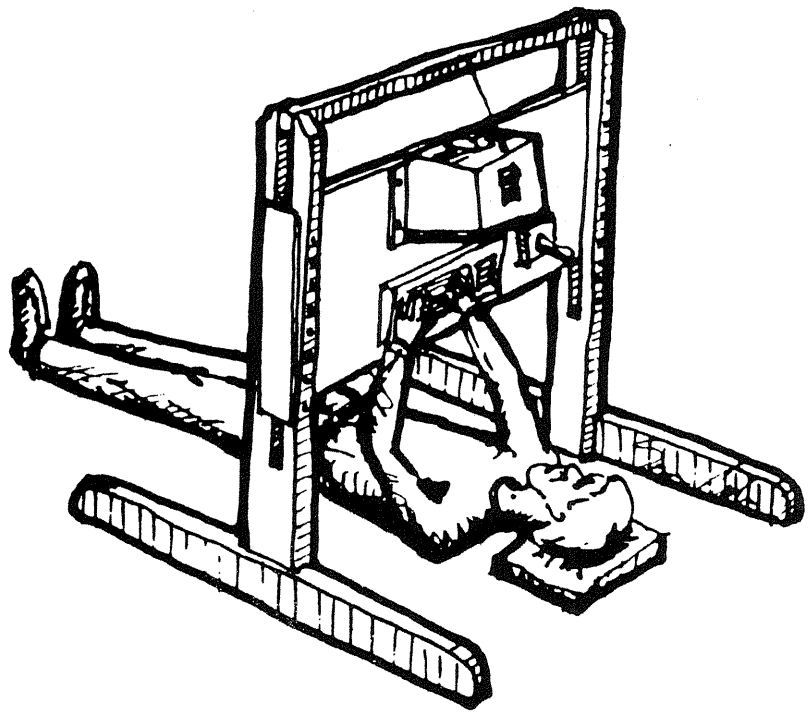
A subject operating MWPE in the *Upright postural position*



A subject operating MWPE in the *Supine postural position*

Figure 1. MWPE postural orientations for test battery one.

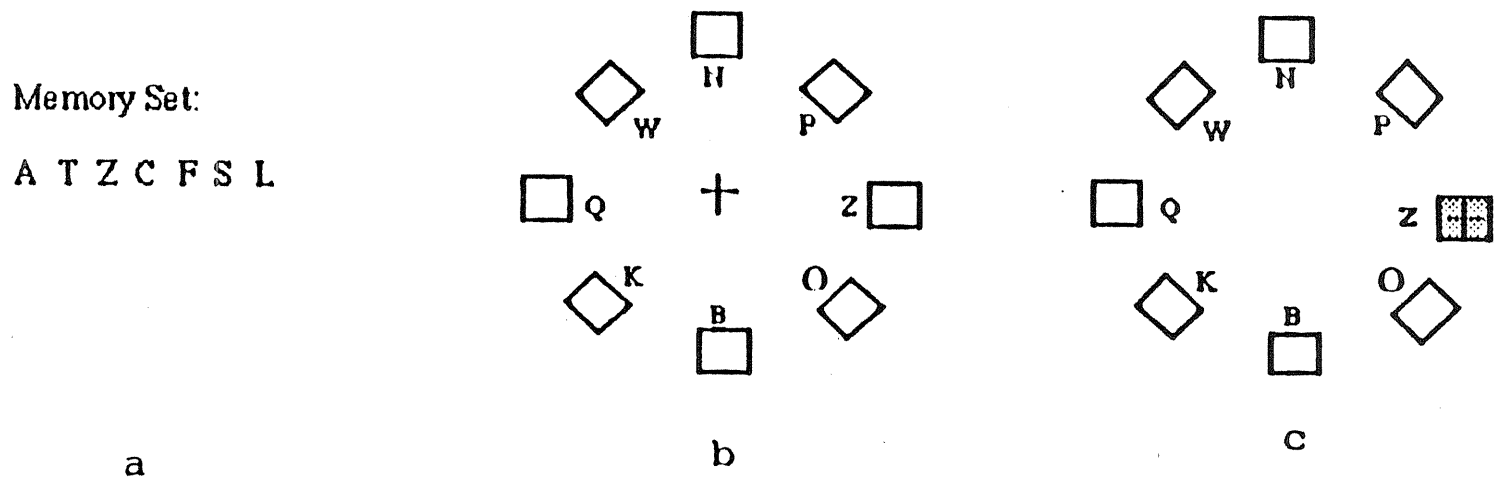


Figure 2a: Memory set presentation, b: Test stimulus screen, c: Simulated recognition and target acquisition.

