ed.), *Text and context in functional linguistics* (pp. 1–24). Benjamins.
- Hanabusa, N., & Juhn, H.-J. (2018). Japanese Extensive Reading Courses at a U.S. University: Meaning-focused Input and Output Facilitated by a Japanese Instructor-Librarian Team. *Extensive Reading SIG by the Japan Association of Language Teaching (JALT)*, 4.
<https://jalt-publications.org/content/index.php/jer/article/view/103>
- Hansen, K. S. (2012). In defense of graphic novels. *English Journal*, 102(2), 57-63.
- Hatasa, Y., Hatasa, K., & Makino, S. (2016) *Nakama 2, Third Edition: Intermediate Japanese: Communication, Culture, Context*. Boston: Cengage.
- Hori, M. (2006). *Kotoba nitsuite kangaeu: an invitation to systemic functional linguistics in Kotoba wa ikiteiru*. Tokyo: Kuroshio Publishers.

- Horst, M., Cobb, T., & Meara, P. (1998). Beyond A Clockwork Orange: Acquiring second language vocabulary through reading. *Reading in a Foreign Language*, 6, 323-335.
- Hotta, Y. & Obata, K. (1999). Hikaru no Go. *Shonen Jump*. 52-53. Tokyo: Shueisha.
- Howell, D. (2013). Statistical Methods for Psychology. Wadsworth.
- Hunt, A., & Beglar, D. (2002). Current Research and Practice in Teaching Vocabulary. In J. C. Richards & W. A. Renandya (Eds.), *Methodology in Language Teaching* (1st ed., pp. 258–266). Cambridge University Press. <https://doi.org/10.1017/CBO9780511667190.036>
- Japan Foundation. (2017a). Survey Report on Japanese-language Education Abroad 2015. Retrieved December 14, 2020, from https://www.jpf.go.jp/j/project/japanese/survey/result/dl/survey_2015/Report_all_e.pdf.
- Japan Foundation. (2018). Survey report on Japanese-language education abroad 2018. https://www.jpf.go.jp/j/project/japanese/survey/result/dl/survey2018/Report_all_e.pdf.
- Jewitt, C. (2014). *The Routledge handbook of multimodal analysis.*, New York, NY: Routledge.
- Jewitt, C., Bezemer, J., & O'Halloran, K. (2016). *Introducing multimodality*, New York, NY: Routledge.
- Ketabi, S. & Shahraki, S. (2011). Vocabulary in the approaches to language teaching: from the twentieth century to the twenty-first in the Journal of Language Teaching and Research, 2 (3), 726-731. doi:10.4304/jltr.2.3.726-731
- Koeki Shadan Hojin Zenkoku Shuppan Kyokai Shuppan Kagaku Kenkyujo. (2023). *News Release Shuppan Geppo*. <https://shuppankagaku.com/wp/wp-content/uploads/2023/02/%E3%83%8B%E3%83%A5%E3%83%BC%E3%82%B9%E3%83%AA%E3%83%AA%E3%83%BC%E3%82%B92302.pdf>

- Kotobank. (n.d.) 起承転結. In *kotobank.jp dictionary*. Retrieved November 22, 2023, from <https://kotobank.jp/word/%E8%B5%B7%E6%89%BF%E8%BB%A2%E7%B5%90-12404>.
- Krashen, S. (1989). We Acquire Vocabulary and Spelling by Reading: Additional Evidence for the Input Hypothesis. *The Modern Language Journal*, 73 (4), 440-464.
<https://www.jstor.org/stable/326879>. Accessed on December 23, 2020.
- Krashen, S. D. (2004). *The power of reading: Insights from the research / Stephen D. Krashen*
- Kress, G. (2010). *Multimodality: A social semiotic approach to contemporary communication*. Abingdon: Routledge.
- Kress, G. & van Leeuwen, T. (2006). *Reading images: The grammar of visual design*. Routledge.
- Kuenzi, J. (2008). Science, Technology, Engineering, and Mathematics (STEM) Education: Background, Federal Policy, and Legislative Action.
<https://digitalcommons.unl.edu/crsdocs/35/>
- Kumano, N. & Hirokaga, M. (2008). “‘Anime, manga’” *chosa kenkyu-chiiki jijo to nihongo kyozei*” *Kokusai koryukikin nihongo kyoiku kiyo dai yon go*, 55-69. Retrieved December 14, 2020, from https://dl.ndl.go.jp/view/download/digidepo_7800544_po_05.pdf?contentNo=1&alternativeNo=
- Kuno, S. (1973). *The structure of the japanese language*. Cambridge, Mass.: MIT Press.
- Laerd Statistics (2017). Statistical tutorials and software guides. Retrieved from <https://statistics.laerd.com/>

- Laerd Statistics (2015). Wilcoxon signed-rank test using SPSS Statistics. Statistical tutorials and software guides. Retrieved from <https://statistics.laerd.com/>
- Laufer, B. & Hulstijn, J. (2001). Incidental vocabulary acquisition in a second language: the construct of task-induced involvement. *Applied linguistics*. 22 (1). 1-26.
- Lim, C.-Y., & In, J. (2021). Considerations for crossover design in clinical study. *Korean Journal of Anesthesiology*, 74(4), 293–299. <https://doi.org/10.4097/kja.21165>
- Liu, D. (2015). A critical review of krashen's input hypothesis: three major arguments. *Journal of education and human development*. 4 (4). 139-146. DOI: 10.15640/jehd.v4n4a16
- Looney, D. & Lusin, N. (2019). Enrollments in languages other than English in the united states institutions of higher education, summer 2016 and fall 2016: final report. Modern Language Association of America. Retrieved December 15, 2020 from <https://www.mla.org/content/download/110154/2406932/2016-Enrollments-Final-Report.pdf>.
- McCloud, S. (2008). *Understanding comics / Scott McCloud* New York: Harper Perennial: Paw Prints.
- Mills, K. (2015). Literacy theories for the digital age: social, critical, multimodal, spatial, material and sensory lenses. New York: Multilingual matters.
- Moradan, V., & Vafaei, M. (2016). The effect of glosses on incidental vocabulary learning of Iranian EFL learners. *International journal of applied linguistics & English literature*. 5 (6), doi:10.7575/aiac.ijalel.v.5n.6p.34.
- Morrell, E. (2002). Toward a critical pedagogy of popular culture: Literacy development among urban youth. *Journal of Adolescent & Adult Literacy*, 46(1), 72-77.

- Muraoka, Y. (2012). 気づきを高める英語教育: Noticing enhancement in English education. *Kyoiku Kenkyu*. 54 (3). 233-244. Retrieved December 22, 2020, from <https://id.ndl.go.jp/bib/023906517>.
- Nation, P. (2001). Learning vocabulary in another language. Cambridge: England; Cambridge University Press.
- Nation, P. (2015). Principles guiding vocabulary learning through extensive reading. *Reading in a Foreign Language*, 27(1), 136–145.
- Nation, P. (2022). Teaching and learning vocabulary. In E. Hinkel, *Handbook of Practical Second Language Teaching and Learning* (1st ed., pp. 397–408). Routledge. <https://doi.org/10.4324/9781003106609-33>
- National Center for Research Methods. (2012). Retrieved December 1, 2019, from <https://multimodalityglossary.wordpress.com/mode-2/>
- National Standards in Foreign Language Education Project (NS-FLEP) (2015). World-Readiness Standards for Learning Languages. Retrieved December 25, 2020, from <https://www.actfl.org/sites/default/files/publications/standards/World-ReadinessStandardsforLearningLanguages.pdf>
- NCSSFL, & ACTFL. (2017). *NCSSFL-ACTFL Can-Do Statements*. <https://www.actfl.org/educator-resources/ncssfl-actfl-can-do-statements>
- Norton, B. (2003). The motivating power of comic books: Insights from archie comic readers. *Reading Teacher*, 57(2), 140-47.
- Ortega, L. (1999). Language and equality: Ideological and structural constraints in foreign language education in the U.S. in Ortega, L. (1999). In Ortega L. (Ed.), *Language and equality: Ideological and structural constraints in foreign language education in the U.S.*

- Paivio, A., Clark, J. M., & Lambert, W. E. (1988). Bilingual dual-coding theory and semantic repetition effects on recall. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 14(1), 163-172. doi:10.1037/0278-7393.14.1.163
- Paivio, A., & Desrochers, A. (1980). A dual-coding approach to bilingual memory. *Canadian Journal of Psychology/Revue Canadienne De Psychologie*, 34(4), 388-399. doi:10.1037/h0081101
- Pappamihel, N. E., & Walser, T. M. (2009). English Language Learners and Complexity Theory: Why Current Accountability Systems Do Not Measure Up. *The Educational Forum*, 73(2), 133–140. <https://doi.org/10.1080/00131720902739544>
- Peker, H, Regalla, M, Cox, TD. Teaching and learning vocabulary in context: Examining engagement in three prekindergarten French classrooms. *Foreign Language Annals*. 2018; 51: 472– 483. <https://doi-org.revproxy.brown.edu/10.1111/flan.12338>
- PEW Research Center. (2018, August 6). *Most European students are learning a foreign language in school while Americans lag*. <https://www.pewresearch.org/short-reads/2018/08/06/most-european-students-are-learning-a-foreign-language-in-school-while-americans-lag/>
- Plass, J. L., Chun, D. M., Mayer, R. E., & Leutner, D. (1998). Supporting visual and verbal learning preferences in a second-language multimedia learning environment. *Journal of Educational Psychology*, 90 (1), 25-36.
- Rapp, D. N. (2011). Comic books' latest plot twist: Enhancing literacy instruction. *Phi Delta Kappan Magazine*, 93(4), 64-67. doi:10.1177/003172171109300416
- Rudolph, J. L. (2014). Dewey’s “Science as method” a century later. *American Educational Research Journal*, 51(6), 1056-1083. doi:10.3102/0002831214554277

- Rumbaut, R. & Massey, D. (2013). Immigration and language diversity in the United States.
- Sadoski, M. (2013). *Imagery and text: A dual coding theory of reading and writing / Mark Sadoski and Allan Paivio* (Second edition.). New York: Routledge.
- Salomone, R. (2010) True American: Language, Identity, and the Education of Immigrant Children. Harvard University Press
- Schmidt, R. W. (1990). The Role of Consciousness in Second Language Learning¹. *Applied Linguistics*, 11(2), 129–158. <https://doi.org/10.1093/applin/11.2.129>
- Schmidt, R. (2010). Attention, awareness, and individual differences in language learning. In W. M. Chan, S. Chi, K. N. Cin, J. Istanto, M. Nagami, J. W. Sew, T. Suthiwan, & I. Walker, Proceedings of CLaSIC 2010, Singapore, December 2-4 (pp. 721-737). Singapore: National University of Singapore, Centre for Language Studies.
- Science Direct. (n.d.). *Wilcoxon signed Ranks test*.
<https://www.sciencedirect.com/topics/medicine-and-dentistry/wilcoxon-signed-ranks-test>
- Senoo, Y., & Yonemoto, K. (2014). *Vocabulary learning through extensive reading: A case study*. 17(2), 1–22.
- Serrand, C. (2013). Vocabulary learning through reading: The effects of multimedia glosses for contextualized vocabulary use and acquisition [Doctoral dissertation, University of Alberta]. <https://doi.org/10.7939/R3WM1418G>.
- Shibatani, M. (1990). *The Languages of Japan*. Great Britain: Cambridge University Press.
- Shimizu, I. (1991). *Manga no rekishi*. Tokyo: Iwanami Shinsho.
- Shimizu, I. (2009). *Yonkoma manga*. Tokyo: Iwanami Shinsho.

Statistical Service Provided for *Figure 4.1 Individual Vocabulary Scores: Pretest and Inference Performance* by Moore, T. (2023) at UConn's Statistical Consulting Services.

Statistical Service Provided for *Figure 4.3 Individual Vocabulary Scores: Pretest, Inference and Retention Performance* by Moore, T. (2023) at UConn's Statistical Consulting Services.

Suchmacher, M., & Geller, M. (2012). Study Type Determination. In *Practical Biostatistics* (pp. 3–15). Elsevier. <https://doi.org/10.1016/B978-0-12-415794-1.00001-X>

Tabatabaei, O. & Shams, N. (2011). The effect of multimedia glosses on online computerized L2 text comprehension and vocabulary learning of Iranian EFL learners. In the *Journal of Language Teaching and Research*, Vol. 2, No. 3, 714-725. doi:10.4304/jltr.2.3.714-725.

Tajima, K. (2017). *Anime wo katsuyo shita nihongokyoiku no kanosei*.

Bull Joetsu Univ. Educ. Vol. 36 (2), Mar. 2017. Retrieved December 14, 2020, from

<https://core.ac.uk/download/pdf/147821377.pdf>

The Japan Times (2009). Lessons from when the bubble burst. Retrieved December 20, 2020, from:

<https://www.japantimes.co.jp/news/2009/01/06/reference/lessons-from-when-the-bubble-burst/#.Wtu-7NPwaqA>

Toku, M. (2001). What is *manga*?: The influence of pop culture in adolescent art. *Art Education*, 54(2), 11-17.

Tohsaku, Y.-H., Nazikian, F., & Park, J. (2021). *Social Networking Approach to Japanese*

Language Teaching: The Intersection of Language and Culture in the Digital Age (Y.-H.

Tohsaku, F. Nazikian, & J. Park, Eds.; 1st ed.). Routledge.

<https://doi.org/10.4324/9781003001157>

- Uno Tsunehiro, & Translated by Jeffrey C. Guarneri. (2015). Imagination after the Earthquake: Japan's Otaku Culture in the 2010s. *Verge: Studies in Global Asias*, 1(1), 114–136.
<https://doi.org/10.5749/vergstudglobasia.1.1.0114>
- United States Census: Detailed Language Spoken at Home and Ability to Speak English for the population 5 years and over: 2009-2013 (October, 2015)
<https://www.census.gov/data/tables/2013/demo/2009-2013-lang-tables.html>
- U.S. Department of Education. Science, Technology, Engineering, and Math, including computer science. Retrieved December 15, 2020, from
<https://www.ed.gov/stem#background>
- Varley, P. (2000). *Japanese Culture*. Honolulu, Hawaii: University of Hawaii Press.
- Verma, J.P., Verma, P. (2020). Use of G*Power Software. In: *Determining Sample Size and Power in Research Studies*. Springer, Singapore. https://doi.org/10.1007/978-981-15-5204-5_5
- Vungthong, S., Djonov, E. and Torr, J. (2017) Images as a Resource for Supporting Vocabulary Learning: A Multimodal Analysis of Thai EFL Tablet Apps for Primary School Children. *Tesol Quarterly*, 32-58. <https://doi.org/10.1002/tesq.274>
- Waring, R., & Takaki, M. (2003). At what rate do learners learn and retain new vocabulary from reading a graded reader? *Reading in a Foreign Language*, 15(2).
- Webb, S., & Macalister, J. (2013). Is Text Written for Children Useful for L2 Extensive Reading? *TESOL Quarterly*, 47(2), 300–322. <https://doi.org/10.1002/tesq.70>
- Webb, S. & Chang, Anna C-S (2015). Second language vocabulary learning through extensive reading with audio support: How do frequency and distribution of occurrence affect learning? *Language Teaching Research*, 19 (6), 667-686.

- Wiley, T. (1999). Comparative Historical Analysis of U.S. Language Policy and Language Planning: Extending the Foundations. in Ortega, L. (1999). In Ortega L. (Ed.), *Language and equality: Ideological and structural constraints in foreign language education in the U.S.*
- Within Subjects/Repeated Measures/Paired t. Retrieved May 20, 2020, from <http://web.pdx.edu/~newsomj/pa551/lecture8.htm>
- World-readiness standards for learning languages* (Fourth edition). (2015). National Standards in Foreign Language Education Project (NSFLEP).
- Yoshimura, Y., & Sharon, D. (2017). From Graded Readers to *Manga*: An Analysis of which books are popular in extensive reading. *PJPF 2017 Proceedings*, 222–233.

APPENDIX A

Consent Form

CONSENT FOR RESEARCH PARTICIPATION **Vocabulary Learning through Multimodal Materials**

KEY INFORMATION:

You are invited to take part in a (institution's name) research study. Your participation is voluntary.

PURPOSE: The purpose of this study is to understand to what extent different types of reading material affects the number of words that learners of Japanese can deduce and can retain.

PROCEDURES: You will be asked if you would like to participate in a vocabulary learning study which will last for four weeks (four days each week and up to 20 minutes per day). In the first week, you will be reading four short stories per day for four days (Monday to Thursday) and answering two questions per reading. Each reading contains approximately 200 Japanese hiragana characters, some of which are vocabulary you have not yet learned. The vocabulary in the readings are all covered in JAPN0200. You will be asked to deduce the meaning of unknown words immediately following the reading. There are two different types of readings, and you will not know which one you may be assigned first. In week two, you will switch reading types and as outlined above, you will read four short stories per day and answer two questions per reading. In weeks three and four, you will not read any new material and daily you will be asked to answer follow-up questions related to the meaning of the unknown words you learned in weeks one and two. The accuracy of the answers you provide in this study will be captured as data points in Canvas and recorded on a secure server. This data will be kept separate from the rest of the course data.

TIME INVOLVED: It takes approximately five minutes to read one story and answer the questions; your time will be up to 20 minutes per day. There is no time limit to answer questions.

COMPENSATION: You will not receive compensation for your time.

RISKS: There is risk that you may infer and memorize the incorrect meaning of some vocabulary words during the study. To correct this and confirm accurate learning, you will receive both types of readings and explanations after the study is complete.

BENEFITS: The vocabulary used in the readings are extracted from future course material to be covered later in JAPN0200 in spring 2021. Your participation in this study will allow you to get a head start on learning future vocabulary. However, there are no direct benefits to research participants for participating in this study.

ALTERNATIVES TO PARTICIPATION: Your participation is voluntary, and you may choose not to participate.

1. Researcher(s):

Atsuko Suga Borgmann is the Principal Investigator of this study. Atsuko Suga Borgmann is a Full-Time Senior Lecturer at X University and a Ph.D. candidate at the University of Wisconsin-Milwaukee. Atsuko Suga Borgmann can be reached via phone or email.

2. What is this study about?

This study is about vocabulary learning in a Japanese as a world-language classroom. You are being invited to join this study because of your current enrollment in beginning-level Japanese. The goal of the study is to better understand what curricular methods /materials/etc. support second language learners of Japanese in learning and retaining vocabulary in a short period of time. The results of the study will be analyzed and incorporated into my Ph.D. dissertation in Urban Education with a concentration in Curriculum and Instruction from the University of Wisconsin-Milwaukee. There will be no identifiable information contained within the dissertation.

3. What will I be asked to do?

The length of the study is four weeks. In the first week, you will be reading four short stories per day for four days (Monday to Thursday). Each reading contains approximately 200 Japanese hiragana characters, some of which are vocabulary you have not yet learned. The vocabulary in the readings are all covered in JAPN0200. You will be asked to deduce the meaning of unknown words immediately following the reading. There are two different types of readings, and you will not know which one you may be assigned first. In week two, you will switch reading types. It takes approximately five minutes to read and answer one story, up to 20 minutes per day. There is no time limit to answer questions. Your answers provided in this study will be recorded on a secure Canvas server and will be kept separate from the rest of the course data.

What will I do?					
Week 1					
Day 1	•Take a Pre-test of vocab set 1	•Read story 1 •Test on story 1 vocab	•Read story 2 •Test on story 2 vocab	•Read story 3 •Test on day 3 vocab	•Read story 4 •Test on story 4 vocab
Day 2		•Read story 5 •Test on story 5 vocab	•Read story 6 •Test on story 6 vocab	•Read story 7 •Test on story 7 vocab	•Read story 8 •Test on story 8 vocab
Day 3		•Read story 9 •Test on story 9 vocab	•Read story 10 •Test on story 10 vocab	•Read story 11 •Test on story 11 vocab	•Read story 12 •Test on story 12 vocab
Day 4		•Read story 13 •Test on story 13 vocab	•Read story 14 •Test on story 14 vocab	•Read story 15 •Test on story 15 vocab	•Read story 16 •Test on story 16 vocab
Week 2					
Day 1	•Take a Pre-test of vocab set 2	•Read story 17 •Test on story 17 vocab	•Read story 18 •Test on story 18 vocab	•Read story 19 •Test on day 19 vocab	•Read story 20 •Test on story 20 vocab
Day 2		•Read story 21 •Test on story 21 vocab	•Read story 22 •Test on story 22 vocab	•Read story 23 •Test on story 23 vocab	•Read story 24 •Test on story 24 vocab
Day 3		•Read story 25 •Test on story 25 vocab	•Read story 26 •Test on story 26 vocab	•Read story 27 •Test on story 27 vocab	•Read story 28 •Test on story 28 vocab
Day 4		•Read story 29 •Test on story 29 vocab	•Read story 30 •Test on story 30 vocab	•Read story 31 •Test on story 31 vocab	•Read story 32 •Test on story 32 vocab
Week 3					
Day 1		•Re-test on story 1 vocab	•Re-test on story 2 vocab	•Re-test on day 3 vocab	•Re-test on story 4 vocab
Day 2		•Re-test on story 5 vocab	•Re-test on story 6 vocab	•Re-test on story 7 vocab	•Re-test on story 8 vocab
Day 3		•Re-test on story 9 vocab	•Re-test on story 10 vocab	•Re-test on story 11 vocab	•Re-test on story 12 vocab
Day 4		•Re-test on story 13 vocab	•Re-test on story 14 vocab	•Re-test on story 15 vocab	•Re-test on story 16 vocab
Week 4					
Day 1		•Re-test on story 17 vocab	•Re-test on story 18 vocab	•Re-test on day 19 vocab	•Re-test on story 20 vocab
Day 2		•Re-test on story 21 vocab	•Re-test on story 22 vocab	•Re-test on story 23 vocab	•Re-test on story 24 vocab
Day 3		•Re-test on story 25 vocab	•Re-test on story 26 vocab	•Re-test on story 27 vocab	•Re-test on story 28 vocab
Day 4		•Re-test on story 29 vocab	•Re-test on story 30 vocab	•Re-test on story 31 vocab	•Re-test on story 32 vocab
Day 5	Post-Study: Take a post-participation survey				

In the First week

Day 1

You will be asked to take a pretest, to confirm whether you already know certain words.

