**Appendix A**

*Target texts containing target items. The numbers at the beginning of each paragraph did not appear on the reading screens*.

**Target text 1 (Same condition):**

THE STORY OF HUGO

1 Hugo’s life started in a tiny village. One of the few buildings in the village was a glabe/droft for poor kids who had no money and nowhere to live. It was run by a very angry master and an old woman. They took in little kids knowing each would be a free worker for clerves/blagues until they became adults.

2 They treated every boy there like a brald/nuse who had been locked up for committing a serious offence. They should feel lucky to have a place to sleep and something to eat every day. Hugo was born early one morning. Nobody seemed to know who his mother was or where she came from.

3 People say that his mother arrived in the middle of the winter. The master heard a trobe/ralm outside and went to check what was happening. He saw a pregnant woman that looked very tired. She had lost all her strength. Her prinths/progues were dirty and her shoes were full of holes. He took her inside and Hugo was born.

4 His young mum was very ill. She took her salp/smurb off her finger and hung it from a string around her son’s neck. She died without showing any pain. The baby looked healthy and happy. He did not know about the life that was waiting for him. In a couple of clerves/blagues he would be a worker, like every other boy.

5 Hugo grew up in the glabe/droft with the other boys. It was not a very nice place to grow up in. But living alone in the outside pelch/nulb would be even harder. The boys never received any care and never had enough food. They had to work hard to have a place to sleep.

6 Every day they had the same routine. They had to wake up very early in the morning. The oldest boys would do the washing and the youngest would clean the rooms. At lunch, they always ate two culves/trieves of thin soup and no more. In the afternoon, the boys worked in the garden, picking vegetables to sell in the market.

7 After an afternoon of work in the garden, they only had a piece of bread for dinner. They were always told that there was no food for them, but they knew it was just sold in the village to make money. After the piece of bread, they had to go straight to sleep and not make any trobe/ralm or they would be punished.

8 One scooth/plerge Hugo had to stay up late after dinner to wash the dishes. When he was about to finish with the washing, he dropped some culves/trieves by accident. It woke everyone up. The master arrived in a second and started shouting. Everyone could hear him. They had never heard him so angry.

9 The boys watched through the blaunt/streen as the master angrily took Hugo to the punishment room at the end of the garden. None of the boys wanted to go there because it was very dark and full of rats. The boys thought Hugo would spend the whole scooth/plerge crying. He was not afraid because he always felt his mum protected him.   
  
10 The boys did not like this life, but they knew this was not their life forever. Every few months, foreign couples would come and choose a boy for adoption. Hugo’s dream was to be chosen by a very nice family. He held the salp/smurb from his mother and thought of the happy life to come.

11 If he ever wanted to leave that place, he had to behave properly. He promised not to create any more trouble. Otherwise, they would never let him go with a family into the outside pelch/nulb and start a new life. One morning, the master called Hugo. There was a couple who wanted to take him home. He was going to leave! He could not believe it!

12 He would not have to feel like a brald/nuse in that punishment room anymore. He would not be treated as a worker but as a real boy. He had to get ready to meet his new family. He was excited to be a normal boy with a mother and a father, like every other boy in the village. Life had finally brought him luck.

13 The following morning Hugo woke up. He looked through the blaunt/streen and saw was a nice-looking young man and woman outside. A few minutes later, the old woman called Hugo. He quickly ran downstairs. The couple were surprised to see the conditions in which the boys lived, but they looked extremely happy to see Hugo. They had a final conversation with the master and left.

14 When they arrived at his new place, the first thing the woman did was to throw away his prinths/progues and get new ones for him. They were so nice and smelled so good. He did not look like a poor worker anymore. They showed him his new room and things. The only thing he kept from his old life was the present from his mother.

15 A huge dinner was waiting for him. It was much better than the little food that he used to have every day. This was exactly as he had dreamt. He did not have to work anymore. He would not be punished. He would go to school. It would be a normal life. It was just like in his dreams.

16 Time moved on and he already felt part of the family. His new mother and father loved him. He did not miss the angry master. The only thing he missed from his old life was his friends. He thought about them every day. Maybe one day he would go back and visit them.

**Target texts 2-4 (Different condition)**

THE STORY OF THE MAGIC DRUM (Text 2)

1 Everyone in the village was hungry. The hot summer had dried all the food from the blagues/clerves and trees. Ajuji’s son, Tsin, was complaining. Ajuji’s wife stayed in droft/glabe all the time. She did not have any strength and she needed food. He was worried she might die. Ajuji told his son to go for a walk in the forest to find food.

2 Tsin walked through the forest and, suddenly, he fell into an opening in the ground. He landed hard at the bottom of the hole. He saw the hole was full of lights. In fact, it looked more like a plerge/scooth, with streets and buildings.

3 He started to walk along a nulb/pelch and shouted out to see if anyone was there. The place was cool and green and there was no sun to burn the blagues/clerves around him. He soon found an old woman sitting in a garden. He explained that his family had nothing to eat. She told him there was food in the garden.

4 The old woman told him to go there and ignore the potatoes that called out “Dig me up!”. She told him to only bring back the potatoes that said: “Don’t dig me up”. He did as he was told. In the garden he was very surprised that the potatoes were talking. He remembered the old woman’s progues/prinths clearly. He heard one quiet smurb/salp call out: "Don't pick me up!".

5 He picked it up and brought it back to the old lady. She told Tsin to boil the skin of the potato. The boy thought that this was very strange, but he did as he was told. He gave the boiled potato skin to the woman and she ate it. Then, she told the boy to return to the garden to find a drum.

6 The old woman told him to find a drum that sang sweetly. He ran to the back garden and past the potatoes. He soon found the drums. Again the boy did exactly as he was told and returned with a drum that was singing sweetly. The old lady smiled.

7 She told the boy to take this drum home and beat it every time he was hungry. The boy thanked the old lady and left. He placed the ralm/trobe from the old woman in the middle of his home with his hungry family waiting around him. He beat the drum and wonderful food appeared.

8 His family were amazed. They had not seen this much food in their lives. They didn’t wait and started to eat the food straight from the nuse/brald as it appeared. His mother was already looking stronger. Tsin wanted to share his amazing ralm/trobe with the whole village. He called everyone to the centre of the village and beat the drum once more.

9 Enough food for everyone appeared. The hungry people quickly started to eat the food. Young trieves/culves were singing, dancing and playing as everyone became stronger. Everyone thanked Tsin, he was a hero. Everyone was very happy except for one person - and that was Ajuji, who wanted the drum himself.

10 That evening Ajuji put his son to droft/glabe early. He asked where he got the drum. The boy told his father about the old lady who lived below the ground. The next morning Ajuji found the hole and jumped in. He was amazed by the plerge/scooth full of lights. He found the old woman sitting in a garden and demanded another drum.

11 The old lady told him to go into the garden and pick a potato that said ‘Don't pick me up!'. She told him that this was very important. Before she had finished talking, Ajuji was in the back garden. He was not listening to the old woman’s quiet smurb/salp as he did not really care.

12 Ajuji found the potatoes in the garden. Ignoring the woman’s clear progues/prinths, he grabbed two handfuls. He was not like his son. He thought he knew best. He brought the potatoes back to the old lady, and just as with his son, she told him to boil the skin of the potato and throw away the centre.

13 The man thought this was mad. He threw the skin on the nuse/brald and didn’t listen. When he boiled the centre of the potato it turned into a stone. He was amazed. He was going to tell this amazing streen/blaunt to everyone. The old lady ate the stone and said: "Now go back to the garden and find a drum, and be sure to choose the one that sings sweetly, not the one that bangs loudly.”