Table 1. Student-Newman-Keuls t-test results of individual subjects for test battery one.

		REACTION TIME								MOVEMENT TIME							
		SUBJECT								SUBJECT							
		1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
EXPERIMENTAL CONDITION: POSTURAL ORIENTATION	NOMENCLATURE: UPSUP																
	Upright -0			X		X	X					X	X				X
	Supine -1																
EXPERIMENTAL VARIABLES:	DEVICE																
	Keyboard -0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Joystick -1	X				X	X	X		X	X	X	X	X	X	X	X
	Trackball -2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	DIRECTION																
	Diagonal -0	X	X	X	X		X		X	X	X	X	X	X	X	X	X
	Cardinal -1																
	DIFFICULTY																
	Easy -0					X			X	X	X	X	X	X	X	X	X
	Hard -1																
	MEMORY SET																
	One Letter -0	X	X	X	X	X	X	X	X	X	X		X				
	Four Letters -1																

The Xs signify statistical significance between two parameters.
A comparison is made between two variables.
For example, the X in the Upright row and Subject 5 column signifies a statistical significance between the Upright and Supine conditions for Subject 5 during Reaction Time.
The three Xs for all of the devices under Subject 7 shows statistical significance between all three devices for Reaction Time, whereas, the two Xs for Keyboard and Trackball under Subject 2 show statistical significance between the Keyboard and Joystick (the X appears in the row of the variable that appears first) and the Trackball and Keyboard, but there is no statistical significance between the Joystick and Trackball for Subject 2 during Reaction Time.
Detailed thesis results can be found in Reference 10.

Table 2. Average reaction times

Memory Set Size		Response Entropy (bits)	Reaction Time (milliseconds)	
Battery One	*Battery Two*		*Battery One*	*Battery Two*
1	1	0.0	520	674
	2	1.0		894
4	4	2.0	790	1340
	7	2.8		1990