You will be asked to answer a short survey regarding your first language and your background in studying Japanese language.

You will be reading four short stories containing some vocabulary you have not yet learned.

You will be asked to infer the meaning of the unknown words immediately following the reading.

Day 2-4

You will be reading four short stories containing some vocabulary you have not yet learned.

You will be asked to infer the meaning of the unknown words immediately following the reading.

In the Second week

As noted, you will switch reading types in week two. Everything else will be the same as the first week. The approximate time needed is the same as first week.

Day 1

You will be reading four short stories containing some vocabulary you have not yet learned.

You will be asked to infer the meaning of the unknown words immediately following the reading.

Day 2-4

You will be reading four short stories containing some vocabulary you have not yet learned.

You will be asked to infer the meaning of the unknown words immediately following the reading.

In the Third Week

In the third week, you will be asked to answer questions regarding the words that you were asked in the first week. It will take up to 10 minutes per day.

Day 1-4

You will be answering questions regarding the vocabulary you learned in Week 1.

In the Fourth Week

In the fourth week, you will be asked to answer questions regarding the words that you were asked about in the second week. It will take up to 10 minutes per day.

Day 1-4

You will be answering questions regarding the vocabulary you learned in Week 2.

A short anonymous questionnaire will be administered asking about your overall experience with this study. The questionnaire will take less than five minutes.

Your participation in this study may last up to 20 minutes per day.

4. Will I be paid?

There is no monetary compensation to participate in this study.

5. What are the risks?

There is risk that you may infer and memorize the incorrect meaning of some vocabulary words during the study. To correct this and confirm accurate learning, you will receive both types of readings and explanations after the study is complete. You may experience frustration after exposure to readings with too many unknown words. This is normal, but in case of discomfort, and if you wish to withdraw from the study, there will be no penalty for doing so. You can withdraw from this study at any time.

6. What are the benefits?

There are no benefits from participating in this study.

7. How will my information be protected?

The entire study will be conducted via Canvas and will be separate from the JAPN0200 course in Canvas. Canvas is password-protected with two-factor authentication required. I will be the sole person with access to the data. Your scores data will be stored in Canvas until the data is examined. After examination and analysis occurs, all identifiable data will be deleted.

For the purposes of presenting this study, code names/numbers for participants will be used on all research notes and documents. Your name or any linked score results will not be stored in any fashion.

For the purposes of this research study, your results and comments will not be connected to your class grade. Every effort will be made by the researcher to preserve your confidentiality.

Participant data will be kept confidential except in cases where the researcher is legally obligated to report specific incidents. These incidents include, but may not be limited to, incidents of abuse and suicide risk.

X University staff sometimes review studies like this one to make sure they are being done safely and correctly. If a review of this study takes place, your records may be examined. The reviewers will protect your confidentiality.

8. Are there any alternatives to this study?

Your participation is voluntary, and you may choose not to participate.

9. What if I want to stop?

You do not have to be in this study if you do not want to be. Even if you decide to be in this study, you can change your mind and stop at any time.

If you refuse to participate in or leave the study, your current or future relationship with X University, Atsuko Borgmann or academic standing, job status, reputation will not be affected.

Your participation in this study is voluntary. It is up to you to decide whether or not to take part in this study. If you decide to take part in this study, you will be asked to sign a consent form. After you sign the consent form, you are still free to withdraw at any time and without giving a reason. Withdrawing from this study will not affect the relationship you have, if any, with the researcher. If you withdraw from the study before data collection is completed, your data will be returned to you or destroyed.

10. Who can I talk to if I have questions about this study?

If you have any questions about your participation in this study, you can contact Atsuko Suga Borgmann.

11. Who can I talk to if I have questions about my rights as a participant?

If you have questions about your rights as a research participant, you can contact X University's Human Research Protection Program.

Consent to Participate

Your signature below shows that you have read and understood the information in this document, and that you agree to volunteer as a research participant for this study.

You will be offered a copy of this form.

Participant's Signature and Date

/

PRINTED NAME

APPENDIX B

Tables and Figures (Methodology)

Figure B1

A priori power analysis for research question 1

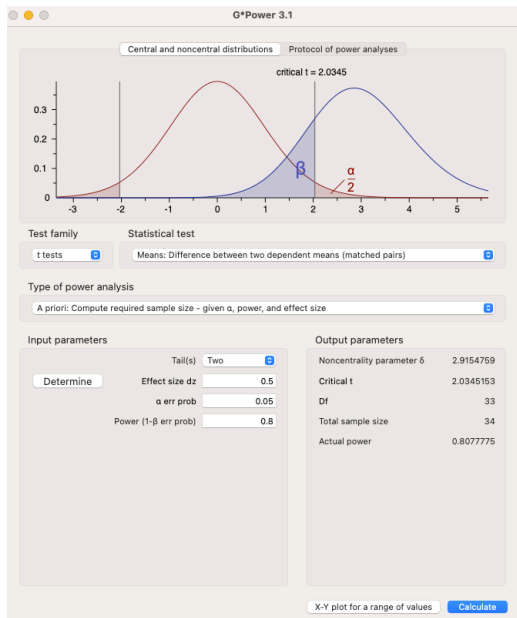


Figure B2

A priori power test analysis for research question 2

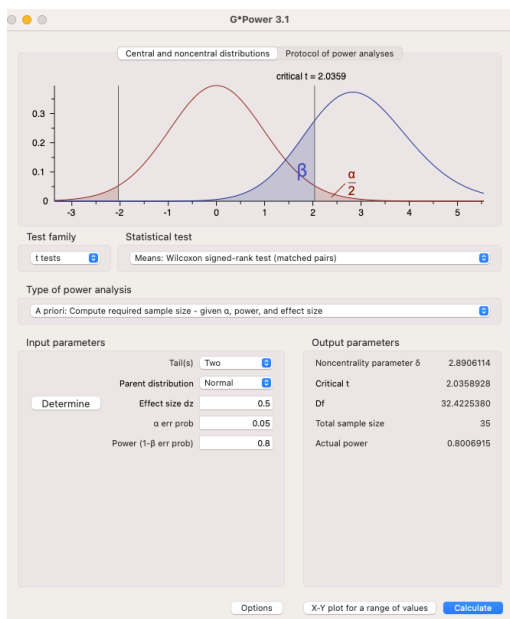


Figure B3

A priori power analysis for research question 3

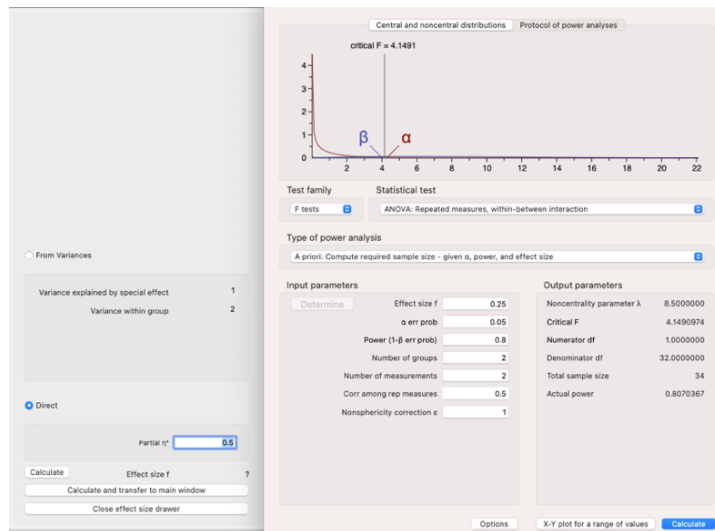


Table B1

Words that appeared in pretest 1 & pretest 2

Pretest 1

Number	Word in Japanese	English translation	Number	Word in Japanese	English translation
1	おくる Okuru	to send	24	つれていく * Tsureteiku	to bring with
2	やく * Yaku	to bake	25	のこる * Nokoru	to remain
3	ほれいざい * Horeizai	ice pack	26	うごく * Ugoku	to move
4	いためる Itameru	to fry	27	あつまる * Atsumaru	to gather
5	つく * Tuku	to turn on	28	ふつう Futsuu	normal
6	うける Ukeru	to receive	29	えらぶ Erabu	to choose
7	あける * Akeru	to open	30	とまる * Tomaru	to stop
8	こむ Komu	to get crowded	31	あく * Aku	something opens
9	どうろ Doro	road	32	まっくら * Makkura	pitch dark

10	おりる * Oriru	to get down	33	ならぶ * Narabu	to line up
11	よごれる * Yogoreru	to become dirty	34	よろこぶ Yorokobu	to be happy
12	いりぐち Iriguchi	entrance	35	きめる * Kimeru	to decide
13	われる * Wareru	to be broken	36	ひえる * Hieru	to be chilled
14	いきさき * Ikisaki	destination	37	よごす * Yogosu	to make dirty
15	おす * Osu	to push	38	おとす * Otosu	to drop something
16	おぼえる Oboeru	to remember	39	はじめる * Hajimeru	to start
17	たおす * Taosu	to knock down	40	たまる * Tamaru	to be piled up
18	かいだん Kaidan	stairs	41	まちがえる * Machigaeru	to make a mistake
19	あつまる * Atsumaru	to gather	42	かわかす * Kawakasu	to dry something
20	しめる * Shimeru	to close	43	ちがう * Chigau	to be wrong
21	おぼえる Oboeru	to remember	44	おろす * Orosu	to get something down
22	のせる * Noseru	to load up	45	ひやす * Hiyasu	to cool something
23	まがる Magaru	to turn			

*Words that appear in the study are marked with **

Pretest 2

Number	Word in Japanese	English translation	Number	Word in Japanese	English translation
1	かわる * Kawaru	something changes	24	まとめる * Matomeru	to put together
2	かんがえる * Kangaeru	to think about	25	へる * Heru	something decreases
3	さがる * Sagaru	to go lower	26	おわる * Owaru	something finishes
4	のこす * Nokosu	to leave behind	27	あらう Arau	to wash

5	かす Kasu	to lend	28	ふえる Fueru	to increase
6	にがて * Nigate	to be bad at	29	さます Samasu	to cool something
7	もうしこむ Moushikomu	to apply	30	おこす * Okosu	to wake someone up
8	あじさい * Ajisai	hydrangea	31	のこる * Nokoru	to remain
9	うける Ukeru	to receive	32	そうべつかい * Soubetsukai	farewell party
10	ふえる * Fueru	to increase	33	しゅうしょく * Shuushoku	to get a job
11	みつける * mitsukeru	to find	34	だす * Dasu	to pay money for
12	かりる kariru	to borrow	35	むす Musu	to steam
13	なおす * Naosu	to correct	36	かたづける * Katazukeru	to put something away
14	あげる * Ageru	to raise something up high	37	とれる * Toreru	to come out
15	おろす * orosu	to get something down	38	にる Niru	to boil
16	のせる * Noseru	to load up	39	たおれる * Taoreru	something falls down
17	はいる * Hairu	to enter	40	こまる Komaru	to be in trouble
18	えらぶ Erabu	to choose	41	つづける * Tsuzukeru	to continue something
19	うつす * Utsusu	to move something	42	わかす * Wakasu	to boil water
20	つつむ Tsutsumu	to wrap	43	だます Damasu	to deceive
21	わる * Waru	to crack something	44	つける * Tsukeru	to turn on the light
22	はずかしい * Hazukashii	to be embarrasse d	45	おちる * Ochiru	something/someone falls
23	よろこぶ Yorokobu	to be happy			

*Words that appear in the study are marked with **

Table B2

Words that appeared in the study

	Day 1	Day 2	Day 3	Day 4
Week 1	Question 1: Yaku (to bake) Wareru (to be broken) やく われる	Question 1: Osu (to push) Aku (<door> opens) おす あく	Question 1: Akeru (to open) Hajimeru (to start) あける はじめる	Question 1: Nokoru (to remain) Machigaeru (to make a mistake) のこる まちがえる
	Question 2: Oriru (to get down) Ugoku (to move) おりる うごく	Question 2: Makkura (pitch dark) Tsuku (<the light> turns on) まっくら つく	Question 2: Shimeru (to close) Yogosu (to make something dirty) しめる よごす	Question 2: Tamaru (to be piled up) Kawakasu (to dry something) たまる かわかす
	Question 3: Ikisaki (destination) Tomaru (to stop) いきさき とまる	Question 3: Narabu (<some things> are lined up) Kimeru (to decide) ならぶ きめる	Question 3: Atsumaru (to gather) Hieru (to be chilled) あつまる ひえる	Question 3: Taosu (to knock it down) Chigau (to be wrong) たおす ちがう
	Question 4: Noseru (to take someone on board) Tsureteiku (to take someone to somewhere) のせる つれていく	Question 4: Horeizai (ice pack) Hiyasu (to cool something) ほれいざい ひやす	Question 4: Otosu (to drop something) Yogoreru (to become dirty) おとす よごれる	Question 4: Okane wo orosu (to withdraw money) Nokoru (something remains) おかねをおろす のこる
Week 2	Question 1: Kawaru (something changes) Nokosu (to leave something) かわる のこす	Question 1: Heru (something decreases) Fueru (something increases) へる ふえる	Question 1: Wakasu (to boil water) Tsukeru (to turn on <the light>) わかす つける	Question 1: Toreru (to come out) Ochiru (someone/something falls) とれる おちる

	Question 2: Fueru (something increases) Mitsukeru (to find something) ふえる みつける	Question 2: Nokoru (something/someone remains in a location) Shushoku (getting a job) のこる しゅうしょく	Question 2: Waru (to crack something) Hairu (to enter) わる はいる	Question 2: Sagaru (to go lower) Dasu (to pay money for) さがる だす
	Question 3: Utsusu (to shift something; to move something to a different place) Hazukashii (to be embarrassed) うつす はづかしい	Question 3: Nigate (someone is not good at doing something) Ajisai (hydrangea) にがて アジサイ	Question 3: Okosu (to wake someone up) Tsudukeru (to continue something) おこす つづける	Question 3: Noseru (to load up) Owaru (something finishes) のせる おわる
	Question 4: Ageru (to raise something up high) Orosu (to get something down) あげる おろす	Question 4: Katazukeru (to put something away) Taoreru (something falls down) かたづける たおれる	Question 4: Naosu (to correct) Matomeru (to put together) なおす まとめる	Question 4: Sobetsukai (farewell party) Kangaeru (to think about) そうべつかい かんがえる

APPENDIX C

Survey Prior to Data Collection

1. Name: _____
2. Year: Freshman Sophomore Junior Senior
4. E-mail: _____
5. Major 1: _____
6. Major 2 (if any): _____
7. Have you studied Japanese before? Yes No
8. If yes, where, when, how long, and what was the textbook?
Institution:
When:
How long:
Textbook:
Chapters you studied:
9. What is your first language?
(_____)
10. What language(s) do you speak at home?
(_____)
11. What other languages do you speak or have studied? (list all)
(_____)
12. How long have you studied other languages and how fluent are you?
13. Have you visited or lived in Japan? Yes No

How long:
When:
Where:

14. Do you have any opportunity to use Japanese outside the classroom? (i.e. family, anime, manga, etc.) How many hours per week do you typically spend working with Japanese outside class (exclude your time spent on your Japanese assignments and quizzes)?

Speaking: No Yes: (give details) _____ hour(s)/week

Listening: No Yes: (give details) _____ hour(s)/week

Writing: No Yes: (give details) _____ hour(s)/week

Reading: No Yes: (give details) _____ hour(s)/week

15. What are your short-term goals in taking Japanese? What are your long-term goals?

16. What do you want to be able to do by the end of the semester in this course? (list as many as you like)

I can:

I can:

I can:

...

17. Is there anything you would like us to know about yourself?

Thank you very much!

APPENDIX D

Grading Criteria

Table D1

Week 1 Day 1 Question 1 & 2 Acceptable and Unacceptable Answers

Word in Question	Correct Answer	Variation	Variation	Variation
<i>Yaku</i>	to bake, to fire	to burn, cookrf (sic) <i>spelling error for cooked</i>	baked	roasted
<i>wareru</i>	to have been broken	to break	is broken	

Unacceptable Answers

yaku: to craft or make something, spill, jealous, to remove, gift (mislead by the drawing), to show, to appreciate, bring, tired, I brought, scared, enjoy, bad

wareru: forgotten, I just remembered, weak, I know, to have been forgotten, to understand, not a problem, guess, mean

Table D2

Week 1 Day 1 Question 3 & 4 Acceptable and Unacceptable Answers

Word in Question	Correct Answer	Variation	Variation	Variation
<i>oriru</i>	to get down, asking the dog to get down	come down	to get off	to get off something
<i>ugokanai</i>	won't move, not moving	won't move,	cannot move	to not move or stay still

Unacceptable Answers

oriru: To lay, nap (mislead by the picture), to lie, to get up, to leave, get in (to bed), allergic, get on top, to stay, leave, to climb on/to get on, to lay down, lie, to get in bed, to stay off

ugokanai: don't listen, sneeze, not spacious (mislead by the picture), can't get comfortable, to lie down, get in, don't care, will not leave, doesn't know, to obey, to disobey, have bad behavior, won't wake up, to leave behind, space, have no room, didn't work

Table D3

Week 1 Day 1 Question 5 & 6 Acceptable and Unacceptable Answers

Word in Question	Correct Answer	Variation	Variation	Variation
<i>ikisaki</i>	destination	location button?	some sort of place that has a button	N/A
<i>tomatteta</i>	has been stopped	stopped	broken	not working
		off/run slow	it stopped	stopped moving

Unacceptable Answers

ikisaki: glowing, ticket, ticket machine, one way, assistance, random, departure, important, time table, ticket stop, blazer, train ticket machine, just now, uniform, infrequent, some, crosswalk, passway, train station, elevator, station platform, place, plan, waiting, just now, this one, to press

tomatteta: to stay, to be late, was wrong, was off, to be slow, broke, to arrive, was running behind, wrong, arrived, wait, stay over, to break, to wait, to check

Table D4

Week 1 Day 1 Question 7 & 8 Acceptable and Unacceptable Answers

Word in Question	Correct Answer	Variation	Variation	Variation
<i>noseru</i>	to take on board to give a ride	ride with to let on a ride	to bring (for a ride) to put into	to ride in put

<i>tsurete ikou</i>	to take someone to somewhere	bring with	to plan to go	to bring along

Unacceptable Answers

nosete: get down, to ride, bark, sit inside, get in, bring, to drive, travel with, put into, riding, come back, get in, jump

tsurete ikou: get together, lazy, leave, go with, get in, bring, to drive, travel with, put into, to take a walk with, to walk, tired of, to stay the same, to enjoy, to explore an area, meet again, to pet, go get, to do it again

Table D5

Week 1 Day 2 Question 1 & 2 Acceptable and Unacceptable Answers

Word in Question	Correct Answer	Variation	Variation	Variation
<i>osu</i>	to push	pushed	press	
<i>aku</i>	(door) opens	to open	opened	

Unacceptable Answers

osu: the correct (place), haunted, to deliver, open a door, Pushed, do this, weak, to leave something, to be supposed to, pass on, to be home, heat, ring, to ring, delivery, to make noise, to touch, to be like, to ring a door, it looks run down, to come out, supposed to be, empty, forcibly, taking, proceed, kick?, to knock

aku: close a door, hot, broke, have, to do, to be scary, closed, was possessed, locked, evil, want to lock, push, open or closed

Table D6***Week 1 Day 2 Question 3 & 4 Acceptable and Unacceptable Answers***

Word in Question	Correct Answer	Variation	Variation	Variation
<i>makkura</i>	pitch dark	dark	pitch black	dark inside
<i>(denki ga) tsuku</i>	(the light) turns on	is on turned on	turned on the lights are on	light up To switch on

Unacceptable Answers

makkura: empty, completely empty, light, no one, get back, concerned, silent, shadowy, someone's there, spookey (sic), fine, empty, to be home, ask, important, empty, to deliver, sounds, sound, to wait, to be home, empty, ask, sound, creepy, listed, empty, no one, noise, surprising, bleak future, to be open, strange, to bring inside, doesn't mean to intrude, sound, kind of empty (sic)

(denki ga) tsuku: off/down, turned off, turn off, to change, make, to be worried, startled, to open, to arrive, to appear, shoes, stopped, to arrive, illuminated, bright, to appear, to emit, open, to move, to arrive, heard, flashed, to move, to ring, out, to hit, was sparked, were turned off, lights are off or maybe bright, turned off, to make, appeared, outage/broken, cool

Table D7***Week 1 Day 2 Question 5 & 6 Acceptable and Unacceptable Answers***

Word in Question	Correct Answer	Variation	Variation	Variation
<i>narabu</i>	(some things) are lined up	to be displayed, neatly arranged (cakes)	display, they are displayed	lined up, aligned
<i>kimeru</i>	cannot decide	can't decide	to not know which one to pick	to decide

Unacceptable Answers

narabu: to come for something, to think, decoration, presentation, sparkling, something like shown, to cry, any of, to frost, frosting, decorated, looks, to appear, to drool, am choosing between, bake, to choose, desirable, to bake, to choose, fluffy, to have options, mouthwatering, to want, to appear, making me hungry, to look delicious, made, taste good,

kimeru: to taste, do not sell, flawless, not see, think, buy, to not be able to, can enjoy it, not be able to choose, cannot buy everything, potentially bad, to choose, be decorated, fresh, unappetizing, to be hungry, to have a lot, to be pretty, or should I get, put up, undeniable, not nice