14 The man laughed. He told the lady that drums do not sing. He went to the garden and chose one with the loudest bang and climbed out of the hole with the drum. He ran back through the forest, along the nulb/pelch to the village. As his son had done before, he beat the drum but this time nothing appeared. He beat it again, even louder. Still no food.

15 Suddenly they heard a loud crash. Ajuji turned around and saw wild animals running out of the woods. No one had ever seen these animals before. The magic drum had called them onto the Earth. There were lions, wolves, snakes of all colours and scary dangerous looking animals running everywhere.

16 All the villagers ran away as fast as they could. Ajuji climbed a tall tree so the animals could not see him. He watched his family and trieves/culves run away from the village and the wild animals. He was left all alone. That is the streen/blaunt of how Ajuji was tricked by his own bad behaviour into bringing wild animals to the Earth.

THE STORY OF THE CATS (Text 3)

1) In a small plerge/scooth, a princess once lived in a huge castle with her cats until she was very old. The castle had over 100 cats. They had everything they needed. As the princess had no trieves/culves, she left all her money to the cats, but there was no one to look after them.

2) In the same village a nice young girl named Lizzy lived with her mother and sister, Maddy. They were both extremely mean to Lizzy, giving her progues/prinths to do all the cleaning and cooking. Lizzy was fed up with this. She had heard a streen/blaunt of a castle full of cats. So, she packed a little bag and left to find it.

3) She arrived at the castle and walked through the wild garden. She went inside and everywhere she looked there were cats! They were on the piano, the furniture, lying on the nuse/brald, and every step of the stairs. Lizzy climbed the stairs, being careful to avoid their tails. She carried on to the top of the castle.

4) She was surprised that this part was empty. There was a beautiful carpet and a large chair with a cat sleeping on it. Lizzy walked up to the cat and gently stroked it. When it awoke, it asked her to bring some cream. Lizzy saw a silver cup of cream and poured some into a gold plate.

5) She explained that she was looking for a place to live and she could cook and clean. The old cat agreed the castle needed a servant. He said she could make a droft/glabe downstairs to sleep. Every day she cleaned the entire place. She cleaned the nuse/brald and the furniture of cat hairs. She cared for the cats and they loved her.

6) After six months, the old cat gave Lizzy a 2-week holiday. He told her to open one of the boxes in the corner of the room which was full of gold coins. He told her to take just one piece of gold. She thanked her master and promised all the cats that she would be back soon.

7) As Lizzy ran down the nulb/pelch towards the bus stop she saw her sister and mother. She told them she was going on holiday with the ralm/trobe from the old cat. She explained he had a lot of money. Maddy and her mother were jealous. Maddy decided to go to the castle to take the old cat’s money.

8) Maddy went to the castle. She walked through the messy blagues/clerves in the garden and inside. She was disgusted to see cats crawling everywhere and it smelt horrible. She climbed the stairs until she found the old cat. He was asleep on the chair he used as a droft/glabe and Maddy rudely woke him up banging the cup of cream loudly on the side.

9) She announced in a loud smurb/salp that she wanted to marry him. The old cat agreed that if she did a better job looking after the castle than her sister, he would consider her proposal. Maddy saw the large boxes in the room. She wanted the money so she agreed with the old cat.

10) Downstairs, Maddy picked up the brush and pushed cats off the stairs and the tables. Maddy was very quick to start cleaning and giving progues/prinths to clear the cats from the furniture. She threw a bucket of water over the muddy cats. She cleared the mess and cat hairs and made many cats leave. Maddy now wanted the money.

11) After a week, she asked in a sweet smurb/salp if the cat had considered her proposal. He said he didn’t want to marry Maddy. Maddy was angry! She told the old cat that if he did not marry her, she would take some of his gold by force. The old cat did not like this and decided to get rid of Maddy.

12) The old cat whistled, and two large black and white cats appeared. The old cat told them to remove Maddy from the castle and make sure she never came back. Maddy wasn’t going to leave. She grabbed the pot of cream and threw it at the cats. A moment later, the cats jumped onto Maddy.

13) She tried to throw the cats off her, but they were biting and scratching wildly, and she had no choice but to run downstairs. The cats chased Maddy out of the castle. When she was further down the nulb/pelch, the kind-hearted Lizzy, who had returned early from her holiday, saw her sister running from the castle.

14) Maddy had a scratched face and arms. Lizzy was confused. When she arrived back at the castle she heard the streen/blaunt of Maddy’s behaviour. She went upstairs to apologise to the old cat. He told her how much the cats had missed her. He asked “How would you like to marry me? One day all this can be yours.”

15) Lizzy was not like her sister. She did not care about money. She said she was waiting to marry someone she loved. The old cat smiled. He could see that she was kind and honest. As a ralm/trobe, the old cat gave Lizzy the cottage at the end of the garden. She loved to live among the blagues/clerves and trees and was happy working for the cats.

16) A few months later Lizzy married a man who lived with her in the cottage. They had six trieves/culves and lived happily. Lizzy’s sister Maddy married a rich lawyer for his money and moved to a big, busy plerge/scooth that she hated. It was loud, and her husband was always busy. But there was one thing she hated more than anything else. She hated cats.

THE STORY OF GEORGE AND DAVID (Text 4)

1) A long time ago, the father of two young boys died suddenly and the elder brother, David, took all their father’s riches. David lived comfortably, with lots of money. His younger brother, George, was very poor. He lived in a small cottage. He had to sleep on the nuse/brald as he had no furniture.

2) George had several trieves/culves and a lovely wife who made and sold shoes. Sometimes, they earned enough to buy food, but sometimes, they went hungry. George went to the local plerge/scooth to look for work. While he was away, his wife asked one of her sons to ask his rich uncle David for food.

3) As the boy walked down the nulb/pelch to his uncle’s place he saw cows, pigs and chickens. He found his uncle David and asked if he could share some rice. David refused. He said he was not going to give the boy any food. The boy ran home crying with empty hands.

4) When his mother saw him crying, she knew he didn’t have any food. The trieves/culves all cried with hunger. The next day, George returned with a new job on a farm. Spring came and many birds arrived and made nests under their roof. George and his family fed the baby birds and soon the birds trusted the family.

5) One day, George saw a snake near the birds. He warned the birds. One bird caught his leg in the roof trying to fly away. George quickly saved the bird. He laid the little bird in a warm droft/glabe and the bird soon began to get stronger and could fly again.

6) Autumn came and one evening the family heard the sweet smurb/salp of the bird with the broken leg. He was singing on the fence. All the birds then flew off before the cold winter. When they arrived back home, they lined up before the King of the Birds. The King saw the little bird with one bent leg, and he asked him what had happened.

7) The bird explained the streen/blaunt of the snake and his trapped leg. He said a poor man had taken care of him until his leg was better. The King gave the little bird progues/prinths to take a seed with beautiful gold letters to the man. One day in spring, the family heard a familiar bird song and saw their little bird with something in his mouth.

8) The bird dropped the seed and flew away. George saw the mysterious gold letters. He planted the seed in his garden and gave it plenty of water. In four days, a few green shoots appeared and soon the blagues/clerves were climbing up the wall of his cottage. Four fruits started to grow.

9) The fruit became huge. George climbed up and cut them down before they broke the roof. Then he cut open the first. It was hard work, but when the sides of the huge fruit fell apart, out stepped two boys carrying bottles of fine wine. George was surprised. He called his wife, who was as amazed as he was.

10) “The King of the Birds has told us to bring you a ralm/trobe to thank you for your kindness.” George was extremely curious. In the second fruit he found warm coats and food. From the third, three men jumped out and started to build a new home. In the final fruit, he discovered enough gold to make them the richest people in the plerge/scooth where they lived.

