

The relation between intentional and incidental memory in healthy young versus older individuals.

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INTRODUCTION

Episodic memory has two components:

Intentional memory refers to those situations that individuals are instructed to memorize material presented in a specific context and time. Intentional memory is considered an effortful procedure that engages attentional and executive resources and is believed to be an efficient way for memorizing new information (Vingerhoets, 2005, Karrasch et al., 2010).

On the contrary, encoding of information can be achieved incidentally without the intention to memorize. Incidental memory is an unintentional effortless procedure and is believed to be a more prominent function in everyday life (Vingerhoets, 2005).

Although there have been some attempts to investigate incidental memory, the latter along with intentional memory has not been systematically researched.

AIMS

The present study examines the relationship between gender and age with incidental/intentional memory in healthy drivers participating in a driving simulation experiment as well as the relation of these processes with tasks that engage attentional and executive resources.

PATIENTS & METHODS

A total of 32 healthy right-handed participants participated in a driving simulation experiment and were evaluated through a comprehensive neuropsychological battery.

Participants were divided into groups according to the gender (Males: N=16, Females: N=16) and according to age (20 younger with a mean age 32,3 ± SD= 9,7 years and 12 older with a mean age 60,2 ± SD= 7,7 years)

Incidental memory was assessed with an 8-item questionnaire including elements from their driving task, without warning while intentional memory was measured by Hopkins Verbal Learning Test-Revised (HVLTR)

In addition participants were being assessed in attention and executive functions such as working memory, vigilance and general, sustained, selective and divided attention by the administration of the following neuropsychological tests: Useful Field of View (UFOV), Psychomotor Vigilance Test (PVT), Letter Number Sequencing (LNS), Spatial Span Task, Spatial addition test, Trail Making Test (TMT) and Comprehensive Trail Making (CTMT)

Two Independent t-test were conducted in order to examine the difference in percentage means of retention in incidental and intentional memory according to gender (chart 1) and age (chart 2)

Furthermore, Table 1 shows the correlations between intentional/incidental memory with neuropsychological tests assessing attentional and executive operations.

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ABSTRACT

Introduction: Intentional memory refers to the effortful procedure during which information is memorized. Incidental memory refers to the unintentional effortless encoding of information and is considered to be a more prominent function in everyday life but has not been yet studied systematically.

The aim of this study is to investigate the relationship between incidental memory and intentional memory in healthy drivers participating in a driving simulation experiment as well as the relation of these processes with tasks that engage attentional and executive resources.

Methods: 32 healthy participants (20 younger with a mean age 32,3 ± SD= 9,7 years and 12 older with a mean age 60,2 ± SD= 7,7 years, 16 males and 16 females) participated in a driving simulation experiment and underwent detailed neuropsychological testing. Incidental memory was assessed with a questionnaire regarding elements from their driving task, without previous notice.

Results: No significant results were found in incidental/intentional and gender. Younger participants had better performance on the incidental memory task while older participants had better performance on the intentional memory task, $t(30)=2.17, p=0.038$. Tests engaging attentional and executive resources correlated more with incidental memory ($r = 0,37 - 0,65$) than with intentional memory ($r = 0,05 - 0,48$).

Conclusions: The process of memorizing information through incidental and intentional mnemonic processes appears to be influenced by the function of age. Moreover, attentional and executive processes appear to play a more prominent role in incidental than intentional memory

RESULTS

Chart 1. Percentage Means of retention in Incidental and Intentional memory according gender