Table D8

Week 1 Day 2 Question 7 & 8 Acceptable and Unacceptable Answers

Word in Question	Correct Answer	Variation	Variation	Variation
<i>horeizai</i>	ice pack			
<i>hiyasu</i>	to cool (something)	to be kept cold	to refrigerate	to be chilled

Unacceptable Answers

horeizai: To freeze, ice, application, signature, while you wait, sale, product, alarm clock

hiyasu: to melt, to put, quickly (do something), come visit, fancy, be careful, carefully, carry, wait, to hurry, medicine, vehicle, each everything, bag, melted, to put in, to pack, to spoil, be careful, to clean, to request, recommend, check on it, to melt, to put in, to make sure, is melting

Table D9***Week 1 Day 3 Question 1 & 2 Acceptable and Unacceptable Answers***

Word in Question	Correct Answer	Variation	Variation	Variation
<i>akeru</i>	let's open, to open	open	should open	let's open the window
<i>hajimeru</i>	to start	begin (flower) are starting to bloom	started	to begin (something)

Unacceptable Answers

akeru: to go for a walk, to look out of, to end/be over, fly

hajimeru: to introduce, bloom, pretty

Table D10***Week 1 Day 3 Question 3 & 4 Acceptable and Unacceptable Answers***

Word in Question	Correct Answer	Variation	Variation	Variation
<i>shimeru</i>	to close	close (the window)	to get close	to shut
<i>yogosu</i>	to make things dirty	became messy	dirty	make a mess

Unacceptable Answers

shimeru: to be unfortunate, broke, to consider, to slide, to open, completely, play, to continue, to have, to move, late, clean, to die, come to an end

yogosu: take off, clean, is private, to clean, to tear, to destroy, to tear apart, happen, to discover, to ruin, to get away from, allow, notice, empty, to be located, to be in, to break, to be located, to be in

Table D11***Week 1 Day 3 Question 5 & 6 Acceptable and Unacceptable Answers***

Word in Question	Correct Answer	Variation	Variation	Variation
<i>atsumaru</i>	to gather	to hang out	get together	reunite
<i>hieru</i>	to be chilled	become cold	to cool down	

Unacceptable Answers

atsumaru: going, to arrive, remember, lively, to hold an activity, to be at, exciting, to head to, drinking, attend, to be crowded, think about, improve, celebratory, news, to throw, not allowed, throw/plan, have a party, to attend, let's, plan, celebrate, to host, organize, miss, miss, to throw, to stop, to stop waiting, resume, together, to present, is over and, cease, special surprising, to throw or arrange, to feel hot

hieru (hieteiru): to share, to spill, to be the best, to offer, fresh, to share, refreshing, sweet, fresh, to be enjoying, trying, like, to bring, tasty, to get wet, handmade, refreshing, to share, overflowing, to chug, cheers, taste, to share, to empty, spoiled, full of alcohol, to be trying, to be free, to enjoy, gulping, to help yourself, excellent, try on, spilled, sour, flowing, to squeeze

Table D12***Week 1 Day 3 Question 7 & 8 Acceptable and Unacceptable Answers***

Word in Question	Correct Answer	Variation	Variation	Variation
<i>otosu</i>	to drop something	to drop	drop	
<i>yogoreru</i>	to become dirty	dirty	messy	filthy

Unacceptable Answers

otosu: lost, lost his wallet, forgot, to be cautious, to show, to try on, intrude, cannot, to purchase, can I help you, lose, 0, to disappear, to order, help, to make a return, to leave

yogoreru: return, to give back, to hand over, to return, to give back, to listen, to call someone, yogurt, lost something, beaten up, you want to buy, found, to wonder, already

Table D13

Week 1 Day 4 Question 1 & 2 Acceptable and Unacceptable Answers

Word in Question	Correct Answer	Variation	Variation	Variation
<i>nokoru</i>	to remain	Remain, is remaining	to be left	to leave behind
<i>machigaeru</i>	to make a mistake	give the wrong item, make an error	my mistake, to mix up	mistakenly put, confused/mixed up

Unacceptable Answers

nokoru: to be salty, loud, to wonder, to not know, drink, to sip, to be full, to sip, pouring, put, salty, decrease, salty, to lie, salty, can drink, undrinkable, concerning, to be salty, to order, to ask to drink, unsweet, bitter, smell, bitter, to get mad, drink, finished, to be familiar, bitter, finish, to fetch, to spoil, to be left, to enjoy, to taste, to finish, is gone, to taste, to leave alone, to disappear, to brew, to stop, drink, enjoying, to have, to brew

machigaeru: spill, by accident, to add, city have (sic), to pour salt, don't drink, to put in, by accident, I confused, to add, had salt, to add salt, to ask for, to much of (sic), to fix or help, to ruin, there was too much, too much, to be out of, switched, to return to town, to take, empty road, threw out

Table D14***Week 1 Day 4 Question 3 & 4 Acceptable and Unacceptable Answers***

Word in Question	Correct Answer	Variation	Variation	Variation
<i>tamaru</i>	to accumulate; to be piled up	piled up		
<i>kawakasu</i>	to dry (something)	dry	to become dry	hang (out to dry)

Unacceptable Answers

tamaru: gather, to use, to wash, collect, stop, to be dirty, to be disorganized, spread out, have a lot of, to stink, smells, to lie around, need, stink, to be messy, to be dirty, to need, to dry, to be washed, to warm (towels), found, to have unclear items, to fold laundry, to collect, placed in, avoid, stayed in, to gather, messy, has not left, cleaned up, unfinished, take, to complete, to have done, to clean, to do errands, bring inside, to have a lot, to stay, need to be done, to collect, built up, to stay,

kawakasu: to get an idea, smell, wash, to leave out, to scare, to pile up, to be useful, to embarrass, to hang, to clean, to combine, to show, easy to get, relieved, borrow, to clean, clean, process, to throw out, important, important, to go outside, leave, to do later, delivered,

Table D15***Week 1 Day 4 Question 5 & 6 Acceptable and Unacceptable Answers***

Word in Question	Correct Answer	Variation	Variation	Variation
<i>taosu</i>	to knock it down	defeat	to fall down	beat
<i>chigau</i>	to be wrong	no that's not it	wrong/bad that's wrong	to be unacceptable no, wrong

Unacceptable Answers

taosu: to appear, stab, rough, to kill, fight, to play a game, to click, winning, to scare, horrible, to attach, weak, have fun, attach, to attach, fighting, to punch, to attack, moves quickly, to play (game), to kill, to punch or fight, to kill, teach me, themed, stayed in, to play, to fight, to attack, consider, to enjoy, to suggest, to have fun, to include, how about, to know, how about, to kill, yummy, win, throwing, to fall

chigau: over, to end, end, want to, oh no, play again, to lose, not at all, borrow, watch out, not yet, I know!, catch/caught

Table D16

Week 1 Day 4 Question 7 & 8 Acceptable and Unacceptable Answers

Word in Question	Correct Answer	Variation	Variation	Variation
okane wo orosu	to withdraw money	take out money	to withdraw	to get money from an ATM
nokoru	to be left	remaining to have (in stock)	no more left remain	left over no more

Unacceptable Answers

okane wo orosu: to receive money, drop money, afford, to lower the money, don't have much money, low on money, spend money, have no money, no money to use, not have money, save money, to lend, money...and to lose money?, lend money, to be out of money, to borrow money

nokoru: available, to be sold out, want to, to run out of, choose, have, to disappear, decide, to have, to find, to lose, to take, concerning, to disappear, to get from someone, to lose someone, to taste, to get, to have, can I have, to pick, nothing but, to have? (sic), to be out of, to get by/to buy

Week 2

Table D17

Week 2 Day 1 Question 1 & 2 Acceptable and Unacceptable Answers

Word in Question	Correct Answer	Variation	Variation	Variation
<i>kawaru</i>	to change, change	changed	changing	
<i>nokosu</i>	to not leave something	do not leave	don't waste	to leave (on the plate)

Unacceptable Answers

kawaru: to fall, falling, to fall, to blow (as in wind), leaves falling, vary, to remain, to be cool, bloom, falling, drift/float, to adapt, nothing, bad, dim, be cold, to close, be cute, to stay the same

nokosu: do not be shy, to stare, to lie, enjoy, help yourself, seasonal, to not have to wait, don't be afraid, do not wait, to be calm, restraint, to pick out, begin, to be uncomfortable, hesitantly, it's OK, do not complain, to finish, hold back, do, don't be picky, feel free (to eat), to inspect, don't try, to enjoy, do your best, nothing, is not unhealthy, non living, to not delay

Table D18

Week 2 Day 1 Question 3 & 4 Acceptable and Unacceptable Answers

Word in Question	Correct Answer	Variation	Variation	Variation
<i>fueru</i>	(something) increases, increase	accumulating	growing	increasing in number
<i>mitsukeru</i>	to find something, find something	found	to pick out	to find/to look

Unacceptable Answers

fueru: stand in line, crowded, come, to queue (British English), line up, to wait in line, excited, to arrive, heading (to), eat a lot or popular, multiplying, coming/going, inside, to bustle, to gather, get crowded, to celebrate, traditional, a food, to observe (the holiday), to grow, to gather, to be there, to extend people, to beat fast

mitsukeru: to give, to get, get, got the present, get, shop, to present, to choose, to enjoy, get, to give, to show to surprise, to bring, to give buy/bring, to attend, to get, to get/buy something (for someone else), prepared, to gift, receive, to gift something to someone, got, to wrap, to get, to hide, to prepare, to gift, gave, chose, to surprise

Table D19

Week 2 Day 1 Question 5 & 6 Acceptable and Unacceptable Answers

Word in Question	Correct Answer	Variation	Variation	Variation
utsusu	to shift something, to move something to a different place	switch move	to replace the pictures into a new box from the old box	to move, transfer
hazukashii	embarrassing, to be embarrassed	embarrassing	to be flattered	shy, ashamed

Unacceptable Answers

utsusu: to put in, sorting, to replace, package, transfer, to be inside, to throw away, wrap, to put in, to put back, to donate, to put away, to be inside, to grab, to empty out, put (pictures) in, take out, to look through, to search, to dust, to be older, to take, to paint, to show a picture

hazukashii: wonderful, thoughtful, nostalgic, kind, complimentary, young, long time ago, surprising, generous, sweet, to read to someone, surprising, startled, unusual, to be amazing, long time ago, difficult, that's me, unsure, appreciate, let me see, sad

Table D20

Week 2 Day 1 Question 7 & 8 Acceptable and Unacceptable Answers

Word in Question	Correct Answer	Variation	Variation	Variation
ageru	to raise something up high	to fly up to go up	lift to rise	the wind lifts up the kite
orosu	to get something down	bring down	to bring it down	to get down

Unacceptable Answers

ageru: fly, float, to give, to give, to fly, to point, to give (gifts), flying, give, to fly, release, to be eliminated, blowing, give up, hold, to unfurl, to open, to increase, to give, blow, to fall, to send, for wind to blow hard

orosu: hold it, correct, harder than it looks, fly, to let go, retrieve, to control, to hold on, strong, to keep, to stop, make higher, is this done/performed, drift, nervous, pull it in, to get good at, invitation, to be safe, to be unlucky, to elevate, fly, to hold on, to fly, dangerous, to fly, to be worried, wild, to drop, to try

Table D21

Week 2 Day 2 Question 1 & 2 Acceptable and Unacceptable Answers

Word in Question	Correct Answer	Variation	Variation	Variation
<i>heru</i>	something decreases	slowly starts to be gone going away	vanish	to decrease
<i>fueru</i>	something increases	gained weight increased	to gain (weight) to weight more (sic)	accumulate to become heavier

Unacceptable Answers

heru: eat another, take, crave, melting, love, to share, to take, that's okay, stop, to let help, to be in trouble, to enjoy, to continue, to need, eat, enjoy, amazing, get, to sound good, more, to wolf down (food), to roll, be stuffed, disappear, delicious, to give, continue, to get more, to enjoy, more, to be addicting

fueru: to become sad, fat, problem, to weigh, to be sad, to return, disappointing, fine, surprised, to be careful, have, to be wary of, to hope

Table D22

Week 2 Day 2 Question 3 & 4 Acceptable and Unacceptable Answers

Word in Question	Correct Answer	Variation	Variation	Variation
<i>nokoru</i>	something/someone remains in the location	to remain in	to remain	stay
<i>shushoku</i>	getting employment	employment to be employed	to get a job	to find a job

Unacceptable Answers

nokoru: work hard, rise, return, to work, formal, arrive, migrate, to work hard, to move to, known, to increase, to glare, originating/based in, progressing, promotion, to lead, to enjoy, business, to be employed, living in, to have, employed, to move, to stay, to leave, in, to live, to find a job

shushoku: business, own, the next day, accountant, grow, salaryman, stocks, become, to be promoted, business administration, migrate, to work hard, to move to, finance, economist, stocks, work, investor, to visit, president of a company, responsibilities, CEO, company president, job, assistant, intern, businessman, career, business work, internship, job, other things, real estate, Placement

Table D23

Week 2 Day 2 Question 5 & 6 Acceptable and Unacceptable Answers

Word in Question	Correct Answer	Variation	Variation	Variation
<i>nigate</i>	not good at something	terrible at	to be bad at	bad
<i>ajisai</i>	hydrangea			

Unacceptable Answers

nigate: uninterested, not athletic, to begin, Cant (sic), lazy, begin soon, can't, exercise, to attend, to lack, not a lot, stopped, do not do, to not do, to run, play, do not, not often, to be familiar, Don't do at all, to offer, run, interrupted, avoid, March, activity, martial arts, exercise

ajisai: sight seeing, flower arrangement, flower, allergy, fragrance, a type of flower, some type of flower, to age, poetry, rose, petal, azalea, bloom, agitate

Table D24***Week 2 Day 2 Question 7 & 8 Acceptable and Unacceptable Answers***

Word in Question	Correct Answer	Variation	Variation	Variation
<i>katazukeru</i>	to put something away	to store something	to clean up	put away
		to put in a box	to pack away	to place
<i>taoreru</i>	(something) falls down	fall over	falling	

Unacceptable Answers

katazukeru: package, bought, to participate, to misplace, to find, gave, to lose, to break, occupying, in a few months, to try, found, to hang up, to get rid of, be there, to wait and see, to finish

taoreru: carefull (sic), careful, let me do it, look out, wait, that's okay, stop, to let help, to be in trouble, to be dangerous, to be careful, stop, to lose balance, stop, let it be, to stop, wait, to slow down, sto(sic), to ask, to hurt oneself, to leave alone, cautious, to be careful, climb up, to be careful, to look somewhere, support, to climb, careful, to make, to leave, to trip, As well

Table D25***Week 2 Day 3 Question 1 & 2 Acceptable and Unacceptable Answers***

Word in Question	Correct Answer	Variation	Variation	Variation
<i>wakasu</i>	to boil water, boil water	boil	boiling	to heat up
<i>tsukeru</i>	to turn on (the light)	turn on	on	to switch on

Unacceptable Answers

wakasu: to be ready, to warm, heat, to birth, to add, make, to wait, rest, do, to cheer up, see what there is, search, to settle for, to do early, to forget

tsukeru: to make, warm, to leave, to use, to be off, to turn off, to warm up, to take, bad weather, electricity, to attach, down, to feel, to change, to worsen, to check, to put on

Table D26

Week 2 Day 3 Question 3 & 4 Acceptable and Unacceptable Answers

Word in Question	Correct Answer	Variation	Variation	Variation
waru	to crack (something); to break something thin	to break open to split	to break divide	to crack open
hairu	to be inside; to enter	to enter to put in	to enter/go in entering	to be put into to store (something)

Unacceptable Answers

waru: bad, to leave, over, boiled, to cover, to be hot, to drop, to be raw, to receive, put on top, taste bad, boil, to start with, stink, mixer, taste, to be dry, add, to tolerate, to cook, heat, unfamiliar, to beat, to add, to mix, to place on top

hairu: to enjoy, to freeze, refrigerated, cooked, to put, to mix, to have in stock, to work, to leave in, to tolerate, to cook, heat, unfamiliar, to put, do not open it

Table D27***Week 2 Day 3 Question 5 & 6 Acceptable and Unacceptable Answers***

Word in Question	Correct Answer	Variation	Variation	Variation
<i>okosu</i>	to wake someone up	wake up	to be awake	
<i>tsuzukeru</i>	to continue (something);	to last to be consistent	let's continue (something) last for	to do daily

Unacceptable Answers

okosu: to be ready, to ring, to get ready, told, to have an agreement, answer (the phone), to be late, to be patient, sleeping in, to be lazy, to imagine, to startle, to stretch, came late, to daydream/space, to sweat, to move, to greet, good morning to you

tsuzukeru: to take, disappear, all week long, all week, more, to go out, to try, regularly (not a verb), meet, add on, to happen in, to be ideal, availability, to exercise, to meet again, gave up, to work out, to arrive, to plan, to take time, let's meet up, to begin

Table D28***Week 2 Day 3 Question 7 & 8 Acceptable and Unacceptable Answers***

Word in Question	Correct Answer	Variation	Variation	Variation
<i>naosu</i>	corrected, to correct	fix	to correct	fixed
<i>matomeru</i>	to put together			

Unacceptable Answers

naosu: to make mistake, fall, missing, incorrect, to address, to turn in, ached, got high grade (all wrong), to be wrong, to get something wrong, to try again, to do bad, to get wrong, to make a

mistake, didn't hand in, unwell, left, to misspell, incorrect, failed, to worked on, to comprehend, stuck, to repeat, arrive late, he was recovering, repeated occurrence, to fire, to get wrong, to forget, arrive late

matomeru: to struggle, to forget, to put aside, to work ahead, forgot, to be early, hand in, to complete, to put off, ahead of time, to work on in advance, have to do, to burn, incorrect, failed, finish, to get done, forgot to do something, to correct, to finish, to complete, do something in advance, to do early, to forget, to slack off on, to be hurried, next, to catch up, to not complete, to grab, organize

Table D29

Week 2 Day 4 Question 1 & 2 Acceptable and Unacceptable Answers

Word in Question	Correct Answer	Variation	Variation	Variation
toreru	to come out; come out	fell out	to drop	to drop or fall
		to fall off	to drop on the ground	to take off
ochiru	to fall; fall	to fall in love	fell in love	fell

Unacceptable Answers

toreru: look nice, to pick a flower, to be romantic, to offer help, taken, to give, is unbalanced, wilted, they took, to try on, to be difficult, to throw, to take, to fall down, to smell nice

ochiru: to become, weak, heart attack, love, to feel love, to be pleased, to attend, in love, to develop, praised, to be excited, to admire, to experience, to feel, to crush on, felt, to be unsure, to experience, ready, to cry

Table D30***Week 2 Day 4 Question 3 & 4 Acceptable and Unacceptable Answers***

Word in Question	Correct Answer	Variation	Variation	Variation
sagaru	to go lower; go lower	discount decrease	(for something) to lower went down	to lower to reduce
dasu	to pay money for; pay money for	I'll pay, to cover the bill	to treat someone	to pay

Unacceptable Answers

sagaru: be on sale, ranging, to cost, to bring, between, total, to be on sale, cost, to say good things, collectively, offering, to have on the menu, to order, to earn

dasu: to bring, to take out, to insist, bill, to send out, to agree, hasty, to insist, tasty, to be full, start, to be broke, to not have money, to serve, to order, have, to submit, to be undecided, shift, got it

Table D31***Week 2 Day 4 Question 5 & 6 Acceptable and Unacceptable Answers***

Word in Question	Correct Answer	Variation	Variation	Variation
noseru	load up; to load up	to put something, to put on	to load it in	load
owaru	to finish; finished	done finished, ended	finish	(for something) to end

Unacceptable Answers

noseru: to move, to drive, to take abroad, too many things, to carry, to fit, pack, move, confident, to be ready, to rent, put on, complete, to stay/remain, heavy, to transport, to drive,

owaru: to help, to start, to be excited, to help, we did it, to be successful, to figure out, to rent, put on, to arrive, to find, loaded, to drop

Table D32

Week 2 Day 4 Question 7 & 8 Acceptable and Unacceptable Answers

Word in Question	Correct Answer	Variation	Variation	Variation
<i>sobetsukai</i>	farewell party	going away party	goodbye party	
<i>kangaeru</i>	to think about; think about; even though I think	think back can't think	to remember/to think about	even when thinking

Unacceptable Answers

sobetsukai: going away, farewell, to miss someone, plans, farewell, sadly, departure, going away, last day, final, farewell, last, to wait, funeral, good bye, Final Day, leaving, say good bye, to leave

kangaeru: to experience, kindness, to remember, will never forget, to miss, memories, remember, to decide, to choose, to meet, to return home, to choose, choosing, to enjoy, memories or experiences, to leave, memorable, lots to say, to choose, other things

APPENDIX E

Reading Texts for Week 1 and Week 2

Reading assignment with Manga for Week 1 Day 1 Question 1

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of やく ? [answer1]
to bake, to fire
2. What is the meaning of われてる (dictionary form: われる) ? [answer2]
to be broken

Reading assignment with Manga for Week 1 Day 1 Question 2

Please read the following manga and answer the questions.