11) It was not long before George’s rich brother heard of his brother’s good fortune. David decided to visit the family. George told him the whole streen/blaunt of the bird with the broken leg and the amazing fruit. On his way home, David could not stop thinking about his brother’s luck, and decided to get the magical fruit himself.

12) When David arrived home, he gave progues/prinths to his gardener to catch a bird and break its leg. Then he ordered his servant to fix the broken leg. When the bird was better, he flew home and he told the King of the Birds what had happened. The King gave him a magical seed and told him to present it as a ralm/trobe to David in the spring.

13) Spring came and the bird brought the seed to David. David planted it in his garden. The blagues/clerves grew up the walls of his cottage. The fruit grew under the roof and moved it so that the rain poured onto David’s droft/glabe when he was asleep. He did not care. He knew that the fruit would bring money and he had much more fruit than his brother.

14) When it was time, David started to open the fruit. In the first fruit was a group of dancers. They started to play loud music, banging loud drums and dancing around David. His pigs and cows started to run away down the nulb/pelch because they were scared. David asked the dancers to leave but they did not.

15) Suddenly, the other fruits started to open. There was one full of animals that destroyed his cottage. A group of singers appeared, each singing in a smurb/salp louder than the last. Screaming babies; arguing couples; ugly women asking to marry David and a strong man who threw him across the nuse/brald all appeared.

16) When the final fruit fell apart, a terrible storm blew around the farm, pulling down the buildings and blowing his servants and animals away. David’s riches were ruined. He had no choice but to ask his younger brother for help. David moved into a small cottage on George’s farm, and never again did he wish for more than his brother.

**APPENDIX B**

**Pseudoword characteristics:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Pseudoword** | **Letters** | **Syllables** | **English-like form Rating** |
| Glabe | 5 | 1 | 5 |
| Brald | 5 | 1 | 4 |
| Trobe | 5 | 1 | 4 |
| Prinths | 7 | 1 | 4 |
| Salp | 4 | 1 | 4 |
| Culves | 6 | 1 | 4 |
| Scooth | 6 | 1 | 4 |
| Clerves | 7 | 1 | 4 |
| Pelch | 5 | 1 | 4 |
| Blaunt | 6 | 1 | 5 |
| Nuse | 4 | 1 | 5 |
| Blagues | 7 | 1 | 4 |
| Smurb | 5 | 1 | 4 |
| Progues | 7 | 1 | 4 |
| Droft | 5 | 1 | 4 |
| Ralm | 4 | 1 | 4 |
| Plerge | 6 | 1 | 4 |
| Nulb | 4 | 1 | 4 |
| Trieves | 7 | 1 | 4 |
| Streen | 6 | 1 | 4 |

**Appendix C**

**Pseudoword target meanings and encounters:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Pseudoword** | **Original word** | **Frequency** | **Encounter** | **Condition** |
| Glabe | house | 1K | Text 1 | Same |
| bed | 1k | Text 2-4 | Different |
| Brald | criminal | 2K | Text 1 | Same |
| floor | 1k | Text 2-4 | Different |
| Trobe | noise | 1K | Text 1 | Same |
| gift | 2k | Text 2-4 | Different |
| Prinths | clothes | 1k | Text 1 | Same |
| orders | 1k | Text 2-4 | Different |
| Salp | ring | 1k | Text 1 | Same |
| voice | 1k | Text 2-4 | Different |
| Culves | bowls | 2k | Text 1 | Same |
| children | 1k | Text 2-4 | Different |
| Scooth | night | 1k | Text 1 | Same |
| town | 1k | Text 2-4 | Different |
| Clerves | years | 1k | Text 1 | Same |
| plants | 1k | Text 2-4 | Different |
| Pelch | world | 1k | Text 1 | Same |
| road | 1k | Text 2-4 | Different |
| Blaunt | window | 1k | Text 1 | Same |
| story | 1k | Text 2-4 | Different |
| Nuse | floor | 1k | Text 2-4 | Different |
| criminal | 2K | Text 1 | Same |
| Blagues | plants | 1k | Text 2-4 | Different |
| years | 1k | Text 1 | Same |
| Smurb | voice | 1k | Text 2-4 | Different |
| ring | 1k | Text 1 | Same |
| Progues | orders | 1k | Text 2-4 | Different |
| clothes | 1k | Text 1 | Same |
| Droft | bed | 1k | Text 2-4 | Different |
| house | 1K | Text 1 | Same |
| Ralm | gift | 2k | Text 2-4 | Different |
| noise | 1K | Text 1 | Same |
| Plerge | town | 1k | Text 2-4 | Different |
| night | 1k | Text 1 | Same |
| Nulb | road | 1k | Text 2-4 | Different |
| world | 1k | Text 1 | Same |
| Trieves | children | 1k | Text 2-4 | Different |
| bowl | 2k | Text 1 | Same |
| Streen | story | 1k | Text 2-4 | Different |
| window | 1k | Text 1 | Same |

**Appendix D**

**Detail of experimental study design**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Session 1 | | Session 2 | | Session 3 |
|  | **Treatment** | **Post-test(s)** | **Treatment** | **Post-test(s)** | **Post-test(s)** |
| Group 1a (Same first) | Text 1 x 3 (Set1) | True/False Comprehension | Texts 2-4 (Set2) | T/F Comp  V\_YN  LLAMA B\*  Form recognition  Meaning recognition (Set2) | Form recognition  Meaning recognition (Set1)  Quick OPT |
| Group 1b (Diff first) | Texts 2-4 (Set2) | True/False Comprehension | Text 1 x 3 (Set1) | T/F Comp  V\_YN  LLAMA B  Form recognition  Meaning recognition (Set1) | Form recognition  Meaning recognition (Set2\_M1  Quick OPT |
| Group 2a (Same first) | Text 1 x 3 (Set2) | True/False Comprehension | Texts 2-4 (Set1) | T/F Comp  V\_YN  LLAMA B  Form recognition  Meaning recognition (Set1) | Form recognition  Meaning recognition (Set2)  Quick OPT |
| Group 2b (Diff first) | Texts 2-4 (Set1) | True/False Comprehension | Text 1 x 3 (Set2) | T/F Comp  V\_YN  LLAMA B  Form recognition  Meaning recognition (Set21) | Form recognition  Meaning recognition (Set1)  Quick OPT |

**\*Note:** the Llama B was included as part of a different study within a larger project, and the results will be

reported elsewhere.

**Appendix E**

**List of distractor pseudowords**

|  |  |  |  |
| --- | --- | --- | --- |
| **Pseudoword distractor** | **Letters** | **Syllables** | **English-like form Rating** |
| yode | 4 | 1 | 5 |
| dince | 5 | 1 | 5 |
| fraws | 5 | 1 | 4 |
| blase | 5 | 1 | 5 |
| clafts | 6 | 1 | 4 |
| smait | 5 | 1 | 4 |
| scretes | 7 | 1 | 4 |
| gerths | 6 | 1 | 5 |
| whirp | 5 | 1 | 5 |
| churts | 6 | 1 | 5 |
| druct | 5 | 1 | 4 |
| drene | 7 | 1 | 5 |
| yilk | 4 | 1 | 4 |
| plute | 5 | 1 | 4 |
| dird | 4 | 1 | 4 |
| jext | 4 | 1 | 4 |
| twiege | 6 | 1 | 4 |
| flarsh | 6 | 1 | 4 |
| sproaks | 7 | 1 | 4 |
| norb | 4 | 1 | 4 |

**Appendix F**

**Vocabulary Tests**

***Form Recognition***

**Set 1**

*From the following list, please choose the words that appeared in the text.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| brald | pelch | clafts | flerge | salp |
| twiege | blase | glabe | prinths | norb |
| scooth | scretes | clerves | bratch | flarsh |
| thrubs | trobe | sproaks | culves | blaunt |

**Set 2**

*From the following list, please choose the words that appeared in the texts.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| dince | blagues | yode | nulb | gerths |
| fraws | whirp | streen | smurb | plerge |
| nuse | droft | prouges | churts | cluft |
| trieves | smait | drene | ralm | yilk |

***Meaning Recognition***

*Please select one of the following definitions. Only one is correct.  If you don’t know the meaning of the word, please select option d) “I don’t know”.*

**Text 1**

1) glabe /droft

            a) market

            b) prison

            c) house

            d) I don’t know.