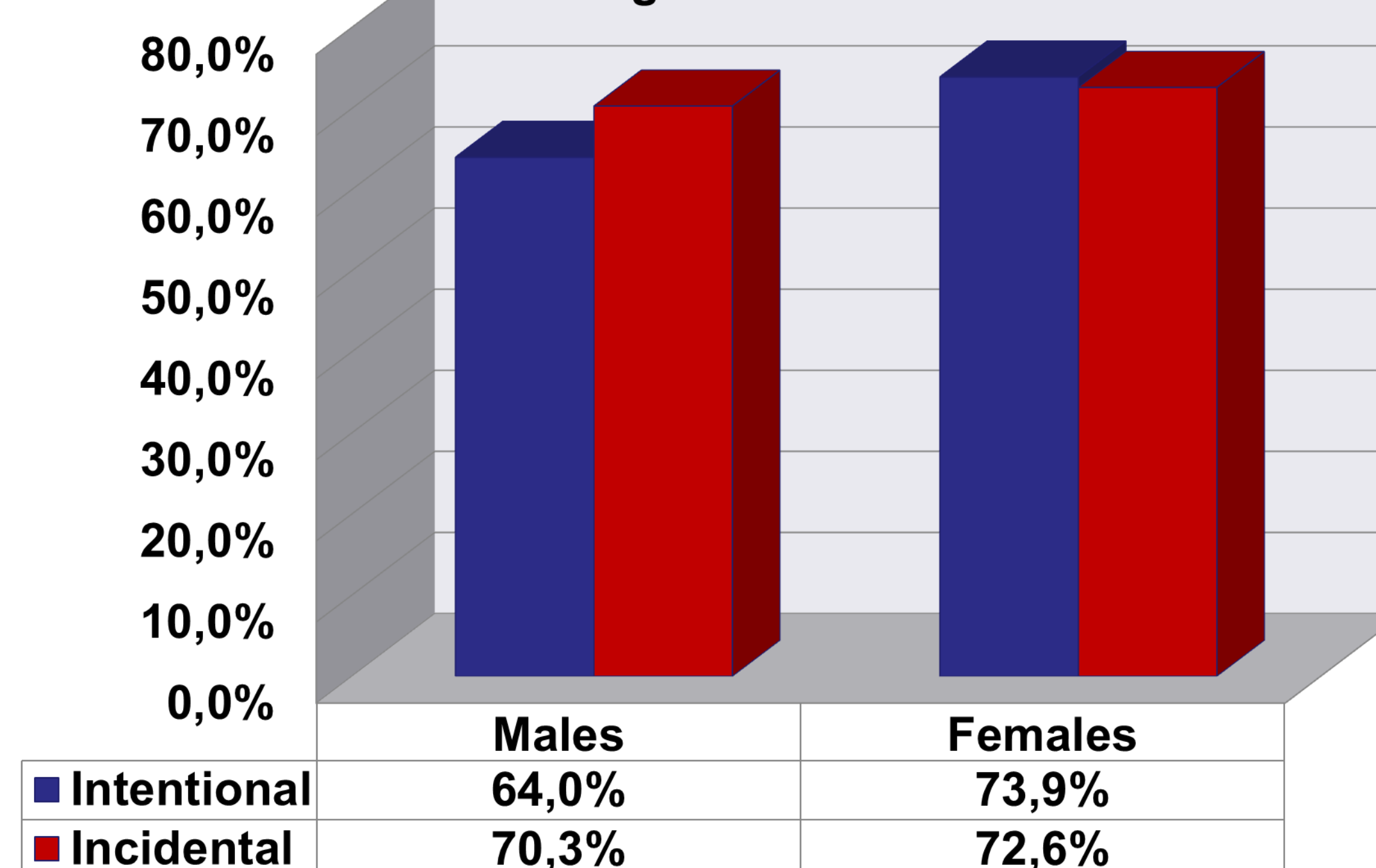


Chart 2. Percentage Means of retention in Incidental and Intentional memory according age