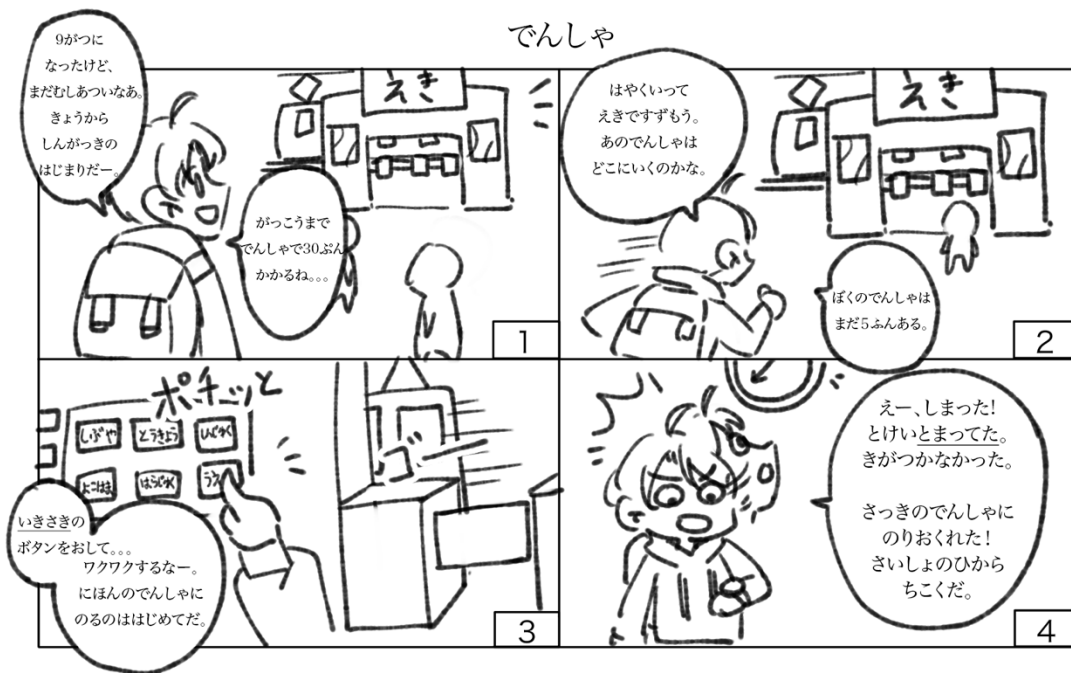
Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of おりて (おりる) ? [answer1]
to get down (from the bed)
asking the dog to get down from the bed
2. What is the meaning of うごかない (dictionary form: うごく) ? [answer2]
not moving; doesn't move

Reading assignment with Manga for Week 1 Day 1 Question 3

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of いきさき? [answer1]
destination
2. What is the meaning of とまってた? [answer2]
has been stopped

Reading assignment with Manga for Week 1 Day 1 Question 4

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of のせて ? [answer1]
to take (someone) on board, to give a ride
2. What is the meaning of つれていこう ? [answer2]
to take someone to somewhere

Reading assignment with Manga for Week 1 Day 2 Question 1

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of おして ? [answer1]
to push
2. What is the meaning of あいた ? [answer2]
(the door) opens

Reading assignment with Manga for Week 1 Day 2 Question 2

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of まっくら？ [answer1]
pitch dark
2. What is the meaning of ついた？ [answer2]
(the light) turns on

Reading assignment with Manga for Week 1 Day 2 Question 3

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of ならんでる? [answer1]
(some things) are lined up
2. What is the meaning of きめられない? [answer2]
cannot decide

Reading assignment with Manga for Week 1 Day 2 Question 4

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of ほれいざい? [answer1]
ice pack
2. What is the meaning of ひやして? [answer2]
to cool (something)

Reading assignment with Manga for Week 1 Day 3 Question 1

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of あけよう ? [answer1]
let's open, to open
2. What is the meaning of はじめた ? [answer2]
to start

Reading assignment with Manga for Week 1 Day 3 Question 2

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of しめて? [answer1]
to close
2. What is the meaning of よごして? [answer2]
to make things dirty

Reading assignment with Manga for Week 1 Day 3 Question 3

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of あつまつて ? [answer1]
to gather
2. What is the meaning of ひえている ? [answer2]
to be chilled

Reading assignment with Manga for Week 1 Day 3 Question 4

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of おとして ? [answer1]
to drop
2. What is the meaning of よごれて ? [answer2]
to become dirty

Reading assignment with Manga for Week 1 Day 4 Question 1

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of のこってる (のこる) ? [answer1]
to remain
2. What is the meaning of まちがえました (まちがえる) [answer2]
made a mistake

Reading assignment with Manga for Week 1 Day 4 Question 2

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of たまってた (たまる) ? [answer1]
to be accumulated
2. What is the meaning of かわかす (かわかす) ? [answer2]
to dry (something)

Reading assignment with Manga for Week 1 Day 4 Question 3

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

Question 3

1. What is the meaning of たおして (たおす) ? [answer1]
to knock it down
2. What is the meaning of ちがう (ちがう) ? [answer2]
to be wrong

Reading assignment with Manga for Week 1 Day 4 Question 4

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of おかねをおろす？ [answer1]
to withdraw money
2. What is the meaning of のこって (のこる)？ [answer2]
to be left

Reading assignment with Manga for Week 2 Day 1 Question 1

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of かわって (かわる) ? [answer1]
to change
2. What is the meaning of のこさないで (のこす) ? [answer2]
to leave something

Reading assignment with Manga for Week 2 Day 1 Question 2

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of ふえてる (ふえる) ? [answer1]
(something) increases
2. What is the meaning of みつけた (みつける) ? [answer2]
to find something

Reading assignment with Manga for Week 2 Day 1 Question 3

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of うつして (うつす) ? [answer1]
to shift something; to move something to a different place
2. What is the meaning of はずかしい (はずかしい) ? [answer2]
to be embarrassed

Reading assignment with Manga for Week 2 Day 1 Question 4

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of あげる (あげる) ? [answer1]
to raise something up high
2. What is the meaning of おろす (おろす) ? [answer2]
to get something down

Reading assignment with Manga for Week 2 Day 2 Question 1

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of へる (へる) ? [answer1]
something decreases
2. What is the meaning of ふえた (ふえる) ? [answer2]
something increases

Reading assignment with Manga for Week 2 Day 2 Question 2

Please read the following manga and answer the questions.



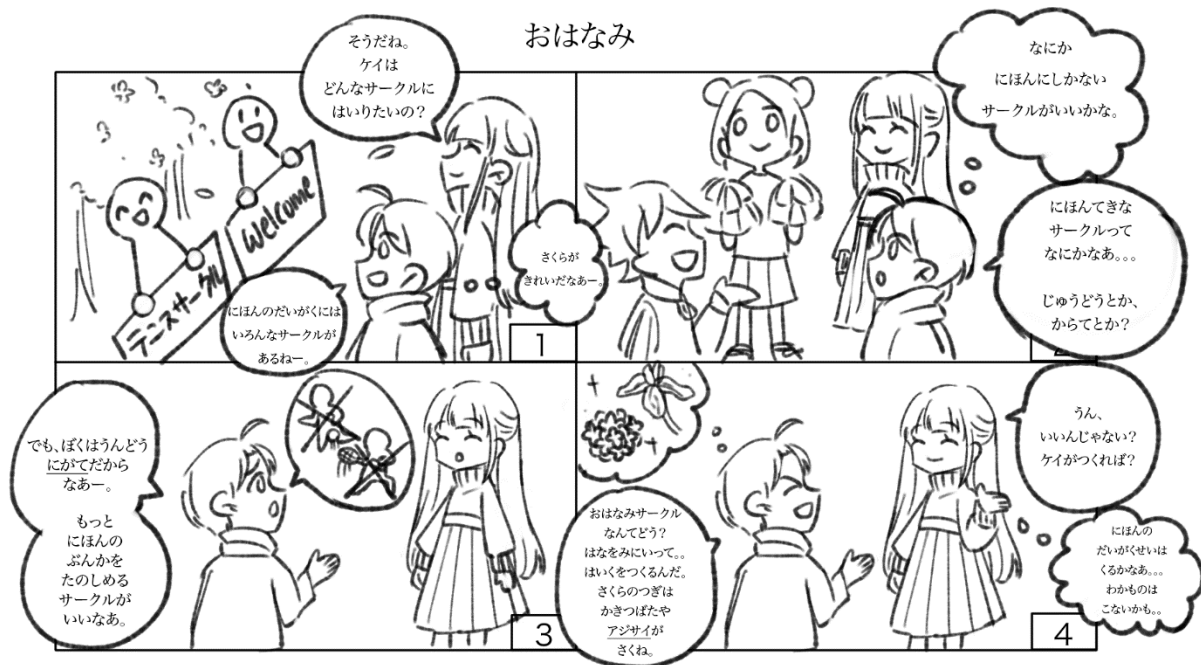
Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of のこつて (のこる) ? [answer1]
something/someone remains in the location
2. What is the meaning of しゅうしょく ? [answer2]
to take someone to somewhere

Reading assignment with Manga for Week 2 Day 2 Question 3

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of にかて? [answer1]
someone is not good at doing something
2. What is the meaning of アジサイ? [answer2]
hydrangea

Reading assignment with Manga for Week 2 Day 2 Question 4

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of かたづけた (かたづける) ? [answer1]
to put something away
2. What is the meaning of たおれます (たおれる) ? [answer2]
(something) falls down

Reading assignment with Manga for Week 2 Day 3 Question 1

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of わかして (わかす) ? [answer1]
to boil water
2. What is the meaning of つけて (つける) ? [answer2]
to turn on (the light)

Reading assignment with Manga for Week 2 Day 3 Question 2

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of わって (わる) ? [answer1]
to crack (something)
2. What is the meaning of はいって (はいる) ? [answer2]
to be inside, to enter

Reading assignment with Manga for Week 2 Day 3 Question 3

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of おこして (おこす) ? [answer1]
to wake someone up
2. What is the meaning of つづけよう (つづける) ? [answer2]
to continue (something), Let's continue (something)

Reading assignment with Manga for Week 2 Day 3 Question 4

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of なおした (なおす) ? [answer1]
corrected (or to correct)
2. What is the meaning of まとめて (まとめる) ? [answer2]
to put together

Reading assignment with Manga for Week 2 Day 4 Question 1

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of とれました (とれます) ? [answer1]
to come out
2. What is the meaning of おちた (おちる) ? [answer2]
to fall

Reading assignment with Manga for Week 2 Day 4 Question 2

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of さがっています (さがる) ? [answer1]
to go lower
2. What is the meaning of だす ? [answer2]
to pay money for

Reading assignment with Manga for Week 2 Day 4 Question 3

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of のせる (のせる) ? [answer1]
to load up
2. What is the meaning of おわった (おわる) ? [answer2]
finished

Reading assignment with Manga for Week 2 Day 4 Question 4

Please read the following manga and answer the questions.



Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement.

If you cannot guess the meaning, please type 0.

1. What is the meaning of そうべつかい? [answer1]
farewell party
2. What is the meaning of かんがえても (かんがえる)? [answer2]
to think about

Reading Assignment with English glossary for Week 1 Day 1 Question 1

Please read the following text and answer the questions.

<Host Family 1>

At the airport

ケイ：はじめまして。ケイです。よろしくおねがいします。

ホストファミリー：こちらこそ、よろしくおねがいします。

ケイ：あれがゆうめいなとうきょうスカイツリーですね。

ホストファミリー：そうそう。スカイツリーはせかいでいちばんたかいでんぱとうだよ
よるのライトアップもきれいだよ。

(glossary) でんぱとう：radio tower

At home

ホストファミリー：これからいちねんよろしくね。

ケイ：はい。よろしくおねがいします。これ、つまらないものですが。。

ホストファミリーのおかあさん：なにかしら。

ケイ：ぼくがやいたゆのみです。

ケイ：あーわれてる！もしかしてあのとき。

ホストファミリーのおかあさん：あらー。せっかくつくってくれたのに。ざんねんね。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of やく (dictionary form: やく)? [answer1]

to bake, to fire

2. What is the meaning of われてる (dictionary form: われる)? [answer2]

has been stopped

Reading Assignment with English glossary for Week 1 Day 1 Question 2

Please read the following text and answer the questions.

<Host Family 2>

Glossary

いちいん: a member of~

ながたび : a long trip

はし : the edge (of the bed)

しょうがない・しかたない : can't be helped

ホストファミリーのおかあさん : いぬはすき? かぞくのいちいんのハチよ。

ケイ : はい、だいすきです。ハチ、おいで一。なかよくしようね。

ホストファミリーのおかあさん : ながたびでつかれたでしょう。おやすみなさい。

ケイ : おやすみなさい。

ホストファミリーのおかあさん : こら、ハチ!

(ダダダダ。。。 Hachi is running to the bed)

ケイ : ハチ、ねたいから、ベッドからおりて。いぬはすきだけど、アレルギーがあるんだよね。。。

(Hachi ignores Kei.)

ケイ : うごかないから、しょうがないなあー。しかたないから、きょうはベッドのはしでねるよ。おやすみ。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of おりて (dictionary form: おりる)? [answer1]

to get down (from the bed)

asking the dog to get down from the bed

2. What is the meaning of うごかない (dictionary form: うごく)? [answer2]

not moving; doesn't move

Reading Assignment with English glossary for Week 1 Day 1 Question 3

Please read the following text and answer the questions.

<Train>

Glossary

しんがっき : new semester

すずもう : let's cool off (casual form)

のりおくれた : to miss a train

ちこく : to be late (for school, for work)

ケイ : 9がつになったけど、まだむしあついなあ。きょうからしんがっきのはじまりだー。がっこうまででんしゃで30ふんかかるね。。

(almost at the station)

ケイ : はやくいってえきですずもう。あのでんしゃはどこに行くのかな。ぼくのでんしゃはまだ5ふんある。

(at the station)

ケイ : いきさきのボタンをおして。。。ワクワクするなー。にほんのでんしゃにのるのははじめてだ。

(The train left)

ケイ : えー、しまった!とけいとまっていた。きがつかなかった。さっきのでんしゃにのりおくれた! さいしょのひからちこくだ。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of いきさき ? [answer1]

destination

2. What is the meaning of とまっていた ? [answer2]

has been stopped

Reading Assignment with English glossary for Week 1 Day 1 Question 4

Please read the following text and answer the questions.

(After the Corona virus pandemic)

Glossary

うみ : ocean

けいけん : experience

かんがえる : to think

とりあえず : for the time being

ケイ : コロナパンデミックがおわったらなにをしようかなあ。。。なにかたのしいことしたいなあ。

(Daydreaming)

ケイ : まず、ハチをくるまにのせて、ともだちとうみにいこう。うみでみんなといっしょにバーバキューをして。。。。

しばらくけいけんしていないから、かんがえるのはたのしいなー。

(getting up)

ケイ : はやくいきたくなってきた。とりあえず、きょうのところはハチをつれていこう。ハチいくよ。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of のせて ? [answer1]

to take (someone) on board, to give a ride

2. What is the meaning of つれていこう ? [answer2]

to take someone to somewhere

Reading Assignment with English glossary for Week 1 Day 2 Question 1

Please read the following text and answer the questions.

<Haunted House 1>

Glossary

かいらんばん : community circular notice (that you pass on among neighbors)

ほうこくする : to report

ぶきみ : spooky

ホストファミリーのおかあさん : これ、おとなりのかとうさんにとどけてくれる？

ケイ : はい。いいですよ。かいらんばんですか。いってきます。

(In front of Kato's)

ケイ : このいえだ。これをおしてみよう。だれかいるかな。

(ピンポン)

ケイ : どんなひとがすんでいるのかな。。。だれもいないみたいだな。かえっておかあさんにほうこくしよう。だれにもあえなくてざんねんだったな。。

ケイ : えっ。ドアがあいた！だれかいるのかな。もういちどもどろう。なんかぶきみなおとがしたなあ。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of おして ? [answer1]

to push

2. What is the meaning of あいた ? [answer2]

(the door) opened

Reading Assignment with English glossary for Week 1 Day 2 Question 2

Please read the following text and answer the questions.

<Haunted House 2>

Please read the passage and answer the questions regarding the underlined words. The words could be a noun, an adjective or a verb.

Glossary

おばけ: Ghost

すず: bell

にげる: to run away

ケイ: ごめんください。だれかいますかー。さっきドアがあいたけど。。。でも、いえのなかはまっくらだけど。

ケイ: なんかこわいなあ。いやなおとがしたし。おばけかもしれない。すみませーん。

ケイ: あ、でんきがついた。だれかくる。すずのおとがする。なんかこわいから、にげようかな。。。。

かとう: あら、どなた? こづつみですか。

ケイ: (thoughts) よかった。おばけじゃなかった。

ケイ: いえ、となりのさとうさんのいえにホームステイしているものです。かいらんばんです。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of まっくら? [answer1]

pitch dark

2. What is the meaning of ついた? [answer2]

(the light) turns on

Reading Assignment with English glossary for Week 1 Day 2 Question 3

Please read the following text and answer the questions.

Please read the passage and answer the questions regarding the underlined words. The words could be a noun, an adjective or a verb.

Glossary

まよう : hard to decide

ひつよう : necessary

ケイ : きょうはてんきもいいし、せつかくにほんにいるから、デパチかにいってなにかおいしいものをかおう！

おみせのひと : いらっしゃいませ～。

ケイ : わあー、ぜんぶおいしそうー。なににしようかまようなあー。ふとるけどあまいものも、ときにはひつよう。。。。

おみせのひと : いらっしゃいませ

ケイ : ケーキがきれいにならんでる！どれもおいしそうできめられないなあ。じゃあ、おもいきって。。

ケイ : (ぜんぶたべたい) あの一、チョコケーキをひとつと、りんごケーキをひとつとまっちゃんケーキをひとつとティラミスをつくください。あの一、ともだちとたべるんです。

おみせのひと : かしこまりました。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of ならんでる ? [answer1]

(some things) are lined up

2. What is the meaning of きめられない ? [answer2]

cannot decide

Reading Assignment with English glossary for Week 1 Day 1 Question 4

Please read the passage and answer the questions regarding the underlined words. The words could be a noun, an adjective, or a verb.

Glossary

しんさく : a brand-new product

しゅうしょく : getting a full-time permanent job

おみせのひと : おもちかえりのおじかんはどのぐらいかかりますか。

ケイ : すぐですから 30 ぷんぐらいです。

おみせのひと : かしこまりました。ではほれいざいをひとつ、いれておきます。よくひやしておめしあがりください。

ケイ : はい。ありがとうございます。

(In the department store)

ケイ : あのジーンズもすてきな。あーあのふく、かっこいいなあー。しんさくだね。しゅうしょくしないとかえないな。

ケイ : さあ、うちにかえってケーキをたべよう。

(at home)

ケイ : しまった。。。ひやしてくださいっていったのに。。。。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of ほれいざい? [answer1]

an ice pack

2. What is the meaning of ひやして? [answer2]

to cool (something)

Reading Assignment with English glossary for Week 1 Day 3 Question 1

Please read the following text and answer the questions.

<March>

Glossary

くうき : air

いれかえる : to exchange

はな : flower

たくはいびん : delivery

はるいちばん : strong wind that occur at the start of spring

ケイ : きょうはてんきがいいから、まどをあけよう。ときどきくうきをいれかえたいね。

(outside with Hachi)

ケイ : あたたかくなってきたからはながさきはじめたね。

ケイ : あれ。。。きゅうにかぜがつよくなってきた。はやくかえろう。たくはいびんもきてるかもしれないし。

(came home)

ケイ : しまった。。。まどをあけたままだった。はるいちばんをわすれてた。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of あけよう (Dictionary form: あける)? [answer1]

let's open

to open

2. What is the meaning of はじめた (dictionary form: はじめる)? [answer2]

to start

Reading Assignment with English glossary for Week 1 Day 3 Question 2

Please read the following text and answer the questions.

<Taking a walk>

Please read the passage and answer the questions regarding the underlined words. The words could be a noun, an adjective or a verb.

Glossary

るすばん : staying home

よう : errands

ひきだす : to withdraw money

しんぴん : brand-new

ケイ : きょうはまどをしめてでかけよう。このあいだはしめるのわすれたから。。。

(talking to Hachi, the dog)

しばらくるすばんね。ごめんね。きょうはさんぽにいけないよ。だいじなようがあるから。いそいでるよ。

ハチ : (thinking)きょうはおかねをひきだしにいくのかな。え～。いっちゃった。そとにいきたかったのに。。おなかもちうてる。。。

ケイ : ただいま。どうなっちゃったの。。。へやをこんなによごして！わたしのしんぴんのくつ！

ハチ : ごめんなさい

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of しめて ? [answer1]

to close

2. What is the meaning of よごして ? [answer2]

to make things dirty

Reading Assignment with English glossary for Week 1 Day 3 Question 3

Please read the following text and answer the questions.

<Party>

Glossary

コロナウィルス : corona virus

おわる : to come to an end

ゆめ : dream

もらった: to receive

しみ: stain

され : the order form of さる meaning to “go away”

ケイ : はやくコロナウィルスがなくなってほしいなあ。。。おわったらみんなであつまってパーティーだ！

(In his dream)

ケイ : いいねー。このジュースはおいしいからすきー！

ともだち : ジュースひえているよー

ケイ : ムニャムニャ

ケイ : みんなとパーティーができるのってなんてたのしいんだろう。パーティーのあとはみんなでえいがにいきたいなあ。。。

(waking up from his dream)

ケイ : つめたい！なんだ～、ゆめか。。。ともだちにもらったジーンズがしみになっちゃう。。。きがえよう。なんでもいいけど、はやくコロナよ、され～。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of あつまって？[answer1]

to gather

2. What is the meaning of ひえている？[answer2]

to be chilled

Reading Assignment with English glossary for Week 1 Day 3 Question 4

Please read the following text and answer the questions.

(Department Store)

Glossary

あきた : the plain past/short form past form of あきる (to get tired of)

きたない : dirty (i-adjective)

にてる : the casual way of saying にている, meaning it's similar to something

きづかなかった : the casual way of saying きがつかなくった, meaning "I didn't notice"

どろぼう : thief

ケイ : オンラインショッピングはあきたし、きょうはくつをかいたいからデパートにいこう。

ケイ : すみませーん、さいふ、おとしましたよ。

ケイ : すみませーん。なんでいっちゃうんだろう。。なんかよごれててきたないさいふだなあ。

ケイ : あれ、なんかわたしがもってたのににてる。。。きづかなかったな。

ケイ : あれ、これはきょねんわたしがおとしたさいふだ！あれ！？っていうことはどろぼう？

ケイ : こらーまてー

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

Question 4

1. What is the meaning of おとして ? [answer1]

to drop

2. What is the meaning of よごれて ? [answer2]

to become dirty

Reading Assignment with English glossary for Week 1 Day 4 Question 1

Please read the following text and answer the questions.