2) brald / nuse

            a) adult

            b) criminal

            c) judge

            d) I don’t know.

3) trobe / ralm

            a) noise

            b) rhythm

            c) pain

            d) I don’t know.

4) prinths / progues

             a) dishes

             b) blankets

             c) clothes

             d) I don’t know.

5) salp / smurb

            a) lunch

            b) ring

            c) chain

            d) I don’t know

6) culves / trieves

            a) rooms

            b) bowls

            c) forks

            d) I don’t know

7) scooth / plerge

            a) neck

            b) moon

            c) night

            d) I don’t know.

8) clerves / blagues

            a) routines

            b) minutes

            c) years

            d) I don’t know

9) pelch / nulb

           a) place

            b) sky

            c) world

            d) I don’t know

10) blaunt / streen

            a) string

            b) window

            c) wall

            d) I don’t know

**Texts 2-4**

*Please select one of the following definitions. Only one is correct.  If you don’t know the meaning of the word, please select option e) “I don’t know”.*

1) nuse / brald

            a) village

            b) floor

            c) ceiling

            d) I don’t know.

2) blagues / clerves

            a) plants

            b) stairs

            c) roots

            d) I don’t know.

3) smurb / salp

            a) water

            b) tune

            c) voice

            d) I don’t know.

4) progues / prinths

             a) laws

             b) orders

             c) letters

             e) I don’t know.

5) droft / glabe

            a) coin

            b) bed

            c) pillow

            d) I don’t know

6) ralm / trobe

            a) face

            b) gift

            c) flower

            d) I don’t know

7) plerge / scooth

            a) bucket

            b) town

            c) hall

            d) I don’t know.

8) nulb / pelch

            a) road

            b) bridge

            c) brush

            d) I don’t know

9) trieves / culves

            a) hands

            b) children

            c) people

            d) I don’t know

10) streen / blaunt

            a) fairytale

            b) chair

            c) story

            d) I don’t know

**Appendix G**

**Comprehension Questions**

**Text 1**

*Read each statement carefully and answer TRUE or FALSE or I don’t know.*

1. Hugo's life started in a big city.
2. The master expected the boys to feel lucky to live there and work for free.
3. Hugo was born on the street, where he was found by the master.
4. Hugo’s mother gave the master a present to give Hugo when he was older.
5. Living on the street would have been easier for the boys than living with the master.
6. The oldest boys did the washing and the youngest cleaned the rooms.
7. The boys were only given a piece of bread for dinner.
8. Hugo woke everyone up because he screamed in his sleep.
9. Hugo was not scared of the rats because he felt that his mother protected him.
10. The boys knew that if they were lucky, they would be adopted by a foreign couple.
11. Hugo decided to behave badly so the master would give him for adoption soon.
12. Hugo was happy to be adopted because he would not have to work anymore.
13. The couple were pleased to see Hugo but shocked to see the conditions in the home.
14. The woman threw away all of Hugo’s old things, including his mother’s present.
15. Hugo’s new life was very different from what he had dreamt it would be.
16. Hugo missed his old friends and thought that maybe he could go back to see them.

**Text 2**

*Read each statement carefully and answer TRUE or FALSE or I don’t know.*

1. Ajuji’s wife was sick and needed special food to save her.
2. In the middle of the forest, Tsin fell into a hole full of trees and buildings.
3. The place that Tsin found was very hot and sunny.
4. The old woman told Tsin to ignore the potatoes that said “Don’t dig me up!”
5. Tsin boiled only the potato skin and the old woman ate it.
6. When Tsin went to look for the drum he picked up some more potatoes.
7. When Tsin beat his drum lots of animals appeared, bringing plates of food.
8. Tsin took the magic drum to the village centre and beat it once more.
9. Ajuji was the only person in the village who was not happy about the drum.
10. Tsin did not want to tell Ajuji how he had found the magic drum.
11. Ajuji ran into the back garden while the old woman was still talking to him.
12. Ajuji brought the woman more than one potato because he thought he knew best.
13. Ajuji boiled the skins of all the potatoes but they turned into stones.
14. Ajuji thought that drums do not sing, so he chose one with a loud bang.
15. When Ajuji beat the drum many scary and dangerous animals ran into the village.
16. Ajuji and his family had to hide up a tree to escape the wild animals.

**Text 3**

*Read each statement carefully and answer TRUE or FALSE or I don’t know.*

1. When the princess died she hid all her money in a box.
2. Lizzy was tired of working like a servant for her mother and Maddy.
3. There were cats on every step of the stairs.
4. Lizzy found an old cat sleeping on a beautiful carpet next to a cup of cream.
5. The old cat told Lizzy that if she cleaned the castle well she could marry him.
6. The cat told Lizzy to take as many gold coins as she wanted from the box.
7. Maddy decided to try to get the old cat’s gold for herself while Lizzy was away.
8. Maddy woke up the old cat by throwing the pot of cream at him.
9. The old cat said he might marry Maddy if she looked after the castle better than Lizzy.
10. Maddy threw water over some cats to clean the mud off them.
11. Maddy threatened to take the old cat’s gold by force because he wouldn’t marry her.
12. Maddy didn’t want to leave the castle because she liked living there.
13. The old cat attacked Maddy and chased her out of the castle.
14. The old cat told Lizzy she could marry him and have all his riches.
15. The old cat gave Lizzy a cottage.
16. Maddy married a lawyer but he was poor.

**Text 4**

*Read each statement carefully and answer TRUE or FALSE or I don’t know.*

1. When George and David’s father died, he decided not to leave anything to George.
2. George’s wife made shoes and sold them.
3. David sent his nephew home with only one plate of rice.
4. George and his family fed the birds nesting under their roof.
5. George saved a bird that had got its leg stuck in a snake’s mouth.
6. Every autumn the birds left their nests and went to see their King.
7. The bird with a bent leg brought George a seed with gold letters on it.
8. The seed grew into a big tree that broke George’s roof.
9. The first fruit contained two boys holding bottles of fine wine.
10. Another fruit contained builders who made George a new home.
11. When David heard about his brother’s fortune, he decided to steal the magic fruit.
12. David broke a bird’s leg and then he fixed it.
13. David was upset when he discovered the fruit had moved the roof.
14. David’s farm animals were frightened away by noisy musicians and dancers.
15. Another fruit contained children arguing with their parents.
16. A terrible storm destroyed David’s farm and ruined all his riches.