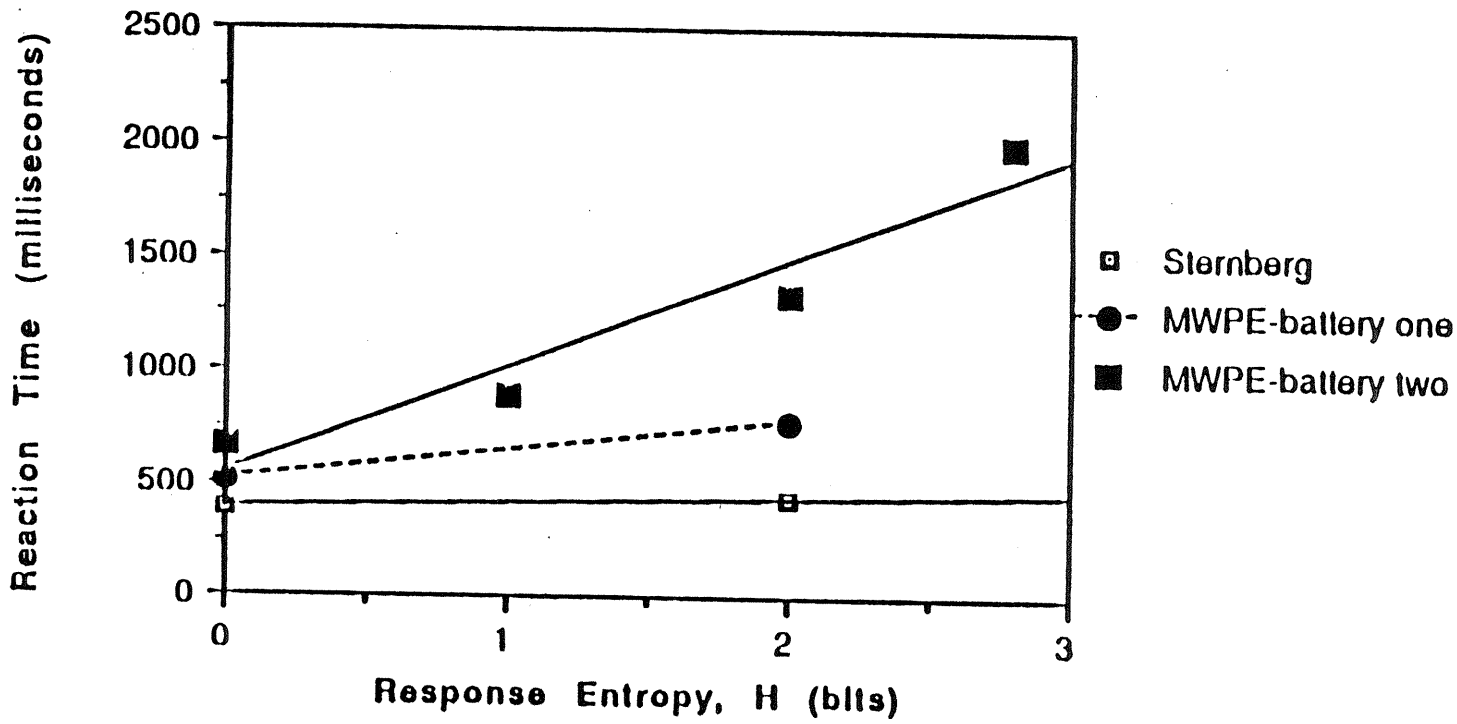


Figure 3. Reaction time versus response entropy.

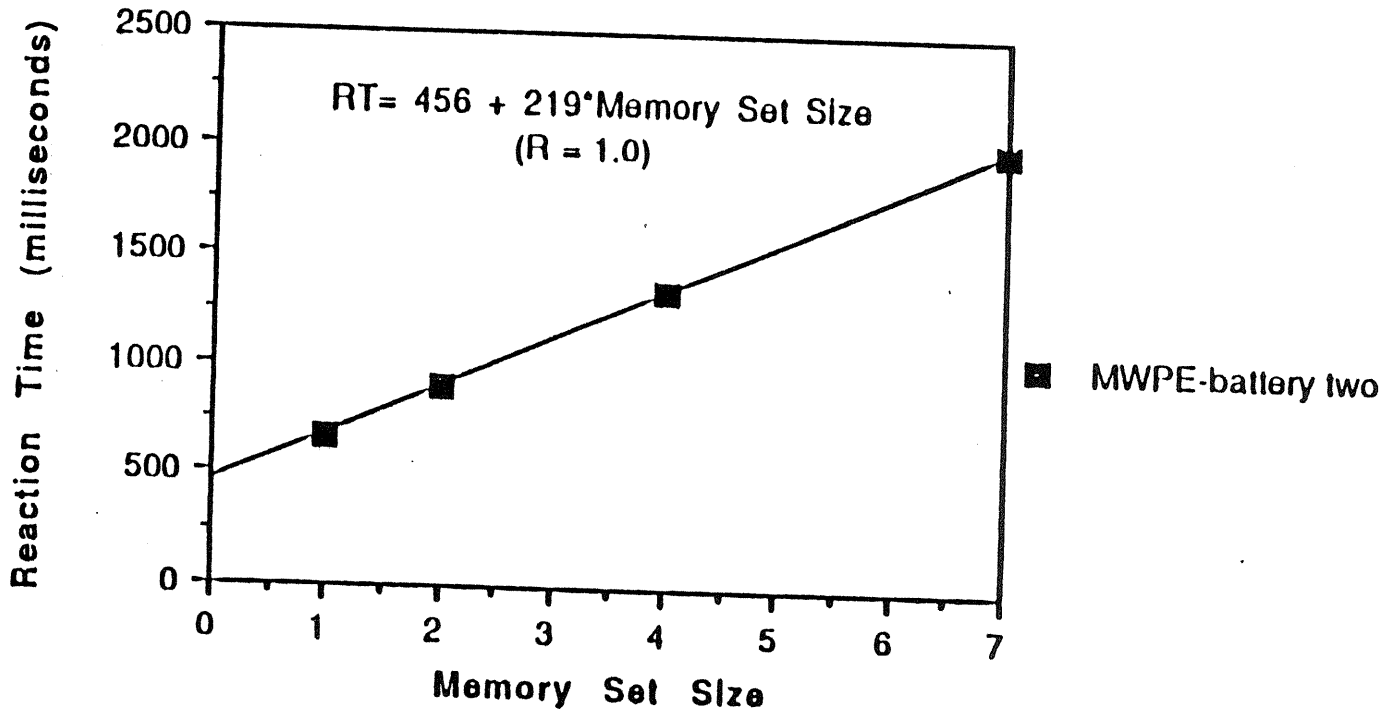


Figure 4. Reaction time versus memory set size.