<After a Party>

Glossary

みち : road

こんでない: not be crowded

よろこんで : te-form of よろこぶ, meaning to become happy

おさら : dish

あらう : to wash

さいこうきゅう : supreme grade

はず : is supposed to be

まめ : beans

さとう : sugar

しお : salt

ともだち : ばんごはん、ごちそうさまでした。とてもおいしかったです。

おとうさん : いいえ、またきてくださいね。

おかあさん : みちがこんでないといいけど。

おかあさん : よろこんでもらえてよかったわ。

おとうさん : たくさんたべましたね。さあ、じゃあ、みなでおさらをあらいましょ
う。

おかあさん : あれーコーヒーすきだっっていったのにのこってる。どうしてかな。

おとうさん : ほんとうだこっちのもだね。さいこうきゅうのコーヒーまめのはずだけ
ど。

おとうさん : ぜんぜんのんでないみたいだね。

ケイ : どうしてかな。

ケイ : あーごめんなさい! さとうとしおをまちがえました!

おかあさん : えーせっかくのおいしいコーヒーが。。。。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

Question 1

1. What is the meaning of のこってる (のこる) ? [answer1]

to remain

2. What is the meaning of まちがえました (まちがえる) [answer2]

I made a mistake. (To make a mistake.)

Reading Assignment with English glossary for Week 1 Day 4 Question 2

Please read the following text and answer the questions.

<Laundry >

Please read the passage and answer the questions regarding the underlined words. The words could be a noun, an adjective or a verb.

Glossary

けっこう : staying home

せんたくもの:errands

—ておいた: do something in advance for future convenience

ケイ：きょうはけっこうたのしかったなあ。テストもおわったし。ホストファミリーのおかあさんとばんごはんでもつくろうかな。

おかあさん：おかえり、ケイ

ケイ：おかあさん、ただいまー。せんたくもの、たくさんありますね。

おかあさん：ケイのへやにせんたくものたまってたから、せんたくしておいたよ。

ケイ：すみません。おかあさん。

ケイ：そうだった！にほんはせんたくものをそとにだしてかわかすだったよね。だいじょうぶだったかな。

おかあさん：ケイー、これケイのせんたくものね。

ケイ：すみません。ありがとうございます。

ケイ：ぼくのパンツ、きんじょのひとにみられたね。。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of たまってた (たまる) ? [answer1]

to be piled up; be accumulated

2. What is the meaning of かわかす (かわかす) ? [answer2]

to dry (something)

Reading Assignment with English glossary for Week 1 Day 4 Question 3

Please read the following text and answer the questions.

<Rainy Season>

Glossary

きがめいる : feels depressing

～にかざる : ~is the best thing to do

しらないうちに : without noticing

りょうかい: I got it!

おなかすいた: to get hungry

ユイ : まいにちまいにち、あめばかりでいやになるね。

ケイ : ほんとだね。きがめいるね。なにかたのしいことしよう。

ケイ : あめのひはゲームにかざるね。。

ケイ : そのゾンビたおして

ユイ : (thinking)じつはこのゲーム、しょしんしゃだよ。

ユイ : りょうかい！このゾンビ？

ケイ : ちがう ちがう！それじゃない！

ユイ : あーごめんまちがえた！もういつかいしよう。

ユイ : あれ？しらないうちにあさになってる。。。あめもやんだよ。

ケイ : ほんとだ。。。そろそろおなかすいたし、てんきもいいから、どこかいこうよー。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of たおして (たおす) ? [answer1]

to knock down

2. What is the meaning of ちがう (ちがう) ? [answer2]

to be wrong; is wrong

Reading Assignment with English glossary for Week 1 Day 4 Question 4

Please read the following text and answer the questions.

(Convenience Store)

Glossary

24じかんえいぎょう : open 24 hours

きって : postage stamps

おにぎり : rice balls

おでん : boiled vegetables and fish cakes

だいこん : radish

たまご : egg

あじ : flavor

ケイ : おなかはすいてるけど、こんなあさはやく、どこもおみせは、やってないよね？

ユイ : コンビニは、やってるとおもうよ。

ケイ : あー、やってるやってる。よかったー。24 じかんえいぎょうだね。

ケイ : そういえばおかねがないからおかねをおろすね。

ユイ : なにかおうかなー。きってもかおう。

ユイ : おにぎりにしよう。おべんとうもおいしそう。。サンドイッチもたべたいなあ。

ケイ : おでんにしよう。

ケイ : だいこんとたまごがいいかな。

みせのひと : いらっしゃいませ。

ユイ : おにぎりなにものこってない！

ユイ : たくさんかったね。

ケイ : だってぜんぶのあじたべてみたいから。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

Question 4

1. What is the meaning of おかねをおろす？ [answer1]

to withdraw money

2. What is the meaning of のこって (のこる) ？ [answer2]

to be left

Reading Assignment with English glossary for Week 2 Day 1 Question 1

Please read the following text and answer the questions.

<Fall Appetite>

Glossary

さいきん: recently; these days

しょくよく: appetite

みかく: flavor

さんま: a kind of fish (pacific saury)

うらめしや: I resent you

いのち: life

つぶって: te-form of つぶる meaning to close one's eyes

ケイ: さいきんすずしくなって、きのいろもかわってきたなあ。あかやきいろがきれいだね。

ケイ: あきはにほんでは「しょくよくのあき」というらしい。ぜんぶおいしそうー♡

おとうさん: きょうはあきのみかくのさんまだよ。

おかあさん: さかなはすき？

ケイ: はい、すきです。

ケイ: さかなのめがぼくをみてる。。。うらめしや～

おかあさん: のこさないでたべてね。さかなのいのちをもらってるから。

ケイ: はい。

ケイ: めをつぶってくれないかなあ。。そんなにみられるとたべにくいよ。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1 かわって(かわる)

to change

2 のこさないで(のこす)

to not leave something

Reading Assignment with English glossary for Week 2 Day 1 Question 2

Please read the following text and answer the questions.

<Christmas>

Glossary

じき: season

こいしい: miss (person, place, etc.)

おいおい: to celebrate

いつもまして: more than usual

におい: smell

ケイ: やっぱりこのじきになるとちがこいしいなあ。おかあさんのつくるごはんがたべたいなあ。

ケイ: にほんのひともクリスマスをおいおいするんだね。クリスチャンはすくなそうだけど。

ケイ: いつもましてひとがおおいなあ。。。

ケイ: どうしてあんなにひとがいるんだろう。それにどんどんひとがふえてる。

ケイ: にほんのクリスマスはどんなものたべるのかなー?

ケイ: おすし?

ケイ: おとうさんとおかあさんにいいプレゼントみつけたからかえろう。

ケイ: ただいまー。いいにおいがしますね。ごちそうは?

おとうさん: おかえりー。メリークリスマス、ケイ!

おかあさん: クリスマスにフライドチキンたべたいよね?

ケイ: えー

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of ふえてる (ふえる) ? [answer1]

(something) increases

2. What is the meaning of みつけた (みつける) ? [answer2]

found something (to find something)

Reading Assignment with English glossary for Week 2 Day 1 Question 3

Please read the following text and answer the questions.

<Year-end Cleaning>

Glossary

はこ : box

わかい : young

ケイ : ただいまー。おかあさん、なにしてるんですか。

おかあさん : おかえりー。おおそうじしてるのよ。

おかあさん : おおそうじはあたらしいとしがくるまえにいえのなかをきれいにするのよ。

ケイ : なるほどー。てっだいましょうか。

おかあさん : そう？このはこはもうふるいから、はこのなかのしゃしんをこっちはこにうつしてくれる？

ケイ : はい、もちろんです。

ケイ : おかあさん、このしゃしんのひとはだれですか。とってもきれいなひとですねー。

おかあさん : そ、そう？ありがとう。。。おはずかしい。。。おとうさんもわかいでしょ？

ケイ : あ、もしかしてこれはおかあさんのわかいときのしゃしんですね！

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of うつして (dictionary form: うつす) ? [answer1]

to shift something; to move something to a different place

2. What is the meaning of はずかしい (dictionary form:はずかしい) ? [answer2]

to be embarrassed

Reading Assignment with English glossary for Week 2 Day 1 Question 4

Please read the following text and answer the questions.

(Kite flying)

Glossary

かるた : card game in Japan

たこ : kite/octopus

かぜ : wind

のせる : to let it ride

そら : sky

あんぜん : safe

ケイ : おしょうがつにこどもがよくするあそびはなんですか。

おかあさん : わたしはかるたかな。

おとうさん : わたしがちいさいころはよくたこあげをしたなあ。

ケイ : カルタはきいたことあるんですが、たこあげはなんですか。たこをあげてたべるんですか。

おとうさん : ハハハ。そのたこじゃないよ。

おとうさん : かみでつくったたこをかぜにのせてそらにあげるんだよ。

ケイ : おもしろそうですね。

ケイ : おとうさん、たかくあがりましたねー。

おとうさん : きょうはかぜが強いからねー。

ケイ : どうやっておろすんですかー。どうすればあんぜんにできるかわかりませーん。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of あげる (Dictionary form: あげる) ? [answer1]

to raise something up high

2. What is the meaning of おろす (Dictionary form: おろす) ? [answer2]

to get something down

Reading Assignment with English glossary for Week 2 Day 2 Question 1

Please read the following text and answer the questions.

<Valentine's Day >

Glossary

あげる : to give

らしい : it seems

うりあげ : sales

ぎりチョコ : obligatory chocolate

こうきゅう : high quality

ともチョコ : friendship chocolate

たいじゅう : body weight

ケイ : ことしももうすぐバレンタインデーだなあ。にほんではおんなのひとがチョコレートあげるらしいね。

ケイ : ぼくもひとつぐらいはもらえるかな。。。

ケイ : にほんのバレンタインデーのうりあげはいちねんのうりあげの10%なんだって。

ケイ : おかあさんからのぎりチョコだ。ぎりでもうれしいね。こうきゅうチョコレート、おいしそう！

ケイ : ひとついただき！うーん、おいしい。もうひとつもらおう！どんどんへるね。

ケイ : さいきんチョコレートばかりたべてたから。。ユイちゃんからもともチョコもらったし。。。

ケイ : ショック！たいじゅうふえた。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of へる (Dictionary form: へる) ? [answer1]

something decreases.

2. What is the meaning of ふえた (ふえる) ? [answer2]

something increases

Reading Assignment with English glossary for Week 2 Day 2 Question 2

Please read the following text and answer the questions.

<Graduation Season >

Please read the passage and answer the questions regarding the underlined words. The words could be a noun, an adjective or a verb.

Glossary

そつぎょう: graduation

しょうらい: future

おたがいに: each other

しゅうかつ: job hunting

どうそうかい: class reunion

ユイ: そつぎょうシーズンだね。

ケイ: そうだね。

ユイ: そつぎょうしたらどんなしごとがしたいの?

ケイ: そうだねえーにほんにのこってにほんのかいしゃにしゅうしょくしたいとおもってるよ。

ケイ: ゆいはしょうらいなにになりたいの?

ユイ: そうだね。。。わたしはかいがいではたらいてみたいな。

ユイ: おたがいにがいこくぐらしになりそうだね。

ケイ: そうだね。しゅうかつがんばろう!

ケイ: どうそうかいがたのしみだね。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of のこって (のこる) ? [answer1]

something/someone remains in a location

2. What is the meaning of しゅうしょく ? [answer2]

to getting employment

Reading Assignment with English glossary for Week 2 Day 2 Question 3

Please read the following text and answer the questions.

(Flower Viewing)

Please read the passage and answer the questions regarding the underlined words. The words could be a noun, an adjective or a verb.

Glossary

さくら : cherry blossom

にほんてき : Japanese-like

じゅうどう : Judo, a martial art in Japan

からて : karate, a martial art in Japan

ぶんか : culture

はいく : haiku

かきつばた : iris (flower)

わかもの : young people

ケイ : にほんのだいがくにはいろんなサークルがあるねー。

ユイ : そうだね。ケイはどんなサークルにはいりたいの？

ケイ : さくらがきれいだなあー。

ケイ : なにかにほんにしかないサークルがいいかな。

ケイ : にほんてきなサークルってなにかなあ。。。じゅうどうとか、からてとか？

ケイ : でも、ぼくはうんどうにがてだからなあー。もっとにほんのぶんかをたのしめるサークルがいいなあ。

ケイ : おはなみサークルなんてどう？はなをみにいって。。。はいくをつくるんだ。さくらのつぎはかきつばたやアジサイがさくね。

ユイ : うん、いいんじゃない？ケイがつくれば？

ユイ : にほんのだいがくせいはいくるかなあ。。。わかものはこないかも。。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of にがて ? [answer1]
someone is not good at doing something

2. What is the meaning of アジサイ ? [answer2]
hydrangea (a kind of flower)

Reading Assignment with English glossary for Week 2 Day 2 Question 4

Please read the passage and answer the questions regarding the underlined words. The words could be a noun, an adjective or a verb.

Glossary

こいのぼり : carp streamer

かざる : to decorate

ちまき : snack made with rice powder

きをつけて : watch out

あぶない : dangerous

ケイ : きょうはこどものひだー。こいのぼりをかざったり、ちまきをたべたりするんだよね。

おとうさん : おかあさん、ケイにこいのぼりをみせてあげたいんだけど、こいのぼりはどこかな？

おかあさん : しりませんよ。きょねんかたづけたよね？

ケイ : おとうさん、なにしてるんですか。

おとうさん : こいのぼりをかざろうとおもって、いまポールをたてているんだ。

ケイ : そうですか。

ケイ : あ、おとうさんたおれますよ。きをつけて。

おとうさん : わしもまだまだわかいね。

ケイ : あー、よかった。あぶなかったですね。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of かたづけた (かたづける) ? [answer1]

to put something away

2. What is the meaning of たおれます (たおれる) ? [answer2]

(something) falls down

Reading Assignment with English glossary for Week 2 Day 3 Question 1

Please read the following text and answer the questions.

<Tea Time>

Glossary

きゅうけい : a break

とりあえず: for the time being

きぶん : feeling

とりこむ : to take (the laundry) inside

しまった! : Oh no!

さめる : something becomes cold

ケイ : もうずっとべんきょうしてるからつかれたなあー。きゅうけいしよう。

ケイ : もうくらくなくなってきたね。

ケイ : なにかのもうかな。とりあえず、おゆをわかして。。。きょうはどんなきぶん？
やっぱりおちゃにしよう。

ケイ : でんきをつけて。。。と あ、そうそう、せんたくものとりこむのわすれてた。
とりこまなくちゃ。

ケイ : しまった! おちゃのことわすれてた。さめちゃったね。もういちどおゆをわかさなくちゃ。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of わかして (わかす) ? [answer1]

to boil water

2. What is the meaning of つけて (つける) ? [answer2]

to turn on (the light)

Reading Assignment with English glossary for Week 2 Day 3 Question 2

Please read the following text and answer the questions.

<Rice with Raw Egg >

Please read the passage and answer the questions regarding the underlined words. The words could be a noun, an adjective or a verb.

Glossary

みそしる : miso soup

たまごかけごはん: rice with raw egg

なまたまご: raw egg

まぜて: to mix

しょうゆ : soy sauce

れいぞうこ : fridge

ほぞん : to keep, to preserve

しょくざい : ingredients

ちょうせん : to give it a try

ケイ : おとうさん、おはようございます。おいしそうですね。なにをたべているんですか。

おとうさん : あさごはんはみそしるとたまごかけごはんがいちばんだよ！

ケイ : えー、おとうさん、なまたまごをわってごはんにまぜてそのままたべるんですか。

ちょっとしょうげきです。

おとうさん : ハハハ、しょうゆもかけるよ。

ケイ : そういえばにほんのスーパーではたまごはれいぞうこにはいっていませんね。だいじょうぶですか。

おとうさん : そうだね。

おとうさん : たまごはじつはながいあいだだいじょうぶなしょくざいなんだよ。

ケイ : そうなんですね。じゃあ、ぼくもたまごかけごはんちょうせんしてみます。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of わって (Dictionary form: わる) ? [answer1]

to crack (something)

2. What is the meaning of はいって (Dictionary form: はいる) ? [answer2]

to be inside, to enter

Reading Assignment with English glossary for Week 2 Day 3 Question 3

Please read the following text and answer the questions.

<Jogging>

Glossary

うんどうぶそく : lack of exercise

くうき : air

けしき : scenery

こわい: to be scared

うまれかわり: reborn

みたい : as though~

ケイ : さいきんうんどうぶそくだからうんどうしなくちゃ。

ユイ : わたしも。

ケイ : じゃあ、あさ、いっしょにジョギングなんてどう？

ケイ : もしもし、おはよう

ユイ : おこしてっていったんだけどなあ。。。あ、おきた？ジョギングいくよー。

ケイ : きょうはたくさんはしったね。

ユイ : そうだね。にしゅうかんぐらいつづけようよ。

ケイ : にしゅうかんならできるかな。いいよ。

ユイ : いいけしきもみられるし。

ケイ : くうきもおいしい

ケイ : わあ！ねこだ！ねここわい！にげろー

ユイ : かわいいねこじゃん。ねずみのうまれかわりみたいにこわがらなくたって

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of おこして (Dictionary form:おこす) ? [answer1]
to wake someone up
2. What is the meaning of つづけよう (Dictionary form: つづける) ? [answer2]
to continue (something), Let's continue (something)

Reading Assignment with English glossary for Week 2 Day 3 Question 4

Please read the following text and answer the questions.

(Homework)

Glossary

おなじ : same

じむいん : office staff

いっぽん: one line

にほん : two lines

ケイさんらしくない : unlike you

こんしゅうのぶん : this week's portion

せんせい : ケイさんはまたおなじかんじがダメだね。きのうもなおしたのに。どうすればなおるかな。。。

せんせい : あ、あそこでうちのじむいんとはなしてる。

せんせい : あ、ケイさんちょっとー。はなしたいことがあるんだけど。

ケイ : はい、せんせい。なにか。

せんせい : きょうなおしたしゅくだいだけど、ここはいっぽんじゃなくてにほんですね。

せんせい : きょうおしえたばかりですよ。ケイさんらしくないですね。どうかしたんですか。

ケイ : ごめんなさい、せんせい。

ケイ : じつはせんしゅうとてもひまだったのでこんしゅうのぶんのしゅくだいをまとめてしてしまったんです。だから、そのしゅくだいはせんしゅうしたんです。すみません。

せんせい : えー

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

Question 4

1. What is the meaning of なおした (Dictionary form: なおす) ? [answer1]
corrected (or to correct)

2. What is the meaning of まとめて (Dictionary form: まとめる) ? [answer2]
to put together

Reading Assignment with English glossary for Week 2 Day 4 Question 1

Please read the following text and answer the questions.

<Graduation Ceremony>

Glossary

そつぎょう : graduation

はかま : a traditional garment in Japan

はな: flower

うまれてはじめて : for the first time in my life

こい : love

ケイ : おとうさん、あのひとたちはなんですか。はたちのひとですか。

おとうさん : ああ、あれはそつぎょうしきだよ。

ケイ : みんなきれいですね。

おとうさん : はいているものは、はかまっていうんだよ。

おとうさん : さんがつはそつぎょうシーズンなんだよ。

ケイ : すみません。はながとれましたよ。

おとうさん : ケイ、やさしいね。

おんなのこ : あーすみません。ありがとうございます。

ケイ : (inner voice) ぼくはうまれてはじめてこいにおちたよ。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

Question 1

1. What is the meaning of とれました (Dictionary form: とれます) ? [answer1]

to come out; to come off

2. What is the meaning of おちた (Dictionary form: おちる) ? [answer2]

to fall

Reading Assignment with English glossary for Week 2 Day 4 Question 2

Please read the following text and answer the questions.

<Part-time Job >

Please read the passage and answer the questions regarding the underlined words. The words could be a noun, an adjective, or a verb.

Glossary

ぶんか : culture

ふたり : two people

とくべつ : special

てんぷらていしょく : tempura set

(お) ねうち : a good deal

わりかん : to split the tab

はらう : to pay

ケイ : いらっしゃいませ～

おきやくさん : ふたりです。

ケイ : ファミレスでアルバイトしているといろいろなひとにあう。にほんのぶんかもわかるようになってきた。

ケイ : きょうのとくべつメニューはてんぷらていしょくです。きょうはいつもの1000えんが900えんにさがっています。

おきやくさん : なににします？

おきやくさん : そうね。おねうちね。

おきやくさん : わりかんにしようね。

おきやくさん : すみません、ひとりずつはらいます。

ケイ : レストランでのおかねのはらいかたはひとそれぞれ。。。

おきやくさん : きょうはわたしがだすね。

おきやくさん : そんなのだめよ。きょうはわたしがだすね。

ケイ : どっちでもいいですよー。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of さがっています (Dictionary form: さがる) ? [answer1]
to go lower

2. What is the meaning of だす ? [answer2]
to pay money for

Reading Assignment with English glossary for Week 2 Day 4 Question 3

Please read the following text and answer the questions.

