Lab Report – Memory Span – Data

Many theories of cognition propose that there is a short-term or working memory system that is able to hold a limited amount of information for a short period of time. The memory span experiment is one measure of working memory capacity. In this experiment, participants are given a list of items and asked to recall the list. The list length is varied to see at what list length participants will make make few errors. That list length is the memory span for that person on that task. Individuals with larger memory spans can better keep in mind different stimuli, and this seems to give them an advantage for a wide variety of cognitive tasks. Memory span has been linked to performance on intelligence tests, standardised tests, reading skills, problem solving, and a variety of other cognitive tasks.

The very existence of short-term memory is largely based on memory span types of experiments, as it was noted that memory span was approximately seven items (plus or minus two) for a wide variety of stimuli. This suggested a simple storage system that held approximately seven items. Later studies demonstrated that memory span could be systematically influenced by a variety of stimulus characteristics, including the type of item. These findings have suggested that the capacity of short-term memory is controlled by verbal processes. This experiment allows you to measure your memory span for three different stimulus types.

Methods

On each trial, you saw a list of items presented one at a time in random order and were asked to recall the items in the same order in which they were presented. If you got a list correct, the list length increased by 1 for that type of material. If you got a list incorrect, the list length decreased by 1.

The independent variable is the type of material you were asked to recall: digits, letters, or words. Memory span can be measured in lots of different ways. In this lab, the dependent variable is the length of the last list you correctly recalled.

The first list of each type of item was 3 items long. The longest list that was shown was 10, so the maximum score possible is 10.

Independent Variable

Our Independent Variable (IV) is “Type of List” or “List Type” or “Stimulus Type”: digits, letters, or words.

Dependent Variable

Our dependent variable (DV) is the length of the last list that was correctly recalled.

Analyses

A repeated-measures ANOVA was conducted with an alpha level of 0.05.

Within-Subjects Factors

Measure: Length

ListType	Dependent Variable
1	Digits
2	Letters
3	Words

Descriptive Statistics

	Mean	Std. Deviation	N
Digits	6.3514	1.07575	111
Letters	5.7568	1.28782	111
Words	3.8829	.83925	111

Tests of Within-Subjects Effects

Measure: Length

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
ListType	Sphericity Assumed	368.456	2	184.228	268.631	<.001	.709
	Greenhouse-Geisser	368.456	1.971	186.932	268.631	<.001	.709
	Huynh-Feldt	368.456	2.000	184.228	268.631	<.001	.709
	Lower-bound	368.456	1.000	368.456	268.631	<.001	.709
Error(ListType)	Sphericity Assumed	150.877	220	.686			
	Greenhouse-Geisser	150.877	216.818	.696			
	Huynh-Feldt	150.877	220.000	.686			
	Lower-bound	150.877	110.000	1.372			

Pairwise Comparisons

Measure: Length

(I) ListType	(J) ListType	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
1	2	.595*	.116	<.001	.312	.877
	3	2.468*	.105	<.001	2.214	2.723
2	1	-.595*	.116	<.001	-.877	-.312
	3	1.874*	.112	<.001	1.601	2.147
3	1	-2.468*	.105	<.001	-2.723	-2.214
	2	-1.874*	.112	<.001	-2.147	-1.601

Based on estimated marginal means

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

b. Adjustment for multiple comparisons: Bonferroni.