

order to choose their path. For example, **Figure 2** shows the view from the start box. Note that there are just two directional options active (straight ahead and right) from the start box. On subsequent choices, only viable options are active. When participants reach a dead end, the only active choice will be a backward movement.

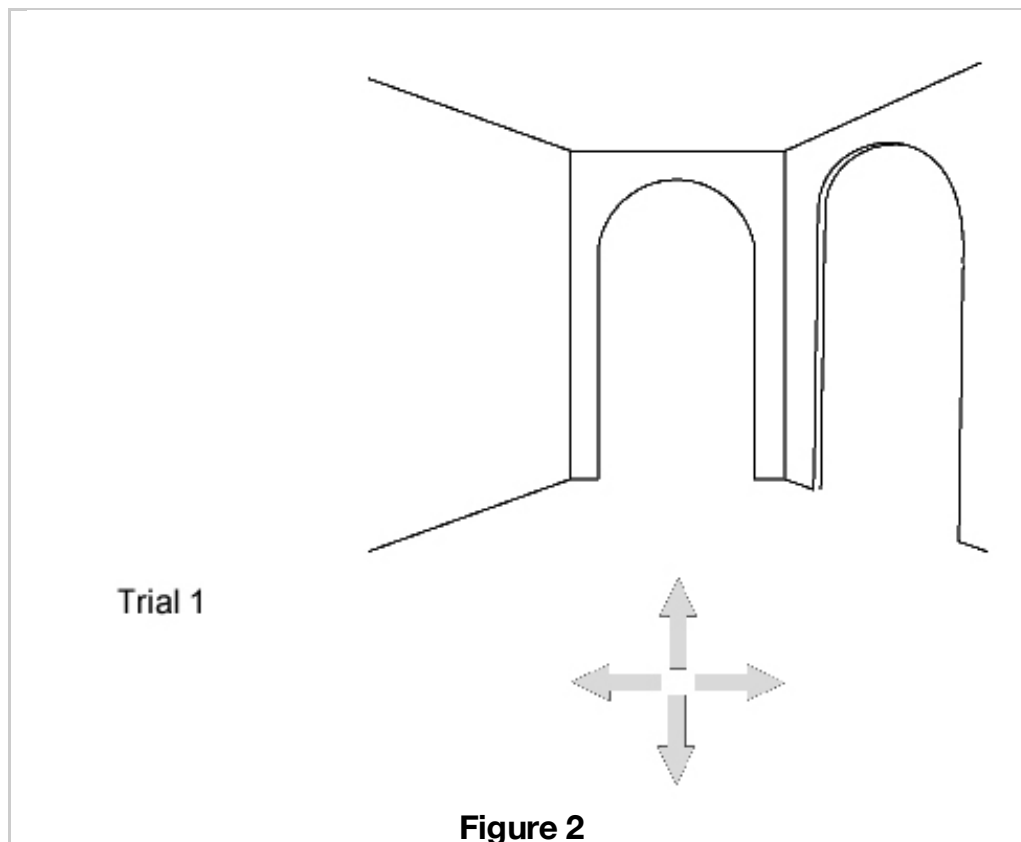


Figure 2

Design

There are two dependent measures for this study. Timing is the first measure and reflects the elapsed time for completion of the maze. If participants return to the start box before entering the finish box, the timing is not restarted.

The second dependent variable is error. The numbers of errors are recorded during each trial. Each time an incorrect movement, which results in a deviation from the correct path is made, it counts as one error. Each subsequent movement along that incorrect path is not counted as an additional error.

The experiment requires that participants complete the maze 15 times. Data can be plotted for each of the 15 trials and should reflect a decrease in the time to complete the maze.

Data can also be aggregated. Typical learning studies average a series of trials into one block. In experimental design, a "blocking variable" is used to capture unwanted variance from a nuisance variable. The term "block" in this study refers simply to a set of trials. Choice of block size is simply a matter of desired resolution. In the study of human and animal learning, block sizes of 1 (i.e., trial by trial report) are apt to produce jagged learning curves. Block sizes that are too large may miss an important temporal aspect to learning. So the trick is to find a proper block size. We have used 3 and that seems to work quite well. These blocks can then be plotted and the resulting graph produces a smoother representation of learning. In this study, it would be appropriate to average trials in groups of 3 and this would result in 5 data points.

Data Format and Download

Data are downloadable in three formats (XML, Excel spreadsheet format, and comma delimited for statistical software packages like SPSS). Definitional information for each of the labeled columns are shown in **Figure 3**.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	UserID	Gender	ClassID	Age	DateTaken	TimeInE	T1T	T1E	T2T	T2E	T3T	T3E	T4T	T4E
2	3137	M	1522	29	2/8/2006	139.07	13.763	1	7.197	0	6.518	0	5.558	0
3	3139	F	1522	20	2/8/2006	242.58	21.698	2	14.703	1	10.979	0	10.85	0
4	3140	F	1522	21	2/8/2006	254.67	34.26	2	16.677	1	9.003	0	8.552	0
5	3141	M	1522	35	2/8/2006	297.09	28.15	1	29.17	2	18.409	0	13.14	0
6	3142	F	1522	26	2/8/2006	312.57	34.489	2	20.22	1	22.076	2	20.37	3
7	3143	F	1522	20	2/8/2006	403.89	23.582	2	49.303	5	20.313	2	29.83	5
8	3144	M	1522	20	2/8/2006	249.43	25.784	2	21.647	2	10.372	0	10.65	0

Figure 3

The first column provides the [participant ID number](#). The third column provides the [class](#) ID for which a participant's data is affiliated. Gender (column 2) and age (column 4) are self-explanatory. The date of participation is located in column five. Columns labeled T1T-T15T reflect **time** for completion of trials 1-15. Columns labeled T1E-T15E reflects **errors** for completion of the maze for trials 1-15.

Data Analyses

In this repeated trials study, it would be appropriate to conduct a repeated measure ANOVA for time and/or errors in the maze task. The ANOVA can be conducted using all 15 trials or the 5 suggested blocks.

Applications and Extensions

This study can be used to illustrate classic learning experiments in which rats or people explore novel situations and make decisions based on stimuli that produce desired outcomes. Early learning studies were conducted at the basic level of analysis and provided a foundation for cognitive processing (see Hilgard, 1948). Newer models suggest that learning is multifaceted and may be influenced by multiple factors (Ahsen, 2000). Nevertheless, analyses of the results of this study provide students with understanding of the basic elements or building blocks of cognition.

References

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