<Moving>

Glossary

ひっこし : moving

じゅんび : preparation

すすむ : to progress

にもつ : luggage

たいりよく : physical strength

じしん : self-confidence

にもつ : luggage

かぎ : key

おぼえて : to remember

はこ : box

ともだち : きょうはひっこしのひだね。じゅんびはすすんでる？
ケイ : まだまだ。。まだトラックにのせるにもつがたくさんあるよ。
ともだち : じゃあ、てつだうよ。たいりよくにはじしんがあるよ。
ケイ : ほんと？ありがとう。
ともだち : ふー。やっとおわった！
ケイ : あれ？トラックのかぎは？
ケイ : どこにおいたかおぼえてない。もしかしたら、あのはこのなかかも。
ともだち : えー。。。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

1. What is the meaning of のせる (のせる) ? [answer1]
to load up
2. What is the meaning of おわった (おわる) ? [answer2]
something finishes

Reading Assignment with English glossary for Week 2 Day 4 Question 4

Please read the following text and answer the questions.

(Returning Home)

Glossary

なれた : the plain past/short form past, meaning “to get used to~”

せいかつ: daily life

たからもの : treasure

もどる : to return

おとうさん : きょうはどうとうケイのそうべつかいのひになっちゃったね。

ユイ : さみしくなるね。

おかあさん : せっかくにほんになれたのにね。

ケイ : ぜひアメリカにあそびにきてください。

おとうさん : このいちねんでいちばんたのしかったことはなに？

ケイ : たのしかったことはたくさんあって、かんがえてもわかりません。

ケイ : おとうさんとおかあさんといっしょにせいかつできたのがたからものです。

ケイ : ぼくはにほんのかいしゃではたらきたいので、またにほんにもどってきます。ありがとうございます。

Please infer the meaning of the underlined word as best as you can. If you are not sure, use your best judgement. **If you cannot guess the meaning, please type 0.**

Question 4

1. What is the meaning of そうべつかい ? [answer1]

farewell party

2. What is the meaning of かんがえても (Dictionary form: かんがえる) ? [answer2]

to think about

Two-Week Delay Post-Reading Assessment Week 3

(Delay Post-Reading Assessment from Week 1 Day 1 vocabulary)
(The questions are the same for manga and English glossary groups.)

Week 3 Day 1 Question 1 (same questions as Week 1 Day 1 Question 1)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of やく (dictionary form: やく) ? [answer1]

to bake, to fire

2. What is the meaning of われてる (dictionary form: われる) ? [answer2]

has been broken

Week 3 Day 1 Question 2 (same questions as Week 1 Day 1 Question 2)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of おりて (dictionary form: おりる) ? [answer1]

to get down (from the bed)
asking the dog to get down from the bed

2. What is the meaning of うごかない (dictionary form: うごく) ? [answer2]

not moving; doesn't move

Week 3 Day 1 Question 3 (same questions as Week 1 Day 1 Question 3)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of いきさき ? [answer1]

destination

2. What is the meaning of とまってた ? [answer2]

has been stopped

APPENDIX F

Tables and Figures (Results)

Test Results by Section: Pretest

Table F1

Descriptive Statistics for Pretest Scores

	Mean	N	Std. Deviation	Std. Error Mean
PreTest before <i>Manga</i> task	3.48	42	3.677	.567
PreTest before Glossary task	3.79	42	4.359	.673

Table F2

Paired Samples Test

	Paired Differences						Significance		
	95% Confidence						One-Sided <i>p</i>	Two-Sided <i>p</i>	
	Std. Deviation	Std. Error	Interval of the Difference		<i>t</i>	df			
	Mean	Mean	Lower	Upper					
PreTest <i>Manga</i> task – PreTest Glossary task	-.310	2.311	.357	-1.030	.411	-.868	41	.195	.390

Table F3***Pretest Paired Samples Effect Sizes***

				95% Confidence Interval	
				Lower	Upper
		Standardizer ^a	Point Estimate		
PreTest <i>Manga</i> task –	Cohen's d	2.311	-.134	-.437	.171
PreTest Glossary task	Hedges' correction	2.354	-.131	-.429	.168

Research Question 1**Table F4*****Descriptive Statistics for Vocabulary score through Manga and Glossary***

	Mean	N	Std. Deviation	Std. Error Mean
<i>Manga</i>	13.69	42	6.319	.975
Glossary	8.71	42	6.094	.940

Assumption Testing for Research Question 1

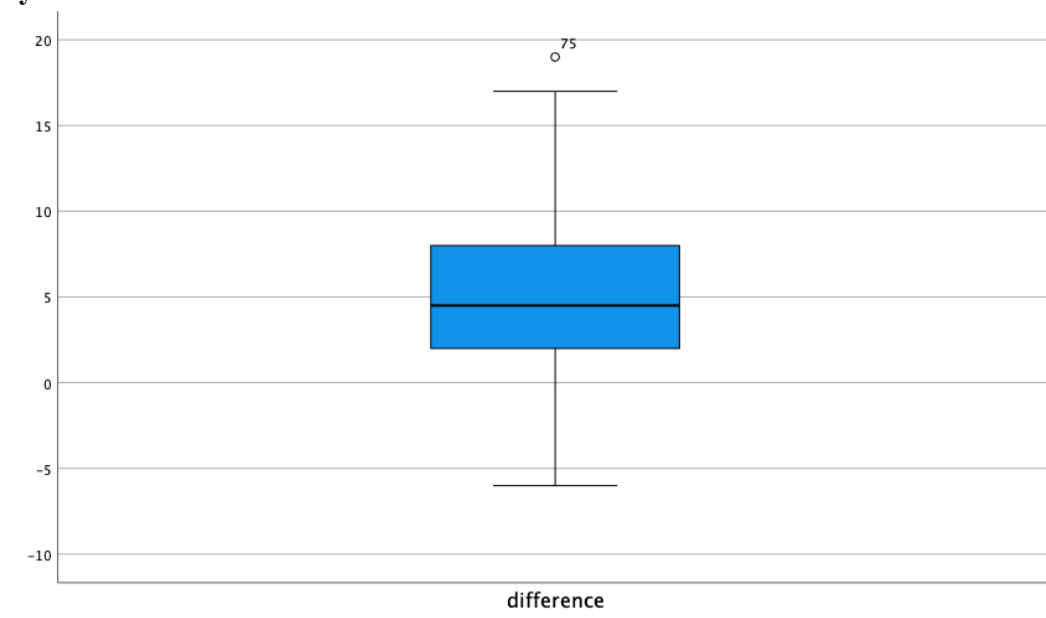
Assumption testing was performed to ensure non-biased test results. When using a paired sample t-test, four assumptions must be met. The first assumption is that one dependent variable should be a continuous variable. In the current study, the dependent variable is the vocabulary score which ranges from 0 to 32. Therefore, this assumption was met. The second assumption is that the independent variable should consist of two categorical groups. In the current study, the same participants read two different text types and answered questions on unfamiliar vocabulary,

and their vocabulary test mean score for each text type was compared. Therefore, the second assumption was met as well.

The third assumption is that there should be no significant outliers on the difference between the paired values. The difference was calculated, and boxplots were created in SPSS (see Figure F1).

Figure F1

Boxplot of Difference for Vocabulary Inference Score through *Manga* and through Glossary



One outlier was detected at more than 1.5 box-lengths from the edge of the box in a boxplot. The researcher double-checked for any data-entry or measurement errors; however, no errors were found. When examining each value closely, this participant's vocabulary test scores for text with English glossary were 0, 0, 1, 0 for each day, and 7, 3, 5, 5 for each day through *manga*. This may be a sign that this participant benefitted greatly from the *manga*. It was determined to keep this value in the analysis.

The fourth assumption is that the distribution of the difference in the dependent variable should be approximately normally distributed. The difference scores for reading through English glossary and through *manga* reading were normally distributed, as assessed by Shapiro-Wilk's test ($p = .190$). Therefore, the fourth assumption was met (see Table F5).

Table F5

Vocabulary Inference Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
difference	.104	42	.200*	.963	42	.190

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

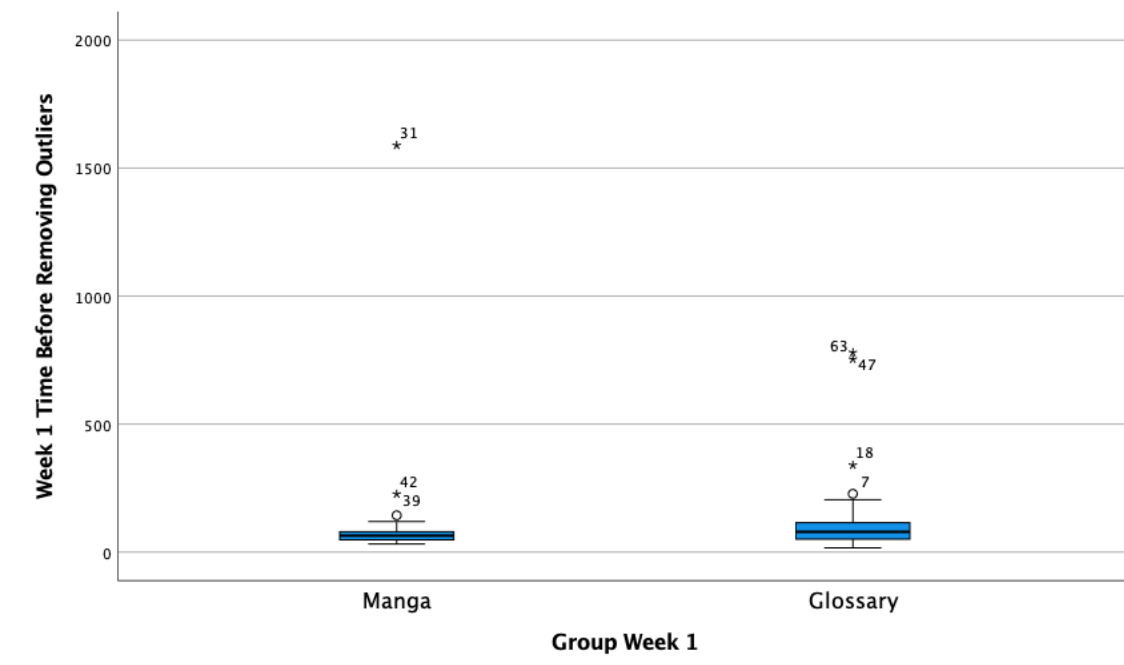
Research Question 2

Removing Outliers

Using boxplots and common knowledge, outliers were again closely examined. For Week 1, the time that participants spent on testing was indicated in the boxplot. The boxplot (Figure F2) indicated that the ID # 18, 31, 42, 47, 63 were extreme outliers, and the ID # 7 and 39 were mild outliers. ID #63 did not complete the *manga* task; therefore, this case was removed from the data set.

Figure F2

Boxplot for Week 1 Time Spent Detecting Outliers



The weekly time that the participants spent on testing was closely examined. The number indicates time spent, in minutes, on the task. When examined closely, 289 minutes is 4.81 hours, 1443 minutes is 24 hours, 492 minutes is 8.2 hours, and 652 minutes is 10.8 hours, it was determined that these outliers should be removed from the study. ID #42 spent 227 minutes for the total of Week 1, but the time spent each day is not as extraordinary number as others (46 minutes, 35 minutes, 77 minutes, 69 minutes). Likewise, ID #39 does not have any unrealistic daily times (63 minutes, 76 minutes, 21 minutes, 45 minutes) examined (see Table F6). As a result, it was determined to keep ID #42 and ID #39 in the study.

Table F6***Time Suspected Outliers for Week 1: Time (minutes)***

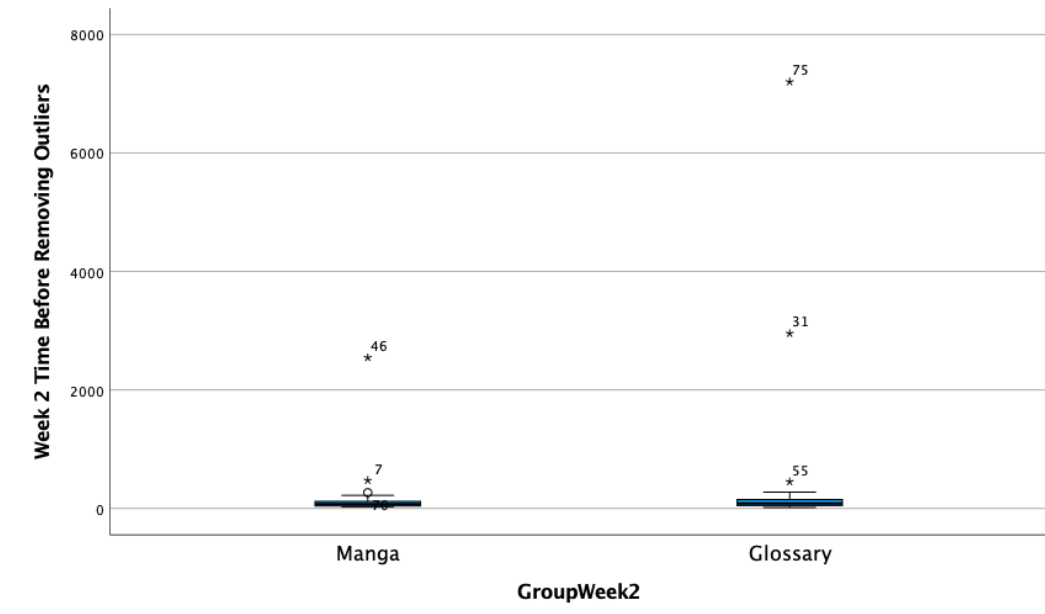
Participant	Week 1	Week 1	Week 1	Week 1	Week 1
ID	Day 1	Day 2	Day 3	Day 4	Total
7	154	19	23	32	228
18	15	12	24	289	340
31	17	63	66	1443	1589
39	63	76	21	45	144
42	46	35	77	69	227
47	492	164	96	28	780
63	34	32	652	36	754

In summary for Week1, based on the close examination methods above, ID #7, #39, #42 were determined not to be outliers. ID #18, 31, and 47, on the other hand, were determined to be outliers and were removed from the data set as was #63 for incompleteness of tasks.

Week 2 followed the same method of examination as Week 1, and a boxplot from SPSS was obtained (Figure F3).

Figure F3

Boxplot for Time Suspected Outliers for Week 2: Time (minutes)



The boxplot indicated that ID #7, 31, 46, 55, 75 were extreme outliers, and ID # 28 was a mild outlier. The participant ID #46 and #55 did not complete the glossary task and the *manga* task respectively and these two cases were removed from the data set. Table F7 displays the time that suspected outliers spent in completing the week 2 task.

Table F7

Time Suspected Outliers for Week 2: Time (minutes)

Participant ID	Week 2 Day 1	Week 2 Day 2	Week 2 Day 3	Week 2 Day 4	Week 2 Total
7	21	17	430	6	474
28	176	17	68	15	276
31	36	1478	1438	3	2955
75	9	927	2828	3438	7202

When comparing the time that these participants spent in Week 1 and Week 2, ID #7 participant spent 430 minutes in Week 2 Day 3. That means that participant #7 spent 7.16 hours in completing the Week 2 Day 3 task. Comparing that to other times that the participant spent (21, 17, 6 minutes), it is unlikely that this participant spent more than seven hours to complete the task. Therefore, ID #7 was removed as an outlier. For ID # 28, this participant spent 176 minutes (2.93 hours) to complete Week 2 Day 1 task. However, this was not an unrealistic time. Therefore, it was determined that ID #28 would remain in the data set. For ID #31, the participant spent 1478 minutes (24.6 hours) in Week 2 Day 2 and 1438 minutes (23.97 hours) in Week 2 Day 3. It is unlikely that this participant spent approximately 24 hours for both days. Therefore, ID #31 was removed from the data set. For ID number #75, the participant spent 927 minutes (15.45 hours) in Week 2 Day 2, 2828 minutes (47.13 hours) in Week 2 Day 3 and 3438 minutes (57.3 hours) in Week 2 Day 4. It is unlikely that someone spent this amount of time on the task, so ID #75 was removed from the data set.

In summary, among suspected outliers, ID #7, #31 and #75 were removed as outliers for Week 2. The ID #31 appeared as an outlier for both weeks. Therefore, for both weeks, five cases of ID #7, #18, #31, #47 and #75 were removed from the data set.

Assumption Testing for Research Question 2

In order to detect how the times that participants spent on tasks were distributed among the *manga* and the glossary texts, histograms were created (Figure F4 and Figure F5).

Figure F4

Histogram for Time Distribution for Manga

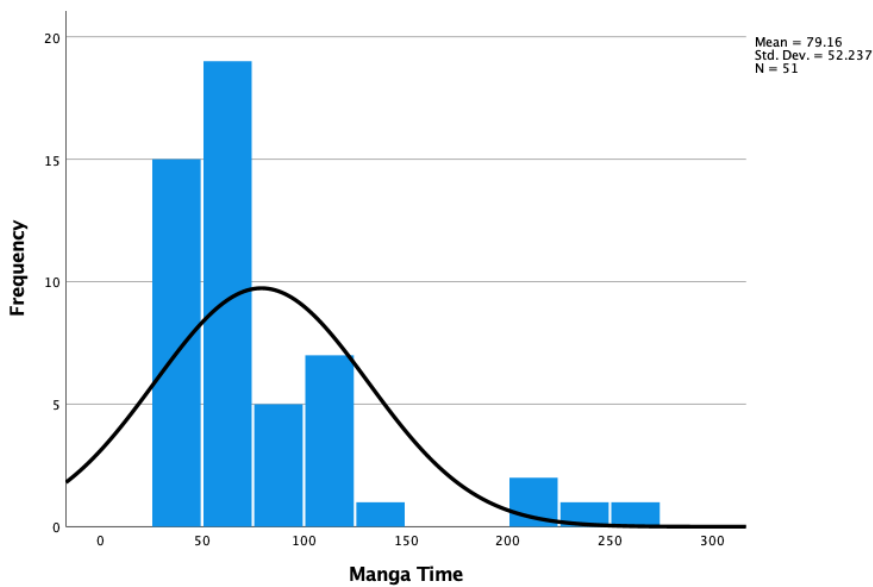
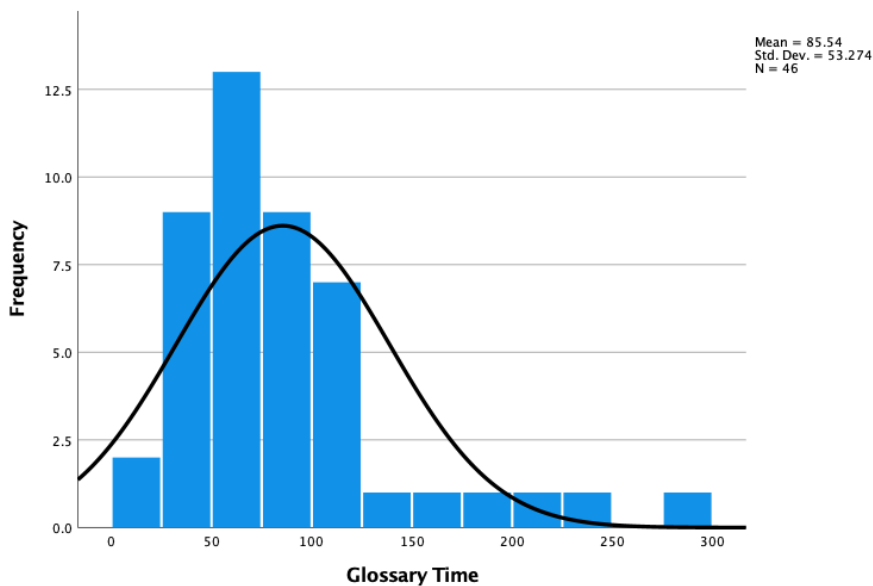


Figure F5

Histogram for Time Distribution for Glossary



The histograms indicated that the times were not normally distributed. The Shapiro-Wilk's tests were run to confirm the distribution (Table F8, Table F9, Table F10), and it was

confirmed the time distribution for both *manga* and English glossary were not normally distributed ($p < .05$).