**Appendix H**

Normality scores for dependent measures (after removing outliers)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Measure | Skewness | | Kurtosis | |
| Statistic | SE | Statistic | SE |
| TFD | 0.847 | 0.036 | 0.432 | 0.071 |
| AFD | -0.375 | 0.036 | 0.293 | 0.071 |
| FFD | 0.035 | 0.036 | 0.33 | 0.071 |
| FC | 0.736 | 0.036 | 0.217 | 0.071 |
| Form Recogn. | -0.157 | 0.034 | -1.976 | 0.69 |
| Meaning Recogn. | 0.569 | 0.034 | 0.122 | 0.69 |
| Meaning Recall | 2.319 | 0.034 | 3.378 | 0.69 |

**Appendix I**

Results for RQ1: LMMs.

**I1. Total Fixation Duration (TFD)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter Estimates TFD** | | | | | | |
|  | B | Std. Error | t | Sig. | 95% Confidence Interval | |
| Lower | Upper |
| Intercept | 379.749 | 9.780 | 38.831 | 0.000 | 360.576 | 398.921 |
| Condition (Same) | -34.522 | 13.783 | -2.505 | 0.012 | -61.543 | -7.500 |
| Reading Time (1) | 110.652 | 14.949 | 7.402 | 0.000 | 81.345 | 139.959 |
| Reading Time (2) | 20.760 | 14.063 | 1.476 | 0.140 | -6.810 | 48.330 |
| Reading Time (1)\*Condition (Same) | 48.152 | 21.141 | 2.278 | 0.023 | 6.705 | 89.598 |
| Reading Time (2)\*Condition (Same) | -0.046 | 19.858 | -0.002 | 0.998 | -38.977 | 38.886 |
| Reference categories in parentheses. Only coefficients different from 0 are included in the table. | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Contrasts TFD (Condition)** | | | | | | | |  |
|  | Contrast Estimate | Std. Error | t | df | Adj. Sig. | 95% Confidence Interval | |  |
| Lower | Upper |  |
| Same - Different | -18.486 | 8.507 | -2.173 | 4882 | 0.030 | -35.164 | -1.808 |  |
| The sequential Bonferroni adjusted significance level is .05. Confidence interval bounds are approximate. | | | | | | | |  |
|  |  |  |  |  |  |  |  |  |
| **Pairwise Contrasts TFD (Reading Times)** | | | | | | | |  |
|  | Contrast Estimate | Std. Error | t | df | Adj. Sig. | 95% Confidence Interval | |  |
| Lower | Upper |  |
| 1 - 2 | 113.991 | 10.740 | 10.614 | 4882 | 0.000 | 88.272 | 139.711 |  |
| 1 - 3 | 134.728 | 10.571 | 12.745 | 4882 | 0.000 | 111.028 | 158.429 |  |
| 2 - 3 | 20.737 | 9.929 | 2.088 | 4882 | 0.037 | 1.271 | 40.203 |  |
| The sequential Bonferroni adjusted significance level is .05. Confidence interval bounds are approximate. | | | | | | | |  |
|  |  |  |  |  |  |  |  |  |
| **Pairwise Contrasts TFD (Reading Times\*Condition)** | | | | | | | | |
| Condition | | Contrast Estimate | Std. Error | t | df | Adj. Sig. | 95% Confidence Interval | |
| Lower | Upper |
| Same | 1 - 2 | 138.090 | 15.212 | 9.078 | 4882 | 0.000 | 101.660 | 174.519 |
| 1 - 3 | 158.804 | 14.949 | 10.623 | 4882 | 0.000 | 125.286 | 192.322 |
| 2 - 3 | 20.714 | 14.021 | 1.477 | 4882 | 0.140 | -6.773 | 48.202 |
| Different | 1 - 2 | 89.892 | 15.165 | 5.928 | 4882 | 0.000 | 55.892 | 123.893 |
| 1 - 3 | 110.652 | 14.949 | 7.402 | 4882 | 0.000 | 74.852 | 146.453 |
| 2 - 3 | 20.760 | 14.063 | 1.476 | 4882 | 0.140 | -6.810 | 48.330 |
| The sequential Bonferroni adjusted significance level is .05. Confidence interval bounds are approximate. | | | | | | | | |
|  |  |  |  |  |  |  |  |  |
| **Pairwise Contrasts TFD (Condition\*Reading Time)** | | | | | | | | |
| Reading Time | | Contrast Estimate | Std. Error | t | df | Adj. Sig. | 95% Confidence Interval | |
| Lower | Upper |
| 1 | Same - Different | 13.630 | 16.031 | 0.850 | 4882 | 0.395 | -17.797 | 45.058 |
| 2 | Same - Different | -34.567 | 14.296 | -2.418 | 4882 | 0.016 | -62.594 | -6.540 |
| 3 | Same - Different | -34.522 | 13.783 | -2.505 | 4882 | 0.012 | -61.543 | -7.500 |
| The sequential Bonferroni adjusted significance level is .05. Confidence interval bounds are approximate. | | | | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimated Means TFD (Reading Time\*Condition)** | | | | | |
| Reading Time | | Mean | Std. Error | 95% Confidence Interval | |
| Lower | Upper |
| 1 | Same | 504.031 | 11.364 | 481.752 | 526.310 |
| Different | 490.401 | 11.307 | 468.235 | 512.567 |
| 2 | Same | 365.941 | 10.112 | 346.117 | 385.766 |
| Different | 400.509 | 10.106 | 380.697 | 420.320 |
| 3 | Same | 345.227 | 9.713 | 326.186 | 364.268 |
| Different | 379.749 | 9.780 | 360.576 | 398.921 |