Table 3. Average movement times

Index of Difficulty		Movement Time (milliseconds)			
Battery One	*Battery Two*	*Battery One*		*Battery Two*	
		Upright	*Supine*	*No Lag*	*Lag*
	1.5			882	1294
2.6	2.4	818	855	1042	1476
	2.8			1142	1572
4.3	3.7	1394	1454	1260	1893

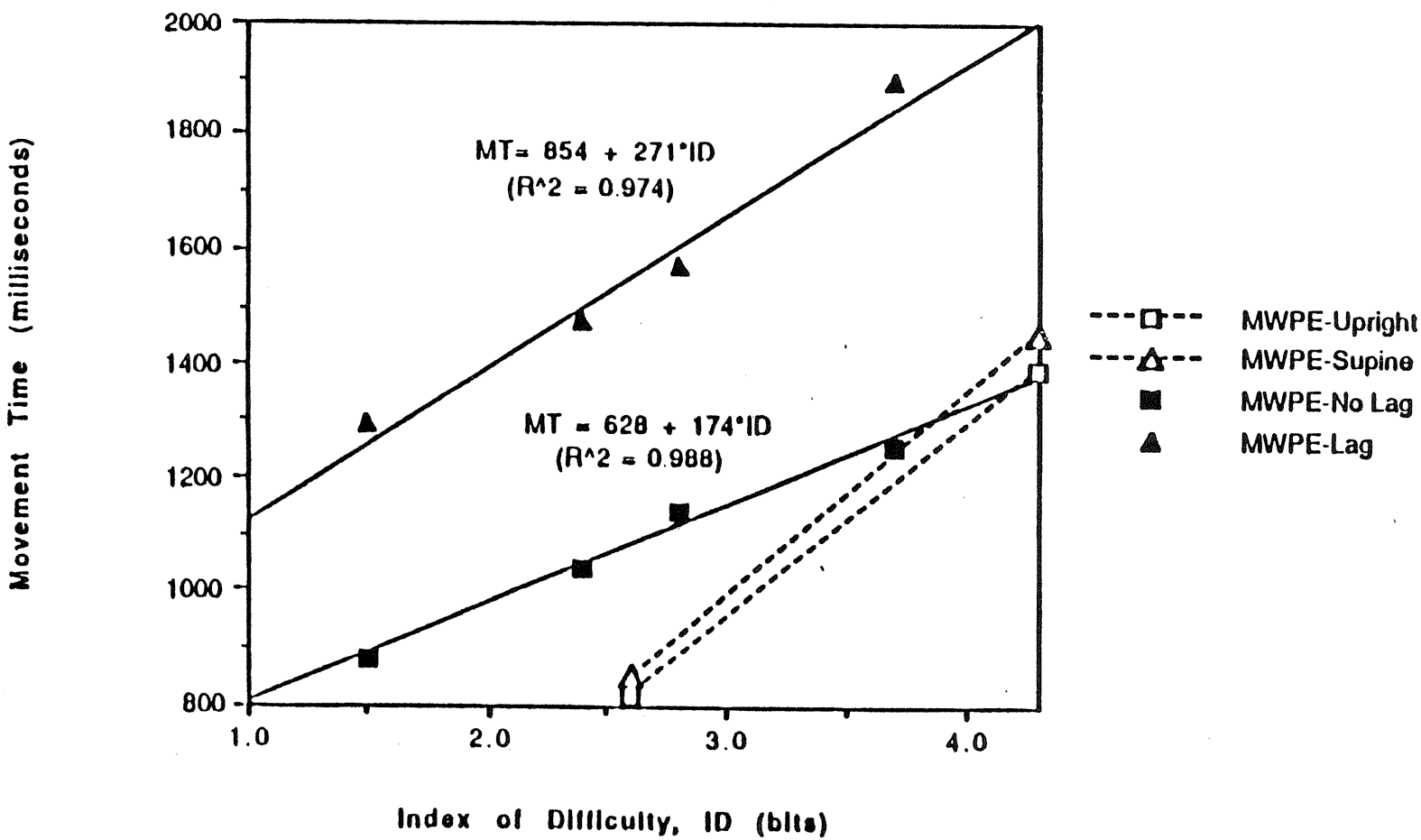


Figure 5. Movement time versus index of difficulty for all orientation conditions.