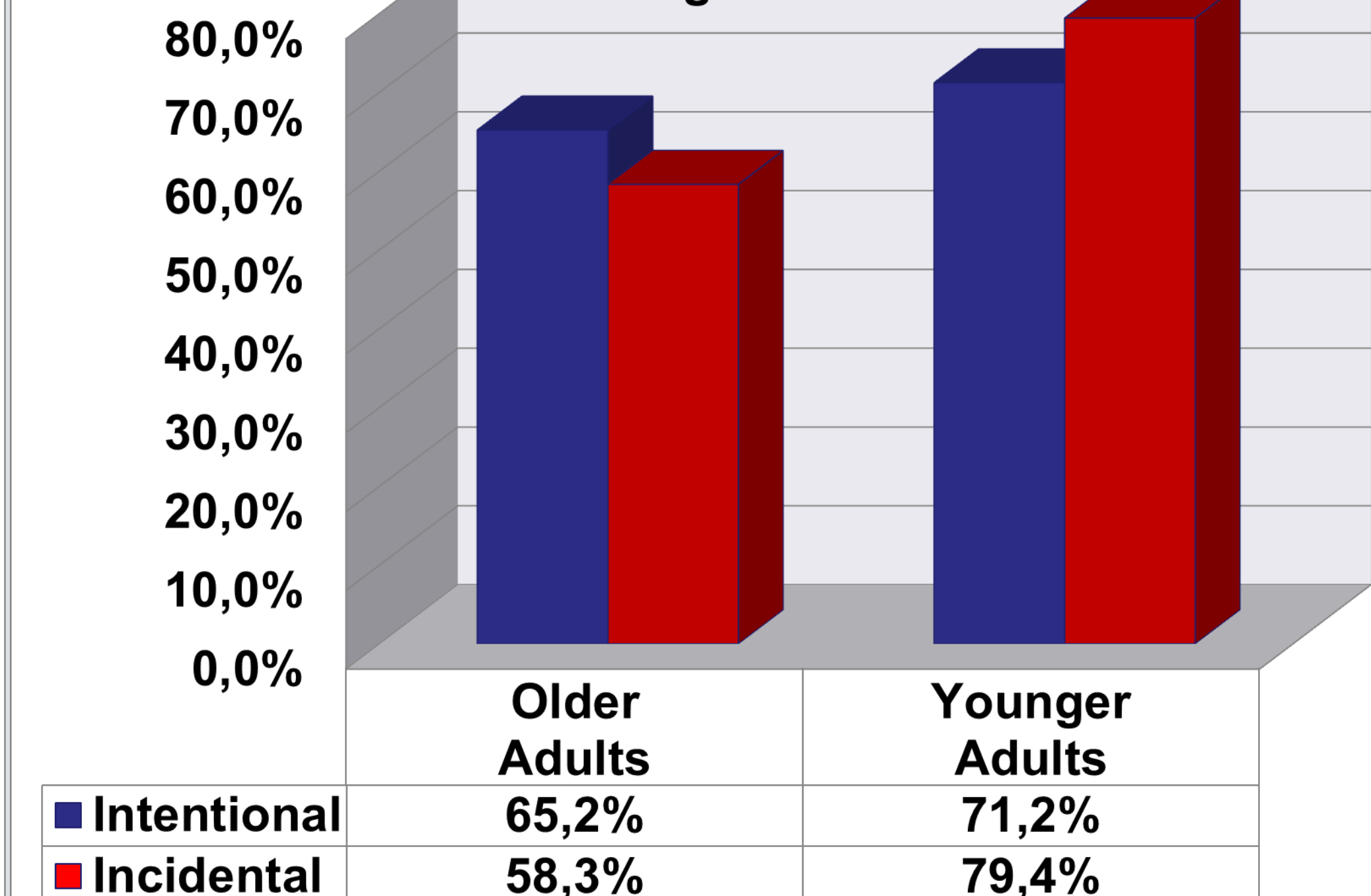


Table 1. Correlation of tasks engaging attentional and executive resources with indexing of incidental and intentional memory

	LNS	TMTA	TMTB	CTMT1	CTMT2	CTMT3	CTMT4	CTMT5	UFOV3	Spatial Ad.
Incidental	0,37*	-0,38*	-0,55**	-0,65**	-0,51**	-0,45*	-0,63**	-0,61**	-0,42*	0,44
Intentional	0,20	-0,05	-0,37*	-0,26	-0,07	-0,35	-0,21	-0,48**	-0,19	0,17

DISCUSSION

The pattern of retention for intentional vs. incidental memories was not influenced by gender ($t(30)=-0.04, p=0.965$). The current study is in line with previous research that used non verbal material for non effortful learning (Chipman and Kimura,1998, Ryan et al., 2008). On the contrary, previous findings indicate an advantage of females in incidental memory tasks of verbal nature. This could be explained by gender-related differences in verbal abilities.

Our results indicate age affects both on incidental and intentional memory. However, there was a greater change in incidental than intentional memory ($t(30)=2.17, p=0.038$). Elderly appear to be able to retain more easily information that have intention to memorize than recalling mnemonic events of incidental nature.

Incidental memory exhibits a greater association with attentional and executive functions, which are one of the first mental abilities affected by normal aging.

CONCLUSION

Incidental and intentional mnemonic processes appears to be influenced by the function of age but not according to gender

Attentional and executive processes appear to play a more prominent role in incidental than intentional memory

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