**I2. Average Fixation Duration (AFD)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter Estimates AFD** | | | | | | | | | | | | | | | |
|  | | | | B | | Std. Error | | t | | Sig. | | 95% Confidence Interval | | | |
| Lower | | Upper | |
| Intercept | | | | 187.082 | | 3.446 | | 54.297 | | 0.000 | | 180.327 | | 193.837 | |
| Condition (Same) | | | | -9.503 | | 4.862 | | -1.955 | | 0.051 | | -19.034 | | 0.028 | |
| Reading Time (1) | | | | 28.030 | | 4.545 | | 6.167 | | 0.000 | | 19.120 | | 36.940 | |
| Reading Time (2) | | | | 16.684 | | 4.671 | | 3.572 | | 0.000 | | 7.527 | | 25.841 | |
| Reading Time (1)\*Condition (Same) | | | | 8.558 | | 6.423 | | 1.332 | | 0.183 | | -4.034 | | 21.150 | |
| Reading Time (2)\*Condition (Same) | | | | -11.415 | | 6.586 | | -1.733 | | 0.083 | | -24.326 | | 1.496 | |
| Reference categories in parentheses. Only coefficients different from 0 are included in the table | | | | | | | | | | | | | | | |
| **Pairwise Contrasts AFD (Reading Times)** | | | | | | | | | | | | |  | |
|  | Contrast Estimate | Std. Error | t | | df | | Adj. Sig. | | 95% Confidence Interval | | | |  | |
| Lower | | Upper | |  | |
| 1 - 2 | 21.332 | 3.056 | 6.981 | | 4960 | | 0.000 | | 14.481 | | 28.184 | |  | |
| 1 - 3 | 32.309 | 3.211 | 10.060 | | 4960 | | 0.000 | | 24.618 | | 40.000 | |  | |
| 2 - 3 | 10.977 | 3.293 | 3.333 | | 4960 | | 0.001 | | 4.521 | | 17.432 | |  | |
| The sequential Bonferroni adjusted significance level is .05. Confidence interval bounds are approximate. | | | | | | | | | | | | |  | |
|  |  |  |  | |  | |  | |  | |  | |  | |
| **Pairwise Contrasts AFD (Reading Time\*Condition)** | | | | | | | | | | | | | | |
| Condition | | Contrast Estimate | Std. Error | | t | | df | | Adj. Sig. | | 95% Confidence Interval | | | |
| Lower | | Upper | |
| Same | 1 - 2 | 31.319 | 4.316 | | 7.257 | | 4960 | | 0.000 | | 21.643 | | 40.995 | |
| 1 - 3 | 36.588 | 4.539 | | 8.062 | | 4960 | | 0.000 | | 25.719 | | 47.457 | |
| 2 - 3 | 5.269 | 4.643 | | 1.135 | | 4960 | | 0.256 | | -3.833 | | 14.371 | |
| Different | 1 - 2 | 11.346 | 4.328 | | 2.622 | | 4960 | | 0.009 | | 2.862 | | 19.830 | |
| 1 - 3 | 28.030 | 4.545 | | 6.167 | | 4960 | | 0.000 | | 17.146 | | 38.914 | |
| 2 - 3 | 16.684 | 4.671 | | 3.572 | | 4960 | | 0.001 | | 6.212 | | 27.156 | |
| The sequential Bonferroni adjusted significance level is .05. Confidence interval bounds are approximate. | | | | | | | | | | | | | | |
|  |  |  |  | |  | |  | |  | |  | |  | |
| **Pairwise Contrasts AFD (Condition\*Reading Time)** | | | | | | | | | | | | | | |
| Reading Time | | Contrast Estimate | Std. Error | | t | | df | | Adj. Sig. | | 95% Confidence Interval | | | |
| Lower | | Upper | |
| 1 | Same - Different | -0.945 | 4.197 | | -0.225 | | 4960 | | 0.822 | | -9.174 | | 7.284 | |
| 2 | Same - Different | -20.918 | 4.442 | | -4.709 | | 4960 | | 2.561E-06 | | -29.627 | | -12.209 | |
| 3 | Same - Different | -9.503 | 4.862 | | -1.955 | | 4960 | | 0.051 | | -19.034 | | 0.028 | |
| The sequential Bonferroni adjusted significance level is .05. Confidence interval bounds are approximate. | | | | | | | | | | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimated Means AFD (Reading Time\*Condition)** | | | | | |
| Reading Time | | Mean | Std. Error | 95% Confidence Interval | |
| Lower | Upper |
| 1 | Same | 214.167 | 2.972 | 208.340 | 219.994 |
| Different | 215.112 | 2.964 | 209.301 | 220.922 |
| 2 | Same | 182.848 | 3.129 | 176.714 | 188.982 |
| Different | 203.766 | 3.153 | 197.584 | 209.948 |
| 3 | Same | 177.579 | 3.430 | 170.855 | 184.303 |
| Different | 187.082 | 3.446 | 180.327 | 193.837 |

**I3. Fixation Duration (FFD)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter Estimates FFD** | | | | | | | | | | | | | |
|  | | | | Coefficient | | Std. Error | | t | | Sig. | 95% Confidence Interval | | | |
| Lower | | Upper | |
| Intercept | | | | 184.384 | | 3.752 | | 49.141 | | 0.000 | 177.028 | | 191.740 | |
| Condition (Same) | | | | -7.399 | | 5.297 | | -1.397 | | 0.163 | -17.784 | | 2.986 | |
| Reading Time (1) | | | | 24.488 | | 5.071 | | 4.829 | | 0.000 | 14.547 | | 34.430 | |
| Reading Time (2) | | | | 15.090 | | 5.160 | | 2.924 | | 0.003 | 4.974 | | 25.207 | |
| Reading Time (1)\*Condition (Same) | | | | 1.348 | | 7.157 | | 0.188 | | 0.851 | -12.683 | | 15.380 | |
| Reading Time (2)\*Condition (Same) | | | | -10.271 | | 7.278 | | -1.411 | | 0.158 | -24.539 | | 3.998 | |
| Reference categories in parentheses. Only coefficients different from 0 are included in the table. | | | | | | | | | | | | | | |
| **Pairwise Contrasts FFD (Condition)** | | | | | | | | | | | | | |
|  | Contrast Estimate | Std. Error | t | | df | | Adj. Sig. | | 95% Confidence Interval | | | | |
| Lower | | | Upper | |
| Same - Different | -10.373 | 2.909 | -3.566 | | 4935 | | 0.000 | | -16.075 | | | -4.670 | |
| The sequential Bonferroni adjusted significance level is .05. Confidence interval bounds are approximate. | | | | | | | | | | | | | |
|  |  |  |  | |  | |  | |  | | |  | |
| **Pairwise Contrasts FFD (Reading Times)** | | | | | | | | | | | | | |
|  | Contrast Estimate | Std. Error | t | | df | | Adj. Sig. | | 95% Confidence Interval | | | | |
| Lower | | | Upper | |
| 1 - 2 | 15.207 | 3.467 | 4.386 | | 4935 | | 0.000 | | 7.434 | | | 22.981 | |
| 1 - 3 | 25.162 | 3.579 | 7.031 | | 4935 | | 0.000 | | 16.592 | | | 33.733 | |
| 2 - 3 | 9.955 | 3.639 | 2.736 | | 4935 | | 0.006 | | 2.821 | | | 17.089 | |
| The sequential Bonferroni adjusted significance level is .05. Confidence interval bounds are approximate. | | | | | | | | | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimated Means FFD (Reading Time\*Condition)** | | | | | |
| Reading Time | | Mean | Std. Error | 95% Confidence Interval | |
| Lower | Upper |
| 1 | Same | 202.822 | 3.396 | 196.165 | 209.479 |
| Different | 208.872 | 3.411 | 202.184 | 215.559 |
| 2 | Same | 181.805 | 3.516 | 174.912 | 188.697 |
| Different | 199.474 | 3.543 | 192.528 | 206.420 |
| 3 | Same | 176.985 | 3.739 | 169.654 | 184.316 |
| Different | 184.384 | 3.752 | 177.028 | 191.740 |