Table 4. Definition of the dependent variables in the regression analysis.

Alt Posture/Lag - is a binary variable and takes on values of zero and one. The variable has a value of zero for experiments run in the upright orientation or when the trackball had no lag characteristics. The variable has a value of one when the supine orientation or lag conditions were used.

Direction - is also a binary variable. Direction takes on values of zero for cardinally aligned targets and the value of one for diagonally aligned targets.

Index of Difficulty - takes on actual calculated values.

Memory Set Size - takes on values corresponding to the number of letters in the memory set.

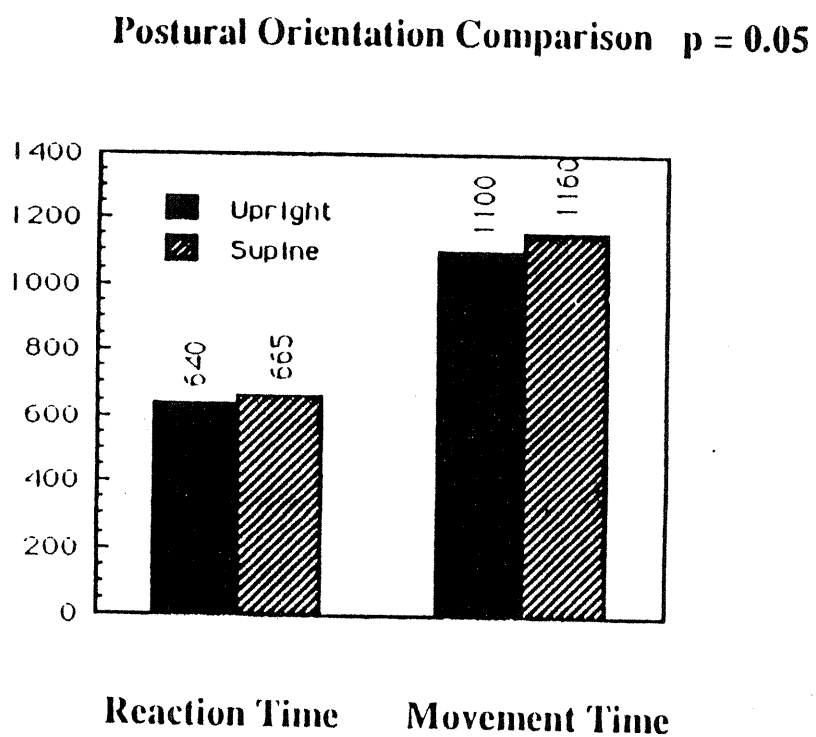


Figure 6. Performance Measurement Summary.

