

**Effects of Grammatical Gender and  
Category Repetition in True and False  
Recognition Memory**

**Doctoral Thesis**

**Prof. Dr. Joachim Funke**

**PD Dr. Lisa Irmen**

**Department of Psychology**

**University Heidelberg**

**By**

**PHD Candidate Xuqian Chen**

**Heidelberg**

**18. 11. 2008**

## **Acknowledgment**

I am deeply indebted to my advisors, PD Dr. Lisa Irmen and Professor Dr. Joachim Funke, for their constant supports. Without their helps, this work would not be possible. I would also like to thank Daniel Holt and Sven Brüssow for their invaluable advice on researching and computer programming. Special thanks also go to workmates who greatly enriched my knowledge about eye-tracking.

I would like to thank Dr. Steve Dewhurst in Lancaster University for his advice on the experiment materials. Without his help, my study will last much longer.

I am also indebted to the friends in Germany. With these good friends, I never felt lonely during these four years, and conquered every problem I had.

Lastly, I would like to thank my family for their support. I am greatly indebted to my husband Guixiang Wang who gives me deep love and the encouragement. I never forget the time he spends with me in Germany and China. Above all, I cannot express my full gratitude to my father Jianmin Chen and mother Zaojin Lei. They are always with me when I am joyful, upset, or nervous. Every time when I finish talking with them, I feel I have the power to continue, no matter what kinds of problems I have.

I dedicate this thesis to my parents and my husband.

## **Abstract**

Five experiments were conducted to investigate the interference between grammatical gender and false memory in German. In Experiment 1 (N=42), the feminine grammatical gender category served as the grammatical gender of the targets and lures, while the masculine occurred only in the lure words. The occurrence of feminine gender in both the targets and lures resulted in lower proportions of correct rejections than when targets were feminine and lures were masculine. This indicates that grammatical gender was processed as a cue to reject the lures with two-gender condition in the recognition tasks. In Experiment 2 (N=90), a three-gender manipulation was introduced, in which two of the three grammatical genders in German served as the grammatical gender of the targets and lures, while the other one was used only as lures. Neither the combination of feminine and neuter, nor of feminine and masculine, resulted in higher proportions of correct rejections on the gender-unrelated lures in comparison with gender-related lures. By contrast, the combination of masculine and neuter caused more correct rejections on the feminine lures than both against the masculine and against the neuter lures. It is claimed that the similarity of grammatical gender between masculine and neuter did not facilitate identifying the masculine and the neuter items. This might be because of the likelihood that the masculine and the neuter words use the same indefinite articles (i.e. *ein*) or definite articles in, for example, dative (i.e. *dem*). Thus, Experiment 3 and 4 extended the design of Experiment 2 with determiners. In Experiment 3 (N=45), nouns were displayed with definite articles; by contrast, in Experiment 4 (N=45),

pseudo articles, which had the same gender-marked endings as the indefinite articles used by different genders, were presented with nouns. It showed that the advantages of gender unrelated lures found in Experiment 2 disappeared in Experiment 3, but were found again in Experiment 4. The definite articles used in Experiment 3 resulted in a more difficult task; therefore, the grammatical gender effect was inhibited. However, the pseudo articles facilitated distinguishing the feminine noun phrases from both the masculine and neuter noun phrases. Grammatical genders were considered to be used as a memory cue, connected with appropriate articles that can be activated during recognition tasks. Using bare nouns and nouns with pseudo-article noun phrases, false memory caused by gender cues occurred in two conditions: (1) the targets and lures are of the same grammatical gender; (2) the masculine and the neuter words are used as the materials, when one of those acted as targets and the other as lures. In addition, Eye-tracking was used in Experiment 5 (N=30) and showed that feminine targets caused fewer hits than either masculine or neuter words in the recognition task in a forced choice paradigm. Longer fixation times were found for both feminine targets and lures, than for either masculine or neuter items. By contrast, hits of masculine targets were as frequent as those for neuter targets. Because of this it is assumed that feminine grammatical gender is more easily processed as a gender cue in the recognition task. In the cases of stimuli that included either masculine or neuter words, grammatical gender information was not as easy as a cue. Recognition tasks were influenced mainly by semantic category effect, so that lures, which were only grammatically gender related but semantically unrelated to the target, were more

easily rejected. Targets were fixated for a shorter period of time and received more hits. In the case of stimuli that included feminine words, gender cue is more easily used during the recognition tasks. Lures were influenced by grammatical gender effect and therefore became difficult to be rejected. Targets were fixated on longer and were more frequently confused with lures. The proportion of hits became low for feminine targets. In other words, recent results indicated that feminine gender was more easily used as a memory cue when compared with masculine and neuter.

**Key words:** grammatical gender, semantic category, repetition, false memory, bare nouns, determiner noun phrase