**I4. Fixation Count (FC)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter Estimates FC** | | | | | | |
| Model Term | B | Std. Error | t | Sig. | 95% Confidence Interval | |
| Lower | Upper |
| Intercept | 1.817 | 0.045 | 40.602 | 0.000 | 1.729 | 1.904 |
| Condition (Same) | -0.184 | 0.063 | -2.922 | 0.003 | -0.308 | -0.061 |
| Reading Time (1) | 0.423 | 0.067 | 6.298 | 0.000 | 0.291 | 0.554 |
| Reading Time (2) | 0.081 | 0.063 | 1.280 | 0.201 | -0.043 | 0.204 |
| Reading Time (1)\*Condition (Same) | 0.256 | 0.095 | 2.694 | 0.007 | 0.070 | 0.442 |
| Reading Time (2)\*Condition (Same) | 0.024 | 0.089 | 0.268 | 0.789 | -0.151 | 0.199 |
| Reference categories in parentheses. Only coefficients different from 0 are included in the table. | | | | | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Contrasts FC (Condition)** | | | | | | | | | | | | |  |
|  | | Contrast Estimate | | Std. Error | | t | | df | | Adj. Sig. | 95% Confidence Interval | |  |
| Lower | Upper |  |
| Same - Different | | -0.091 | | 0.038 | | -2.394 | | 4904 | | 0.017 | -0.166 | -0.017 |  |
| The sequential Bonferroni adjusted significance level is .05. Confidence interval bounds are approximate. | | | | | | | | | | | | |  |
|  | |  | |  | |  | |  | |  |  |  |  |
| **Pairwise Contrasts FC (Reading Times)** | | | | | | | | | | | | |  |
|  | | Contrast Estimate | | Std. Error | | t | | df | | Adj. Sig. | 95% Confidence Interval | |  |
| Lower | Upper |  |
| 1 - 2 | | 0.458 | | 0.048 | | 9.634 | | 4904 | | 0.000 | 0.344 | 0.572 |  |
| 1 - 3 | | 0.551 | | 0.047 | | 11.598 | | 4904 | | 0.000 | 0.444 | 0.657 |  |
| 2 - 3 | | 0.093 | | 0.045 | | 2.076 | | 4904 | | 0.038 | 0.005 | 0.180 |  |
| The sequential Bonferroni adjusted significance level is .05. Confidence interval bounds are approximate. | | | | | | | | | | | | |  |
|  | |  | |  | |  | |  | |  |  |  |  |
| **Pairwise Contrasts FC (Reading Times\*Condition)** | | | | | | | | | | | | | |
| Condition | | | | Contrast Estimate | | Std. Error | | t | | df | Adj. Sig. | 95% Confidence Interval | |
| Lower | Upper |
| Same | | 1 - 2 | | 0.574 | | 0.067 | | 8.504 | | 4904 | 0.000 | 0.412 | 0.736 |
| 1 - 3 | | 0.679 | | 0.067 | | 10.103 | | 4904 | 0.000 | 0.528 | 0.829 |
| 2 - 3 | | 0.105 | | 0.063 | | 1.656 | | 4904 | 0.098 | -0.019 | 0.229 |
| Different | | 1 - 2 | | 0.342 | | 0.067 | | 5.108 | | 4904 | 0.000 | 0.192 | 0.492 |
| 1 - 3 | | 0.423 | | 0.067 | | 6.298 | | 4904 | 0.000 | 0.262 | 0.584 |
| 2 - 3 | | 0.081 | | 0.063 | | 1.280 | | 4904 | 0.201 | -0.043 | 0.204 |
| The sequential Bonferroni adjusted significance level is .05. Confidence interval bounds are approximate. | | | | | | | | | | | | | |
|  | |  | |  | |  | |  | |  |  |  |  |
| **Pairwise Contrasts FC (Condition\*Reading Time)** | | | | | | | | | | | | | |
| Reading Time | | | | Contrast Estimate | | Std. Error | | t | | df | Adj. Sig. | 95% Confidence Interval | |
| Lower | Upper |
| 1 | | Same - Different | | 0.071 | | 0.071 | | 1.007 | | 4904 | 0.314 | -0.068 | 0.211 |
| 2 | | Same - Different | | -0.160 | | 0.063 | | -2.537 | | 4904 | 0.011 | -0.284 | -0.036 |
| 3 | | Same - Different | | -0.184 | | 0.063 | | -2.922 | | 4904 | 0.003 | -0.308 | -0.061 |
| The sequential Bonferroni adjusted significance level is .05. Confidence interval bounds are approximate. | | | | | | | | | | | | | |
| **Estimated Means FC (Reading Time\*Condition)** | | | | | | | | | | |
| Reading Time | | | Mean | | Std. Error | | 95% Confidence Interval | | | |
| Lower | | Upper | |
| 1 | Same | | 2.311 | | 0.050 | | 2.212 | | 2.410 | |
| Different | | 2.239 | | 0.050 | | 2.141 | | 2.338 | |
| 2 | Same | | 1.737 | | 0.045 | | 1.649 | | 1.825 | |
| Different | | 1.897 | | 0.044 | | 1.810 | | 1.985 | |
| 3 | Same | | 1.632 | | 0.044 | | 1.545 | | 1.719 | |
| Different | | 1.817 | | 0.045 | | 1.729 | | 1.904 | |

**Appendix J**

Results for RQ2. GLMMs.

**J1. Form Recognition**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter Estimates (Form Recognition)** | | | | | | | | | | | | |
|  | | | | B | | Std. Error | | t | | Sig. | 95% Confidence Interval | | | Exp(Coefficient) | 95% Confidence Interval for Exp(Coefficient) | |
| Lower | Upper | | Lower | Upper |
| Intercept | | | | -0.321 | | 0.140 | | -2.293 | | 0.022 | -0.596 | -0.046 | | 0.726 | 0.551 | 0.955 |
| Condition (Same) | | | | 0.051 | | 0.198 | | 0.256 | | 0.798 | -0.338 | 0.439 | | 1.052 | 0.713 | 1.551 |
| Test Time (Immediate) | | | | 0.870 | | 0.201 | | 4.339 | | 0.000 | 0.477 | 1.264 | | 2.387 | 1.611 | 3.539 |
| Test Time (Immediate)\*Condition (Same) | | | | 0.188 | | 0.286 | | 0.655 | | 0.512 | -0.374 | 0.750 | | 1.206 | 0.688 | 2.117 |
| Reference categories in parentheses. Only coefficients different from 0 are included in the table. | | | | | | | | | | | | | | | | |
| **Pairwise Contrasts Form Recognition (Test Time)** | | | | | | | | | | | | |
|  | Contrast Estimate | Std. Error | t | | df | | Adj. Sig. | | 95% Confidence Interval | | | |
| Lower | | Upper | |
| Immediate - Delayed | 0.235 | 0.034 | 6.997 | | 836 | | 5.352E-12 | | 0.169 | | 0.300 | |
| The sequential Bonferroni adjusted significance level is .05. Confidence interval bounds are approximate. | | | | | | | | | | | | |
|  |  |  |  | |  | |  | |  | |  | |
|  |  |  |  | |  | |  | |  | |  | |
| **Pairwise Contrasts Form Recognition (Condition)** | | | | | | | | | | | | |
|  | Contrast Estimate | Std. Error | t | | df | | Adj. Sig. | | 95% Confidence Interval | | | |
| Lower | | Upper | |
| Same - Different | 0.036 | 0.035 | 1.010 | | 836 | | 0.313 | | -0.034 | | 0.105 | |
| The sequential Bonferroni adjusted significance level is .05. Confidence interval bounds are approximate. | | | | | | | | | | | | |