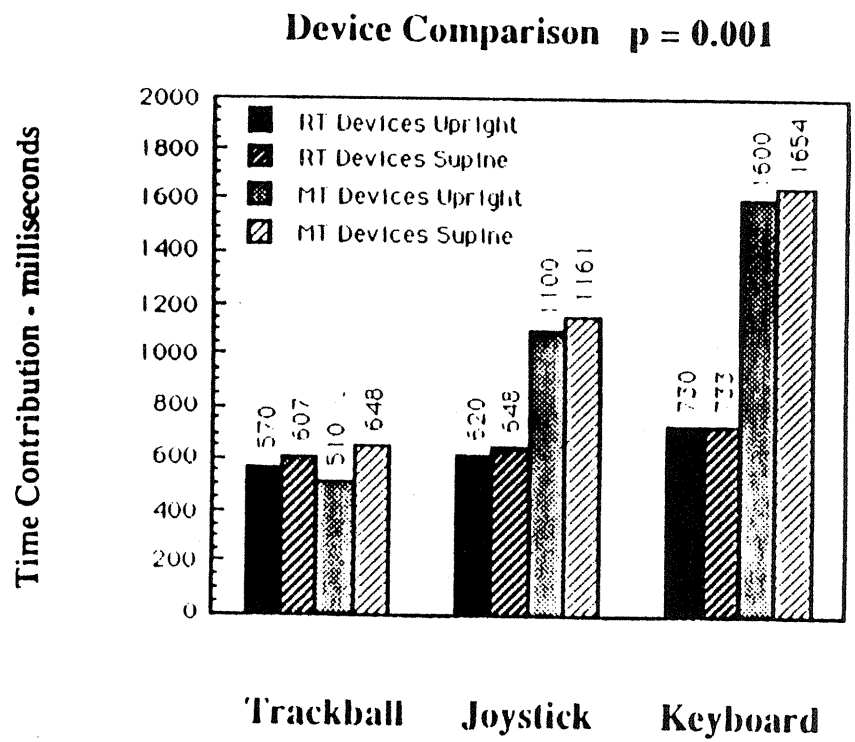


Figure 7. Graphic Input Device Summary.

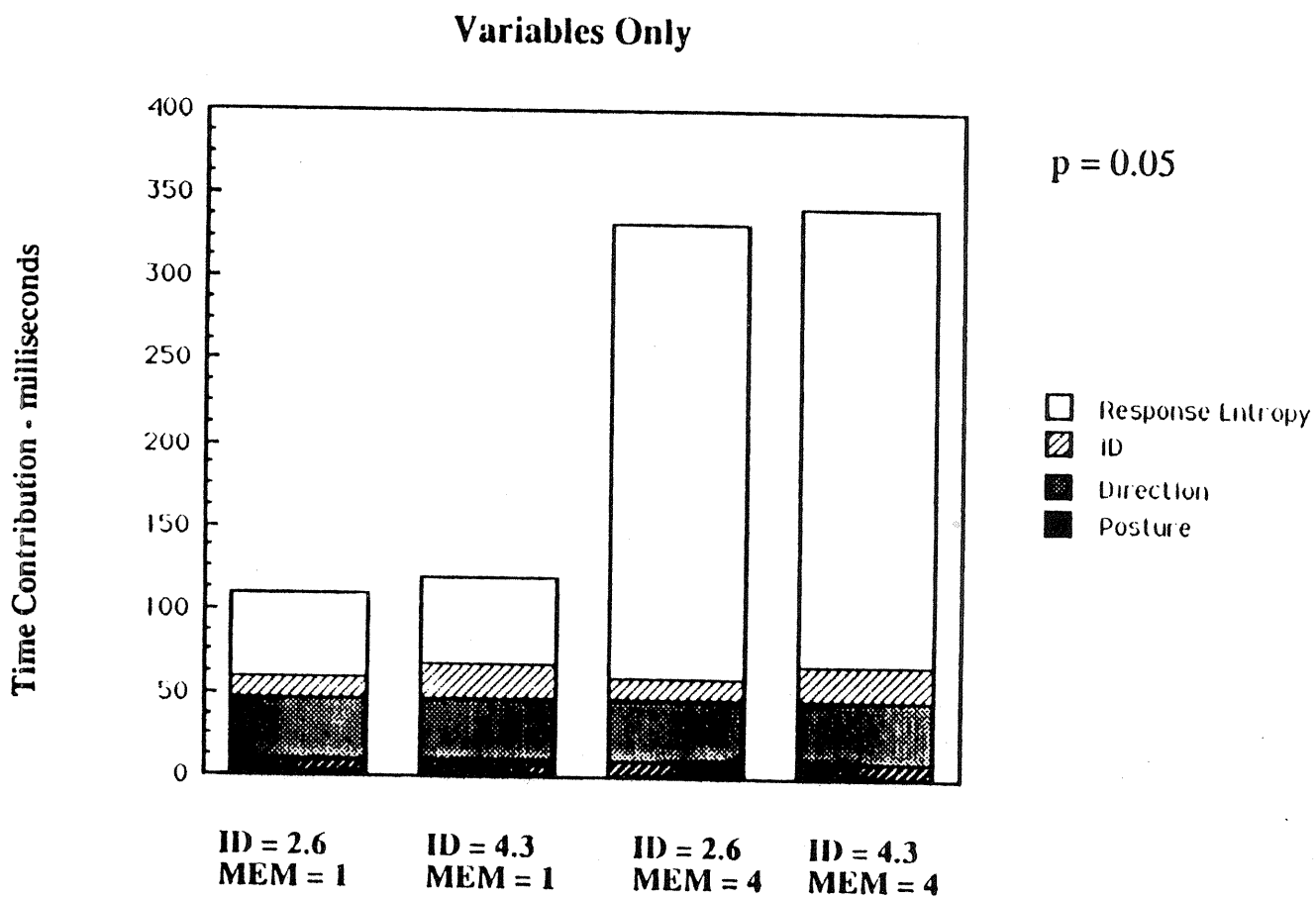


Figure 8. Reaction Time Model Variables.