Table F8

Descriptive Statistics for Time Spent

Reading Manga

<i>Manga</i> Time		Statistic	Std. Error
Mean		79.16	7.315
95% Confidence Interval for Mean	Lower Bound	64.46	
	Upper Bound	93.85	
5% Trimmed Mean		72.86	
Median		68.00	
Variance		2728.695	
Std. Deviation		52.237	
Minimum		28	
Maximum		267	
Range		239	
Interquartile Range		46	
Skewness		2.048	.333
Kurtosis		4.257	.656

Descriptive Statistics for Time Spent

Reading Text with English Glossary

Glossary Time		Statistic	Std. Error
Mean		85.54	7.855
95% Confidence Interval for Mean	Lower Bound	69.72	
	Upper Bound	101.36	
5% Trimmed Mean		80.38	
Median		72.50	
Variance		2838.165	
Std. Deviation		53.274	
Minimum		16	
Maximum		276	
Range		260	
Interquartile Range		54	
Skewness		1.727	.350
Kurtosis		3.574	.688

Table F9

Tests of Normality for Time Spent Reading Manga

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
<i>Manga</i> Time	.239	51	<.001	.765	51	<.001

a. Lilliefors Significance Correction

Table F10

Tests of Normality for time spent reading with English glossary

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Glossary Time	.149	46	.012	.848	46	<.001

a. Lilliefors Significance Correction

Figure F6

Continuous Field Information: Time Spent Through Manga

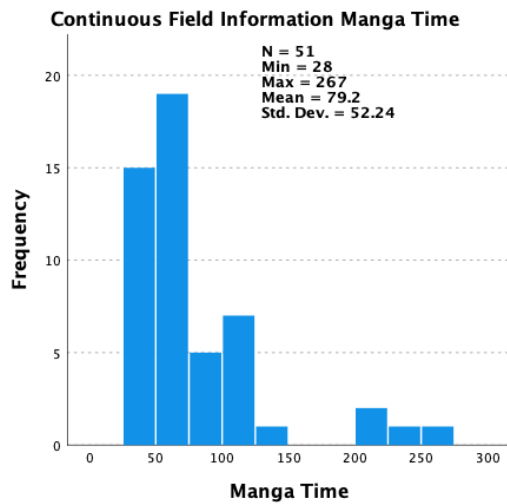


Figure F7

Continuous Field Information: Time Spent Through Glossary

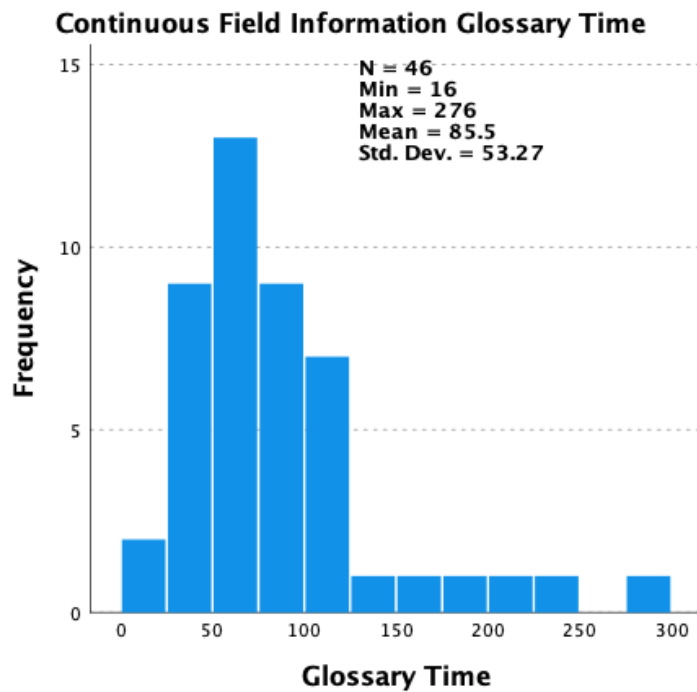


Table F11***Case Processing Summary***

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
<i>Manga</i>	51	68.0%	24	32.0%	75	100.0%
Time						
Glossary	46	61.3%	29	38.7%	75	100.0%
Time						
difference	37	49.3%	38	50.7%	75	100.0%

Research Question 3**Assumption Testing for Research Question 3**

The first three assumptions were related to the study design and measurement choice. The first assumption was that the study had a continuous dependent variable, and this study measured the score of vocabulary tests, which is a continuous variable ranging from 0 to 32. Therefore, the first assumption was met.

The second assumption was that there should be two independent variables that have two or more categorical independent groups. In this study, there were two different text types that were given to the same participants, and the vocabulary tests were administered at three different points in time. Therefore, the second assumption was met.

The third assumption was that the study should have independence of observation. This study implemented a crossover design, and each participant took one type of text only once.

Therefore, the third assumption was met. There were two participants who accidentally took both tests, and their cases were removed from the data set.

Fourth Assumption

Table F12

Descriptives for the difference of pretest and inference score through manga text

Measure: MEASURE_1

TextType	Time	Dependent Variable
1	1	Pretest before <i>manga</i> text
	2	Inference score through <i>manga</i>
	3	Retention score through <i>manga</i>
2	1	Pretest before glossary text
	2	Inference score through glossary text
	3	Retention score through glossary text

Table F13

Descriptive Statistics for Research Question 3

	Mean	Std. Deviation	N
PreTest before <i>Manga</i>	3.87	3.711	30
Inference score through <i>Manga</i>	14.27	6.308	30
Retention score through <i>Manga</i>	8.90	6.707	30
PreTest before glossary	4.33	4.693	30

Inference score through glossary	9.37	6.272	30
Retention score through glossary	8.00	6.373	30

Figure F8

Boxplot for Manga Inference Score

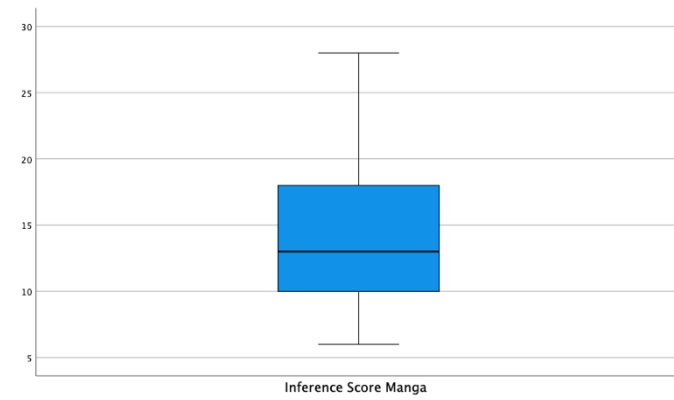


Figure F9

Boxplot for Manga Retention Score

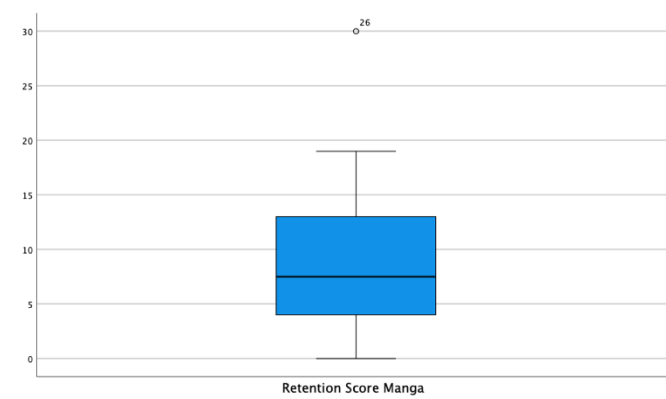


Figure F10

Boxplot for Glossary Inference Score

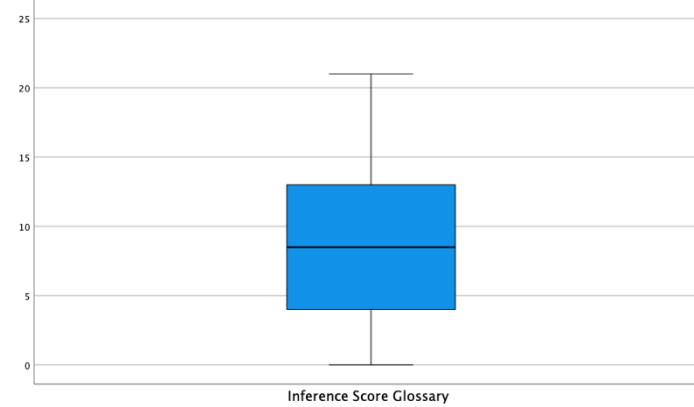
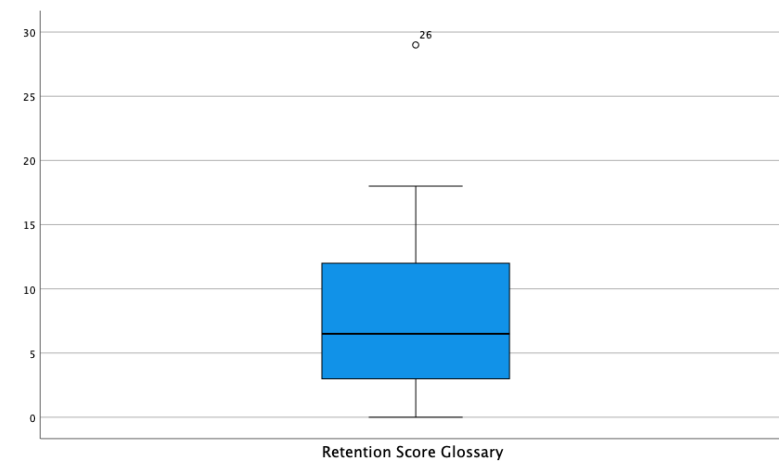


Figure F11

Boxplot for Glossary Retention Score



To further investigate outliers, the six residuals dialogue boxes were examined in SPSS as shown in Table F14.

Table F14

Detecting Outliers for Research Question 3

 IDRQ3	 SRE_MINF	 SRE_MRET	 SRE_GINF	 SRE_GRET
74	.	.	.	.
75	.	.	.	.
18	-1.33	-1.20	-.71	-.96
15	-1.17	-1.35	-.55	-1.28
70	-1.17	-.74	-.06	-.16
8	-1.01	-1.05	-1.36	-1.28
10	-1.01	-.59	-.38	.00
11	-1.01	-.29	.75	-.32
30	-1.01	-.14	-.87	.64
33	-.69	-.74	-.71	-.80
47	-.69	-1.20	-.22	-1.12
65	-.69	.32	-.71	.00
4	-.53	-.89	-1.19	-.96
9	-.53	-.29	-1.52	-1.28
29	-.53	-.89	.59	-.48
37	-.53	-.44	-.87	-.80
20	-.20	.02	-.06	-.32
36	-.20	1.53	-.71	.80
52	-.04	-.14	-.87	-.48
22	.12	1.08	.59	1.12
38	.12	.77	.59	1.60
49	.12	-.89	-.06	-.48
17	.44	.92	.59	.80
35	.60	.62	.75	.96
59	.60	-.59	-.87	-.48
56	.76	.32	-1.19	-.64
69	.76	.47	1.89	.48
28	.92	-.29	.59	.32
25	1.73	-.14	1.24	.48
40	1.73	1.53	1.72	.32
26	2.21	3.20	1.72	3.35
64	2.21	1.08	1.89	.96

For SRE_MINF, which indicates a studentized residual value for the inference vocabulary score through *manga* text, there were no outliers detected.

For SRE_MRET, which indicates a studentized residual value in the vocabulary retention score through *manga* text, the results indicated that the scores of ID #26 was outlier. The vocabulary score in a two-week delay retention test through *manga* text had a studentized residual value of 3.20.

For SRE_GINF, which indicated the inference vocabulary score through glossary text, no outliers were detected.

For SRE_GRET, which indicated a studentized residual value for the vocabulary retention score through glossary text, the results indicated that the scores of ID #26 was an outlier. The vocabulary score for the two-week delay retention test through glossary text had a studentized residual value of 3.35. Just as in SRE_MRET, ID #26 performed extremely well compared to other participants. This may simply indicate that ID #26 participant is a high achiever who managed to learn the vocabulary through a single exposure.

Based on the above observations, the detected outliers were not unusual. The researcher went back to check for any data entry errors and measurement errors. However, none such cases were detected. Therefore, the researcher determined to keep all vocabulary score values.

Table F15

Assumption Testing for RQ3: Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Studentized Residual for Inference <i>Manga</i>	30	40.0%	45	60.0%	75	100.0%
Studentized Residual for Retention Score <i>manga</i>	30	40.0%	45	60.0%	75	100.0%
Studentized Residual for PreTest Glossary	30	40.0%	45	60.0%	75	100.0%
Studentized Residual for Inference Glossary	30	40.0%	45	60.0%	75	100.0%
Studentized Residual for Retention Score glossary	30	40.0%	45	60.0%	75	100.0%

Table F16

Descriptives for Residuals

			Statistic	Std. Error
Studentized Residual for Inference Score <i>manga</i>	Mean		.0000	.18570
	95% Confidence	Lower	-.3798	
	Interval for Mean	Bound		
		Upper	.3798	
		Bound		
	5% Trimmed Mean		-.0520	
	Median		-.2042	
	Variance		1.034	
	Std. Deviation		1.01710	
	Minimum		-1.33	
	Maximum		2.21	
	Range		3.55	
	Interquartile Range		1.41	
	Skewness		.808	.427
	Kurtosis		-.173	.833
Studentized Residual for Retention Score <i>manga</i>	Mean		.0000	.18570
	95% Confidence	Lower	-.3798	
	Interval for Mean	Bound		

		Upper	.3798	
		Bound		
		5% Trimmed Mean	-0.0747	
		Median	-.2123	
		Variance	1.034	
		Std. Deviation	1.01710	
		Minimum	-1.35	
		Maximum	3.20	
		Range	4.55	
		Interquartile Range	1.44	
		Skewness	1.177	.427
		Kurtosis	1.866	.833
Studentized Residual	Mean		.0000	.18570
for Inference Score	95% Confidence	Lower	-.3798	
Glossary	Interval for Mean	Bound		
		Upper	.3798	
		Bound		
		5% Trimmed Mean	-.0234	
		Median	-.1405	
		Variance	1.034	
		Std. Deviation	1.01710	
		Minimum	-1.52	

	Maximum		1.89	
	Range		3.41	
	Interquartile Range		1.50	
	Skewness		.483	.427
	Kurtosis		-.849	.833
Studentized Residual	Mean		.0000	.18570
for Retention Score	95% Confidence	Lower	-.3798	
glossary	Interval for Mean	Bound		
		Upper	.3798	
		Bound		
	5% Trimmed Mean		-.0827	
	Median		-.2394	
	Variance		1.034	
	Std. Deviation		1.01710	
	Minimum		-1.28	
	Maximum		3.35	
	Range		4.63	
	Interquartile Range		1.48	
	Skewness		1.237	.427
	Kurtosis		2.584	.833

Fifth Assumption for Research Question 3
Table F17

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Studentized Residual for <i>Manga</i> Inference	.164	30	.038	.913	30	.018
Studentized Residual for <i>Manga</i> Retention Score	.153	30	.070	.915	30	.021
Studentized Residual for Glossary Inference	.157	30	.058	.925	30	.037
Studentized Residual for Glossary Retention Score	.123	30	.200*	.908	30	.014

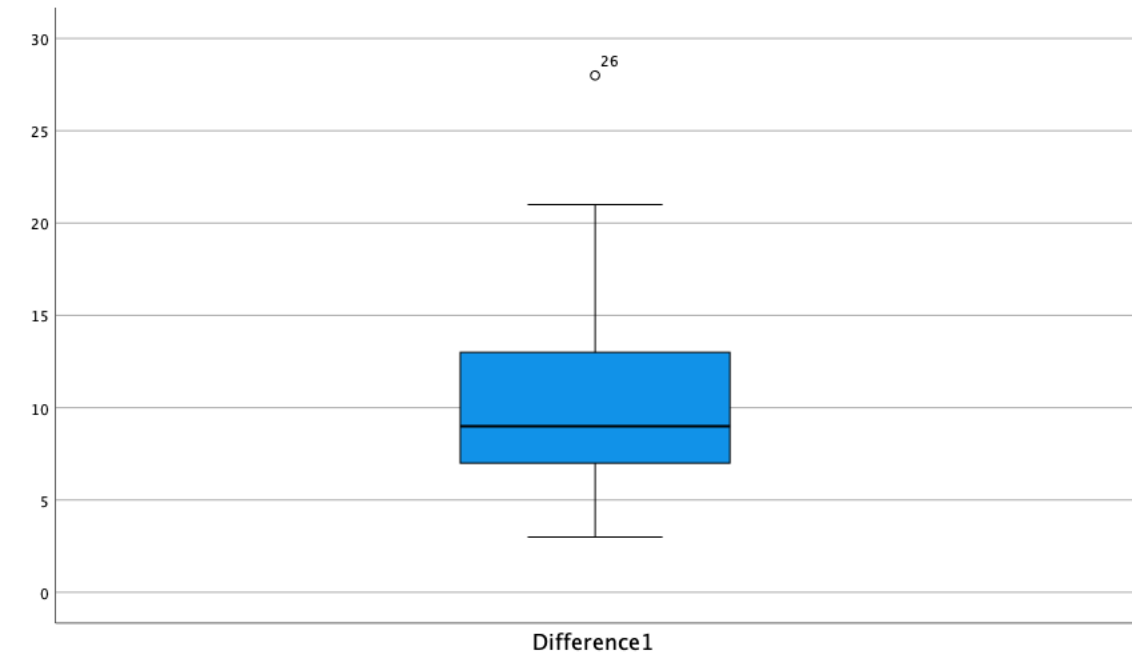
*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Assumption Testing for t-tests for RQ3

Figure F12

Detecting Outliers for t-test of pretest and inference scores through manga text



The boxplot indicated that ID#26 was an outlier. When the pretest and inference scores through *manga* were examined, ID #26 scored 0 before *manga* reading, but scored 28 out of 32. The researcher confirmed that there were no input errors.

Table F18***Descriptives for the difference of pretest and inference score through manga text***

			Statistic	Std. Error
Difference1	Mean		10.40	.930
	95% Confidence Interval for Mean	Lower Bound	8.50	
		Upper Bound	12.30	
	5% Trimmed Mean		9.93	
	Median		9.00	
	Variance		25.972	
	Std. Deviation		5.096	
	Minimum		3	
	Maximum		28	
	Range		25	
	Interquartile Range		6	
	Skewness		1.631	.427
	Kurtosis		4.004	.833

The assumption is that the distribution of the difference in the dependent variable should be approximately normally distributed. The difference scores for pretest and inference tests reading through *manga* were normally distributed, as assessed by Shapiro-Wilk's test ($p = .002$). Therefore, the assumption was met (see Table F19).

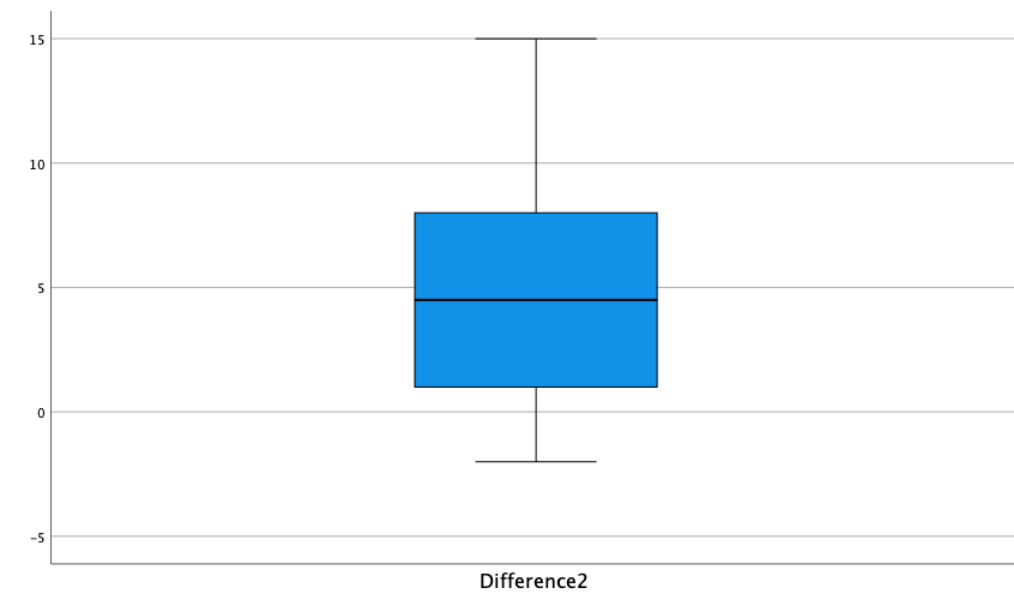
Table F19***Tests of Normality for Difference between pretest and inference for manga text***

Kolmogorov-Smirnov ^a				Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Difference1	.142	30	.129	.875	30	.002

a. Lilliefors Significance Correction

Figure F13

Detecting Outliers for t-test of pretest and inference score through glossary text



The boxplot indicated that there were no outliers for the difference between pretest and inference tests through glossary text.

Table F20

Descriptives for the difference of pretest and inference score through glossary text

			Statistic	Std. Error
Difference2	Mean		5.03	.843
	95% Confidence Interval for Mean	Lower Bound	3.31	
		Upper Bound	6.76	
	5% Trimmed Mean		4.87	
	Median		4.50	
	Variance		21.344	
	Std. Deviation		4.620	
	Minimum		-2	

Maximum	15	
Range	17	
Interquartile Range	7	
Skewness	.496	.427
Kurtosis	-.616	.833

The difference scores for pretest and inference tests reading through glossary were normally distributed, as assessed by Shapiro-Wilk's test ($p = .199$). Therefore, the assumption was met (see Table F21).

Table F21

Tests of Normality for the difference of pretest and inference score through glossary text

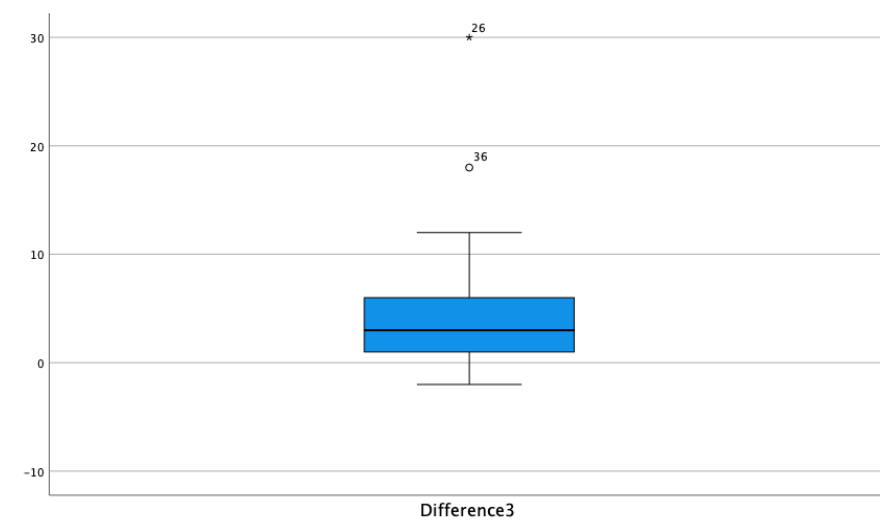
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Difference2	.111	30	.200*	.953	30	.199

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Figure F14

Detecting Outliers for t-test of pretest and retention score through manga text



The boxplot indicated that ID#26 was an extreme outlier, and ID#36 was an outlier. When the pretest and retention scores through *manga* were examined, ID #26 scored 0 before *manga* reading, but scored 30 out of 32 in retention test. The researcher confirmed that there were no input errors. Likewise, ID#36 scored one in the pretest and scored 19 on the retention test. The researcher confirmed that there were no input errors.