**J2. Meaning Recognition**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter Estimates (Meaning Recognition)** | | | | | | | | | |
|  | B | Std. Error | t | Sig. | 95% Confidence Interval | | Exp(Coefficient) | 95% Confidence Interval for Exp(Coefficient) | |
| Lower | Upper | Lower | Upper |
| Intercept | 0.967 | 0.063 | 15.350 | 0.000 | 0.844 | 1.091 | 2.631 | 2.325 | 2.977 |
| Condition (Same) | 0.302 | 0.093 | 3.249 | 0.001 | 0.120 | 0.484 | 1.352 | 1.127 | 1.622 |
| Test Time (Immediate) | 0.105 | 0.090 | 1.164 | 0.244 | -0.072 | 0.282 | 1.111 | 0.931 | 1.326 |
| Test Time (Immediate)\*Condition (Same) | -1.341 | 0.126 | -10.609 | 0.000 | -1.589 | -1.093 | 0.262 | 0.204 | 0.335 |
| Reference categories in parentheses. Only coefficients different from 0 are included in the table. | | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pairwise Contrasts Meaning Recognition (Test Time)** | | | | | | | |  |
|  | Contrast Estimate | Std. Error | t | df | Adj. Sig. | 95% Confidence Interval | |  |
| Lower | Upper |  |
| Immediate - Delayed | 0.099 | 0.033 | 2.964 | 836 | 0.003 | 0.033 | 0.164 |  |
| The sequential Bonferroni adjusted significance level is .05. Confidence interval bounds are approximate. | | | | | | | |  |
|  |  |  |  |  |  |  |  |  |
| **Pairwise Contrasts Meaning Recognition (Condition)** | | | | | | | |  |
|  | Contrast Estimate | Std. Error | t | df | Adj. Sig. | 95% Confidence Interval | |  |
| Lower | Upper |  |
| Same - Different | 0.114 | 0.033 | 3.446 | 836 | 0.001 | 0.049 | 0.179 |  |
| The sequential Bonferroni adjusted significance level is .05. Confidence interval bounds are approximate. | | | | | | | |  |
|  |  |  |  |  |  |  |  |  |
| **Pairwise Contrasts Meaning Recognition (Condition\*Test Time)** | | | | | | | | |
| Test Time | | Contrast Estimate | Std. Error | t | df | Adj. Sig. | 95% Confidence Interval | |
| Lower | Upper |
| Immediate | Same - Different | 0.260 | 0.019 | 13.874 | 5036 | 0.000 | 0.223 | 0.296 |
| Delayed | Same - Different | -0.025 | 0.018 | -1.368 | 5036 | 0.171 | -0.060 | 0.011 |
| The sequential Bonferroni adjusted significance level is .05. Confidence interval bounds are approximate. | | | | | | | | |
|  |  |  |  |  |  |  |  |  |
| **Pairwise Contrasts Meaning Recognition (Test Time\*Condition)** | | | | | | | | |
| Condition | | Contrast Estimate | Std. Error | t | df | Adj. Sig. | 95% Confidence Interval | |
| Lower | Upper |
| Same | Immediate - Delayed | 0.274 | 0.046 | 5.974 | 836 | 3.424E-09 | 0.184 | 0.365 |
| Delayed - Immediate | -0.274 | 0.046 | -5.974 | 836 | 3.424E-09 | -0.365 | -0.184 |
| Different | Immediate - Delayed | -0.057 | 0.044 | -1.307 | 836 | 0.191 | -0.142 | 0.029 |
| Delayed - Immediate | 0.057 | 0.044 | 1.307 | 836 | 0.191 | -0.029 | 0.142 |
| The sequential Bonferroni adjusted significance level is .05. Confidence interval bounds are approximate. | | | | | | | | |

**Appendix L**

Results for RQ3. GLMMs.

**L1. Complete Initial Model for Form Recognition**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Fixed Effectsa** | | | | |
| Source | F | df1 | df2 | Sig. |
| Corrected Model | 29.741 | 7 | 4880 | 0.000 |
| Test Time | 60.924 | 1 | 4880 | 0.000 |
| Condition | 2.394 | 1 | 4880 | 0.122 |
| TFD\_Seconds | 6.330 | 1 | 4880 | 0.012 |
| Condition\*Test Time | 0.010 | 1 | 4880 | 0.920 |
| TFD\_Seconds\*Condition | 0.022 | 1 | 4880 | 0.883 |
| TFD\_Seconds\*Test Time | 0.387 | 1 | 4880 | 0.534 |
| TFD\_Seconds\*Condition\* TestTime | 2.462 | 1 | 4880 | 0.117 |
| Probability distribution: Binomial Link function: Logit | | | | |

**L2. Final model for Form Recognition (only significant effects)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Fixed Effectsa** | | | | |
| Source | F | df1 | df2 | Sig. |
| Corrected Model | 68.993 | 3 | 4884 | 0.000 |
| Test Time | 199.285 | 1 | 4884 | 0.000 |
| Condition | 5.464 | 1 | 4884 | 0.019 |
| TFD\_Seconds | 5.630 | 1 | 4884 | 0.018 |
| Probability distribution: Binomial Link function: Logit | | | | |

**L3. Parameter estimates for Form Recognition (final model)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Fixed Coefficients** | | | | | | | | | |
|  | B | Std. Error | t | Sig. | 95% Confidence Interval | | Exp(Coefficient) | 95% Confidence Interval for Exp(Coefficient) | |
| Lower | Upper | Lower | Upper |
| Intercept | -0.398 | 0.1146 | -3.473 | 0.001 | -0.623 | -0.173 | 0.672 | 0.537 | 0.841 |
| Test Time (Immediate) | 0.790 | 0.0560 | 14.117 | 0.000 | 0.680 | 0.900 | 2.203 | 1.974 | 2.459 |
| Condition (Same) | 0.131 | 0.0558 | 2.337 | 0.019 | 0.021 | 0.240 | 1.139 | 1.021 | 1.271 |
| TFD\_Seconds | 0.217 | 0.0913 | 2.373 | 0.018 | 0.038 | 0.396 | 1.242 | 1.038 | 1.485 |
| Reference categories in parentheses. Only coefficients different from 0 are included in the table. | | | | | | | | | |

**L4. Complete initial model for Meaning Recognition**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Fixed Effectsa** | | | | |
| Source | F | df1 | df2 | Sig. |
| Corrected Model | 18.670 | 7 | 4880 | 0.000 |
| TestTime | 3.499 | 1 | 4880 | 0.061 |
| Condition | 14.264 | 1 | 4880 | 0.000 |
| TFD\_Seconds | 3.798 | 1 | 4880 | 0.051 |
| Condition\*TestTime | 6.594 | 1 | 4880 | 0.010 |
| TFD\_Seconds\*Condition | 1.553 | 1 | 4880 | 0.213 |
| TFD\_Seconds\*TestTime | 4.720 | 1 | 4880 | 0.030 |
| TFD\_Seconds\*Condition\* TestTime | 0.233 | 1 | 4880 | 0.630 |
| Probability distribution: Binomial Link function: Logit | | | | |

**L5. GLMM. Final model for Meaning Recognition (only significant effects)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Fixed Effectsa** | | | | |
| Source | F | df1 | df2 | Sig. |
| Corrected Model | 25.808 | 5 | 4882 | 0.000 |
| Test Time | 3.578 | 1 | 4882 | 0.059 |
| Condition | 67.129 | 1 | 4882 | 0.000 |
| TestTime\*Condition | 6.713 | 1 | 4882 | 0.010 |
| TFD\_Seconds | 4.376 | 1 | 4882 | 0.036 |
| TFD\_Seconds\*Test Time | 4.677 | 1 | 4882 | 0.031 |
| Probability distribution: Binomial Link function: Logit | | | | |
|  | | | | |

**L6. GLMMs. Parameter estimates for Meaning Recognition (final model)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Fixed Coefficients** | | | | | | | | | |
|  | B | Std. Error | t | Sig. | 95% Confidence Interval | | Exp(Coefficient) | 95% Confidence Interval for Exp(Coefficient) | |
| Lower | Upper | Lower | Upper |
| Intercept | -0.726 | 0.1691 | -4.293 | 0.000 | -1.058 | -0.394 | 0.484 | 0.347 | 0.674 |
| Test Time (Immediate) | -0.372 | 0.2448 | -1.520 | 0.128 | -0.852 | 0.108 | 0.689 | 0.426 | 1.114 |
| Condition (Same) | -0.082 | 0.2257 | -0.363 | 0.716 | -0.524 | 0.360 | 0.921 | 0.592 | 1.434 |
| Test Time (Immediate)\*Condition (Same) | 1.121 | 0.4325 | 2.591 | 0.010 | 0.273 | 1.969 | 3.067 | 1.314 | 7.161 |
| TFD\_Seconds\*Test Time (Immediate) | 0.394 | 0.1820 | 2.163 | 0.031 | 0.037 | 0.750 | 1.482 | 1.037 | 2.118 |
| TFD\_Seconds\*Test Time (Delayed) | 0.001 | 0.1298 | 0.007 | 0.994 | -0.253 | 0.255 | 1.001 | 0.776 | 1.291 |
| Reference categories in parentheses. Only coefficients different from 0 are included in the table. | | | | | | | | | |