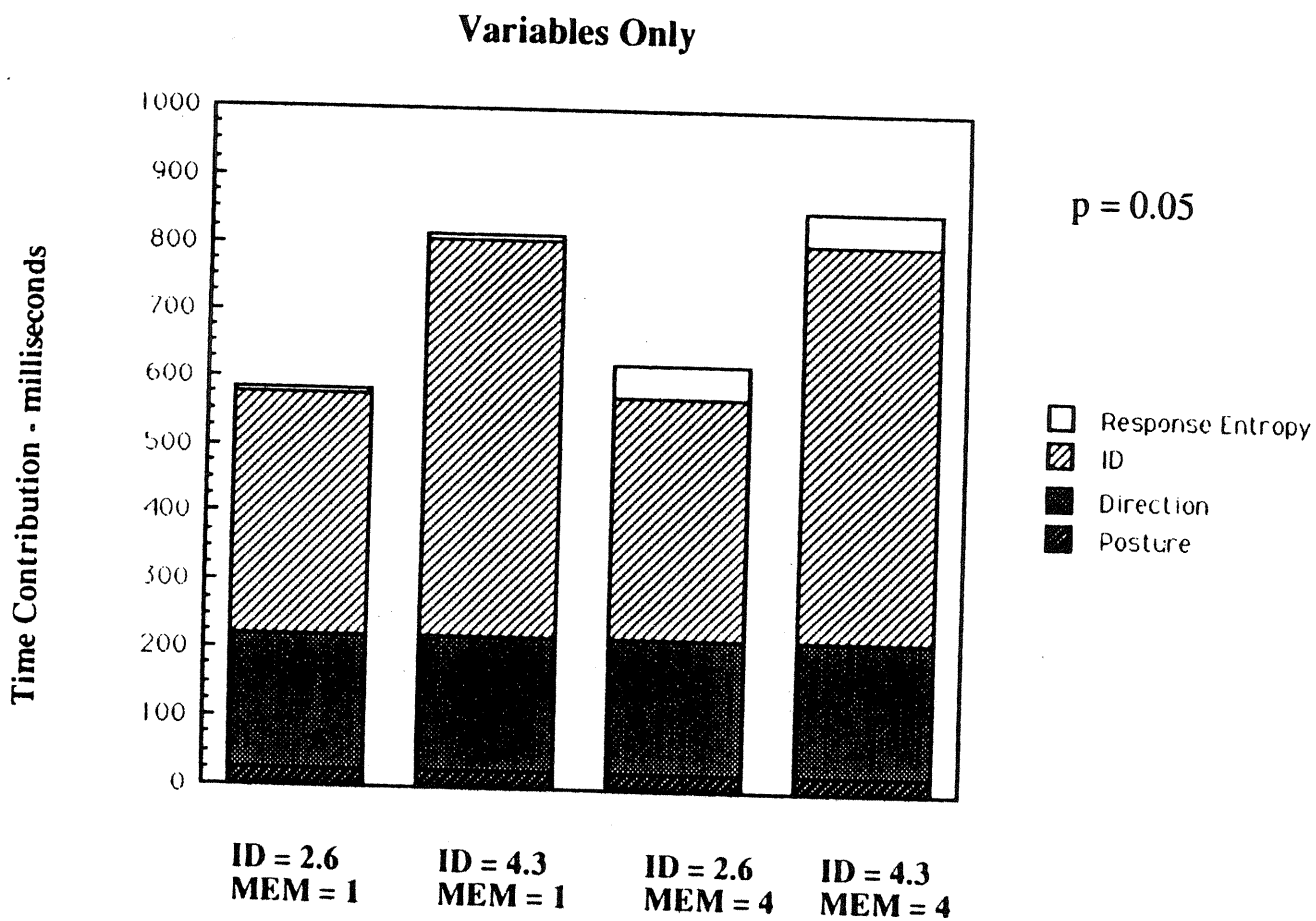


Figure 9. Movement Time Model Variables.