Table F22

Descriptives for the difference of pretest and retention score through manga text

			Statistic	Std. Error
Difference3	Mean		5.03	1.150
	95% Confidence Interval for Mean	Lower Bound	2.68	
		Upper Bound	7.39	
	5% Trimmed Mean		4.22	
	Median		3.00	
	Variance		39.689	
	Std. Deviation		6.300	
	Minimum		-2	
	Maximum		30	
	Range		32	
	Interquartile Range		5	
	Skewness		2.538	.427
	Kurtosis		8.141	.833

Table F23

Tests of Normality for the difference of pretest and retention score through manga text

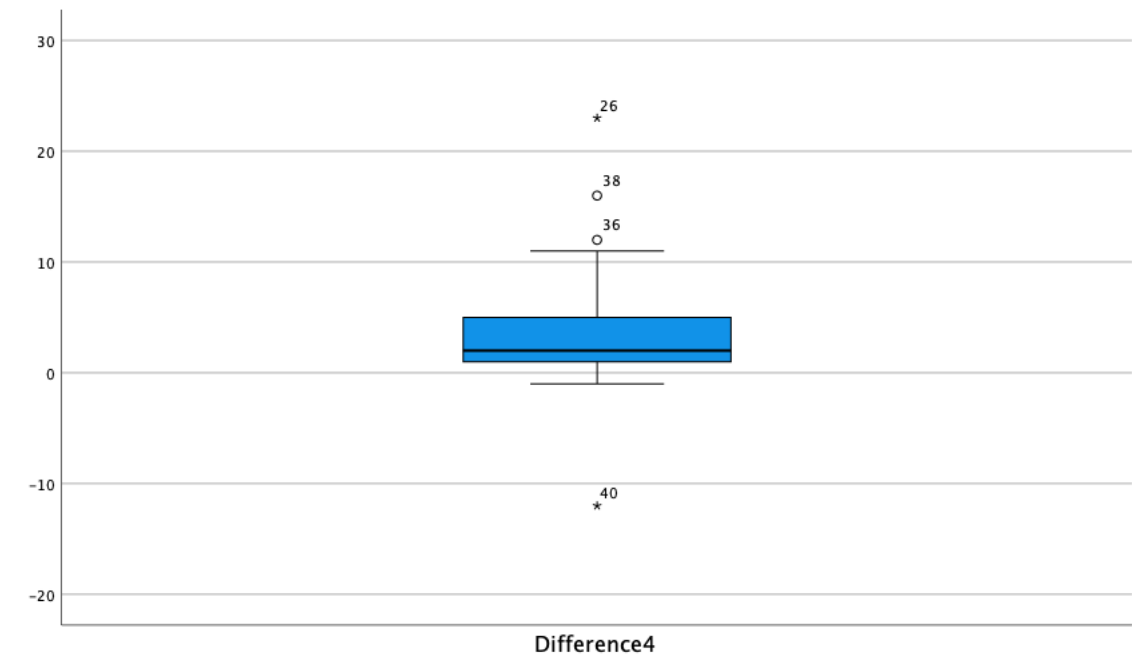
Kolmogorov-Smirnov ^a				Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Difference3	.206	30	.002	.747	30	<.001

a. Lilliefors Significance Correction

The difference scores for pretest and retention tests reading through *manga* were not normally distributed, as assessed by Shapiro-Wilk's test ($p < .001$). In terms of Type I error, the paired-samples t-test is robust to violation of normality (Fradette et al., 2003; Posten, 1979; Rasch & Guiard, 2004; Wiedermann & von Eye, 2013 as cited in Laerd Statistics), and therefore, the researcher should use caution when interpreting the data.

Figure F15

Detecting Outliers for t-test of pretest and retention score through glossary text



The boxplot indicated that ID#26 and ID#40 were extreme outliers, ID#36 and ID#38 were mild outliers. When the pretest and retention scores through glossary were examined, ID #26 scored 6 before glossary reading, but scored 29 out of 32 in retention test, ID#36 scored one in pretest and scored 13 in retention test. ID#38 scored two in pretest and 18 in retention test.

ID#40 scored 22 in pretest and scored 10 in retention test. The researcher confirmed that there were no input errors. It was suspected that the participant did not fully concentrate on the task as the task seemed easy or the participant may have been affected by the expectancy effect thinking *manga* should be effective in retaining more vocabulary.

Table F24

Descriptives for the difference of pretest and retention score through glossary text

			Statistic	Std. Error
Difference4	Mean		3.67	1.134
	95% Confidence Interval for Mean	Lower Bound	1.35	
		Upper Bound	5.99	
	5% Trimmed Mean		3.39	
	Median		2.00	
	Variance		38.575	
	Std. Deviation		6.211	
	Minimum		-12	
	Maximum		23	
	Range		35	
	Interquartile Range		5	
	Skewness		.955	.427
	Kurtosis		3.366	.833

Table F25

Tests of Normality for the difference of pretest and retention score through glossary text

Kolmogorov-Smirnov ^a				Shapiro-Wilk		
Statistic						
	ic	df	Sig.	Statistic	df	Sig.
Difference4	.243	30	<.001	.841	30	<.001

a. Lilliefors Significance Correction

The difference scores for pretest and retention tests reading through glossary were not normally distributed, as assessed by Shapiro-Wilk's test ($p < .001$), therefore, the researcher should use caution when interpreting the data.

Table F26

Tests of Within-Subjects Effects: Interaction of Text Types and Time with Pretest Score as Covariates

Measure: MEASURE_1

		Type III Sum		Mean		
		of Squares	df	Square	F	Sig.
Source						
Text	Sphericity	83.310	1	83.310	6.523	.017
	Assumed					
Text *	Sphericity	12.027	1	12.027	.942	.340
	Assumed					
PretestManga	Sphericity					
	Assumed					
Text *	Sphericity	6.190	1	6.190	.485	.492
	Assumed					
PretestGlossary	Sphericity					
	Assumed					
Error(Text)	Sphericity	344.845	27	12.772		
	Assumed					
Time	Sphericity	41.040	1	41.040	2.249	.145
	Assumed					
Time *	Sphericity	75.089	1	75.089	4.115	.052
	Assumed					
PretestManga	Sphericity					
	Assumed					

Time *	Sphericity	22.438	1	22.438	1.230	.277
PretestGlossary	Assumed					
Error(Time)	Sphericity	492.687	27	18.248		
	Assumed					
Text * Time	Sphericity	92.620	1	92.620	18.994	<.001
	Assumed					
Text * Time *	Sphericity	2.049	1	2.049	.420	.522
PretestManga	Assumed					
Text * Time *	Sphericity	11.040	1	11.040	2.264	.144
PretestGlossary	Assumed					
Error (Text*Time)	Sphericity	131.661	27	4.876		
	Assumed					

APPENDIX G

Vocabulary Pretest

Pre-assessment of knowledge of vocabulary set 1 for Week 1 (Days 1, 2, 3, & 4)

Manga/English Group Pretest Week 1

This is a pretest. Please answer whether you have previously seen the following words. If you **don't know the meaning** of the word, please **enter a 0** in the column. If **you know the meaning** of the word, **write the meaning of the word in English** in the column. Please **do NOT look up** the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please don't spend too much time on each question.

1

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

おくる

2

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

やく

3

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

ほれいざい

4

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

いためる

5

Please answer whether you have previously seen the following words. If you haven't seen the word, please enter a 0 in the column. If you know the meaning of the word, write the meaning of the word in English in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please don't spend too much time on each question.

つく

6

Please answer whether you have previously seen the following words. If you haven't seen the word, please enter a 0 in the column. If you know the meaning of the word, write the meaning of the word in English in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please don't spend too much time on each question.

うける

7

Please answer whether you have previously seen the following words. If you haven't seen the word, please enter a 0 in the column. If you know the meaning of the word, write the meaning of the word in English in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please don't spend too much time on each question.

あける

8

Please answer whether you have previously seen the following words. If you haven't seen the word, please enter a 0 in the column. If you know the meaning of the word, write the meaning of the word in English in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please don't spend too much time on each question.

こむ

9

Please answer whether you have previously seen the following words. If you haven't seen the word, please enter a 0 in the column. If you know the meaning of the word, write the meaning of the word in English in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please don't spend too much time on each question.

どうろ

10

Please answer whether you have previously seen the following words. If you haven't seen the word, please enter a 0 in the column. If you know the meaning of the word, write the meaning of the word in English in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please don't spend too much time on each question.

おりる

11

Please answer whether you have previously seen the following words. If you haven't seen the word, please enter a 0 in the column. If you know the meaning of the word, write the meaning of the word in English in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please don't spend too much time on each question.

よごれる

12

Please answer whether you have previously seen the following words. If you haven't seen the word, please enter a 0 in the column. If you know the meaning of the word, write the meaning of the word in English in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please don't spend too much time on each question.

いりぐち

13

Please answer whether you have previously seen the following words. If you haven't seen the word, please enter a 0 in the column. If you know the meaning of the word, write the meaning of the word in English in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please don't spend too much time on each question.

われる

14

Please answer whether you have previously seen the following words. If you haven't seen the word, please enter a 0 in the column. If you know the meaning of the word, write the meaning of the word in English in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please don't spend too much time on each question.

いきさき

15

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

おす

16

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

おぼえる

17

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

たおす

18

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

かいだん

19

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

あつまる

20

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

しめる

21

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

おぼえる

22

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

のせる

23

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

まがる

24

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

つれていく

25

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

のこる

26

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

うごく

27

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

あつまる

28

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

ふつう

29

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

えらぶ

30

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

とまる

31

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

あく

32

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

まっくら

33

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

ならぶ

34

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

よろこぶ

35

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

きめる

36

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

ひえる

37

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

よごす

38

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

おとす

39

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

はじめる

40

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

たまる

41

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

まちがえる

42

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

かわかす

43

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

ちがう

44

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

おろす

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

ひやす

Pre-assessment of knowledge of vocabulary set 2 for Week 2 (Days 1, 2, 3, & 4)

Manga/English Group Pretest Week 2

This is a pretest.

Please answer whether you have previously seen the following words. If you **don't know the meaning** of the word, please **enter a 0** in the column. If **you know the meaning** of the word, **write the meaning of the word in English** in the column. Please **do NOT look up** the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please don't spend too much time on each question.

1

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

かわる

2

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

かんがえる

3

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

さがる

4

Please answer whether you have previously seen the following words. If you haven't seen the word, please enter a 0 in the column. If you know the meaning of the word, write the meaning of the word in English in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please don't spend too much time on each question.

のこす

5

Please answer whether you have previously seen the following words. If you haven't seen the word, please enter a 0 in the column. If you know the meaning of the word, write the meaning of the word in English in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please don't spend too much time on each question.

かゝす

6

Please answer whether you have previously seen the following words. If you haven't seen the word, please enter a 0 in the column. If you know the meaning of the word, write the meaning of the word in English in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please don't spend too much time on each question.

にがて

7

Please answer whether you have previously seen the following words. If you haven't seen the word, please enter a 0 in the column. If you know the meaning of the word, write the meaning of the word in English in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please don't spend too much time on each question.

もうしこむ

8

Please answer whether you have previously seen the following words. If you haven't seen the word, please enter a 0 in the column. If you know the meaning of the word, write the meaning of the word in English in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please don't spend too much time on each question.

あじさい

9

Please answer whether you have previously seen the following words. If you haven't seen the word, please enter a 0 in the column. If you know the meaning of the word, write the meaning of the word in English in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

うける

10

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

ふえる

11

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

みつける

12

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

かりる

13

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

なおす

14

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

あげる

15

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

おろす

16

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

のせる

17

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

はいる

18

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

えらぶ

19

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

うつす

20

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

つつむ

21

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

わる

22

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

はずかしい

23

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

よろこぶ

24

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

まとめる

25

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

へる

26

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

おわる

27

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

あらう

28

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

ふえる

29

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

さます

30

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

おこす

31

Please answer whether you have previously seen the following words. If you haven't seen the word, please enter a 0 in the column. If you know the meaning of the word, write the meaning of the word in English in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please don't spend too much time on each question.

のこる

32

Please answer whether you have previously seen the following words. If you haven't seen the word, please enter a 0 in the column. If you know the meaning of the word, write the meaning of the word in English in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please don't spend too much time on each question.

そうべつかい

33

Please answer whether you have previously seen the following words. If you haven't seen the word, please enter a 0 in the column. If you know the meaning of the word, write the meaning of the word in English in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please don't spend too much time on each question.

しゅうしょく

34

Please answer whether you have previously seen the following words. If you haven't seen the word, please enter a 0 in the column. If you know the meaning of the word, write the meaning of the word in English in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please don't spend too much time on each question.

だす

35

Please answer whether you have previously seen the following words. If you haven't seen the word, please enter a 0 in the column. If you know the meaning of the word, write the meaning of the word in English in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please don't spend too much time on each question.

むす

36

Please answer whether you have previously seen the following words. If you haven't seen the word, please enter a 0 in the column. If you know the meaning of the word, write the meaning of the word in English in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.
かたづける

37

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.
とれる

38

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.
にる

39

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.
たおれる

40

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.
こまる

41

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.
つづける

42

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

わかす

43

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

だます

44

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

つける

45

Please answer whether you have previously seen the following words. If **you haven't seen** the word, **please enter a 0 in the column**. If **you know** the meaning of the word, **write the meaning of the word in English** in the column. Please do NOT look up the meaning of any words that appear in this study.

Please answer intuitively whether or not you have seen the word. Please **don't spend too much time** on each question.

おちる

APPENDIX H

Two-Week Delay Post-Reading Assessment for Week 3 and Week 4

Two-Week Delay Post-Reading Assessment Week 3

(Delay Post-Reading Assessment from Week 1 Day 1 Vocabulary)
(The questions are the same for manga and English glossary groups.)

Week 3 Day 1 Question 4 (same questions as Week 1 Day 1 Question 4)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of のせて ? [answer1]

to take (someone) on board, to give a ride

2. What is the meaning of つれていこ う ? [answer2]

to take someone to somewhere

Two-Week Delay Post-Reading Assessment Week 3

(Delay Post-Reading Assessment from Week 1 Day 2 Vocabulary)
(The questions are the same for manga and English glossary groups.)

Week 3 Day 2 Question 1 (same questions as Week 1 Day 2 Question 1)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of おして ? [answer1]

to push

2. What is the meaning of あいた ? [answer2]

(the door) opened

Week 3 Day 2 Question 2 (same questions as Week 1 Day 2 Question 2)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of まっくら ? [answer1]

pitch dark

2. What is the meaning of ついた ? [answer2]

(the light) turns on

Week 3 Day 2 Question 3 (same questions as Week 1 Day 2 Question 3)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of ならんでる ? [answer1]

(some things) are lined up

2. What is the meaning of きめられない ? [answer2]

cannot decide

Two-Week Delay Post-Reading Assessment Week 3

(Delay Post-Reading Assessment from Week 1 Day 2 Vocabulary)

(The questions are the same for manga and English glossary groups.)

Week 3 Day 2 Question 4 (same questions as Week 1 Day 2 Question 4)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of ほれいざい ? [answer1]

an ice pack

2. What is the meaning of ひやして ? [answer2]

to cool (something)

Two-Week Delay Post-Reading Assessment Week 3
(Delay Post-Reading Assessment from Week 1 Day 3 Vocabulary)
(The questions are the same for manga and English glossary groups.)

Week 3 Day 3 Question 1 (same questions as Week 1 Day 3 Question 1)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of あけよう (Dictionary form: あける) ? [answer1]

let's open, to open

2. What is the meaning of はじめた (dictionary form: はじめる) ? [answer2]

to start

Week 3 Day 3 Question 2 (same questions as Week 1 Day 3 Question 2)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of しめて ? [answer1]

to close

2. What is the meaning of よごして ? [answer2]

to make things dirty

Week 3 Day 3 Question 3 (same questions as Week 1 Day 3 Question 3)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of あつまって ? [answer1]

to gather

2. What is the meaning of ひえている ? [answer2]

to be chilled

Two-Week Delay Post-Reading Assessment Week 3

(Delay Post-Reading Assessment from Week 1 Day 3 Vocabulary)
(The questions are the same for manga and English glossary groups.)

Week 3 Day 3 Question 4 (same questions as Week 1 Day 3 Question 4)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of おとして ? [answer1]

to drop

2. What is the meaning of よごれて ? [answer2]

to become dirty

Two-Week Delay Post-Reading Assessment Week 3

(Delay Post-Reading Assessment from Week 1 Day 4 Vocabulary)
(The questions are the same for manga and English glossary groups.)

Week 3 Day 4 Question 1 (same questions as Week 1 Day 4 Question 1)

Please answer the questions.

If you cannot remember the meaning, please type 0.

Question 1

1. What is the meaning of のこってる (のこる) ? [answer1]

to remain

2. What is the meaning of まちがえました (まちがえる) [answer2]

I made a mistake. (To make a mistake.)

Week 3 Day 4 Question 2 (same questions as Week 1 Day 4 Question 2)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of たまってた (たまる) ? [answer1]

to be piled up; be accumulated

2. What is the meaning of かわかす (かわかす) ? [answer2]

to dry (something)

Week 3 Day 4 Question 3 (same questions as Week 1 Day 4 Question 3)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of たおして (たおす) ? [answer1]

to knock down

2. What is the meaning of ちがう (ちがう) ? [answer2]

to be wrong; is wrong

Two-Week Delay Post-Reading Assessment Week 3

(Delay Post-Reading Assessment from Week 1 Day 4 Vocabulary)
(The questions are the same for manga and English glossary groups.)

Week 3 Day 4 Question 4 (same questions as Week 1 Day 4 Question 4)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of おかねをおろす ? [answer1]

to withdraw money

2. What is the meaning of のこって (のこる) ? [answer2]

to be left

Two-Week Delay Post-Reading Assessment for Week 4 Day 1

(Delay Post-Reading Assessment from Week 2 Day 1 Vocabulary)
(The questions are the same for manga and English glossary groups.)

Week 4 Day 1 Question 1 (same questions as Week 2 Day 1 Question 1)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. かわって (かわる)

to change

2. のこさないで (のこす)

to not leave something

Week 4 Day 1 Question 2 (same questions as Week 2 Day 1 Question 2)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of ふえてる (ふえる) ? [answer1]

(something) increases

2. What is the meaning of みつけた (みつける) ? [answer2]

found something (to find something)

Week 4 Day 1 Question 3 (same as Week 2 Day 1 Question 3)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of うつして (dictionary form: うつす) ? [answer1]

to shift something; to move something to a different place

2. What is the meaning of はずかしい (dictionary form: はずかしい) ? [answer2]

to be embarrassed

Week 4 Day 1 Question 4 (same as Week 2 Day 1 Question 4)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of あげる (Dictionary form: あげる) ? [answer1]

to raise something up high

2. What is the meaning of おろす (Dictionary form: おろす) ? [answer2]

to get something down

Week 4 Day 2 Question 1 (same questions as Week 2 Day 2 Question 1)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of へる (Dictionary form: へる) ? [answer1]

something decreases

2. What is the meaning of ふえた (ふえる) ? [answer2]

something increases

Week 4 Day 2 Question 2 (same questions as Week 2 Day 2 Question 2)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of のこって (のこる) ? [answer1]

something/someone remains in a location

2. What is the meaning of しゅうしょく ? [answer2]

to get employment

Week 4 Day 2 Question 3 (same questions as Week 2 Day 2 Question 3)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of にかて ? [answer1]

someone is not good at doing something

2. What is the meaning of アジサイ ? [answer2]

hydrangea (a kind of flower)

Week 4 Day 2 Question 4 (same questions as Week 2 Day 2 Question 4)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of かたづけた (かたづける) ? [answer1]

to put something away

2. What is the meaning of たおれます (たおれる) ? [answer2]

(something) falls down

Week 4 Day 3 Question 1 (same questions as Week 2 Day 3 Question 1)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of わかして (わかす) ? [answer1]

to boil water

2. What is the meaning of つけて (つける) ? [answer2]

to turn on (the light)

Week 4 Day 3 Question 2 (same questions as Week 2 Day 3 Question 2)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of わって (Dictionary form: わる) ? [answer1]

to crack (something)

2. What is the meaning of はいって (Dictionary form: はいる) ? [answer2]

to be inside, to enter

Week 4 Day 3 Question 3 (same questions as Week 2 Day 3 Question 3)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of おこして (Dictionary form: おこす) ? [answer1]

to wake someone up

2. What is the meaning of つづけよう (Dictionary form: つづける) ? [answer2]

to continue (something), Let's continue (something)

Week 4 Day 3 Question 4 (same questions as Week 2 Day 3 Question 4)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of なおした (Dictionary form: なおす) ? [answer1]

corrected (or to correct)

2. What is the meaning of まとめて (Dictionary form: まとめる) ? [answer2]

to put together

Week 4 Day 4 Question 1 (same questions as Week 2 Day 4 Question 1)

Please answer the questions.

If you cannot remember the meaning, please type 0.

Question 1

1. What is the meaning of とれました (Dictionary form: とれます) ? [answer1]

to come out; to come off

2. What is the meaning of おちた (Dictionary form: おちる) ? [answer2]

to fall

Week 4 Day 4 Question 2 (same questions as Week 2 Day 4 Question 2)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of さがっています (Dictionary form: さがる) ? [answer1]

to go lower

2. What is the meaning of だす ? [answer2]

to pay money for

Week 4 Day 4 Question 3 (same questions as Week 2 Day 4 Question 3)

Please answer the questions.

If you cannot remember the meaning, please type 0.

1. What is the meaning of のせる (のせる) ? [answer1]

to load up

2. What is the meaning of おわった (おわる) ? [answer2]

something finishes

Week 4 Day 4 Question 4 (same questions as Week 2 Day 4 Question 4)

Please answer the questions.

If you cannot remember the meaning, please type 0.

Question 4

1. What is the meaning of そうべつかい ? [answer1]

farewell party

2. What is the meaning of かんがえても (Dictionary form: かんがえる) ? [answer2]

to think about