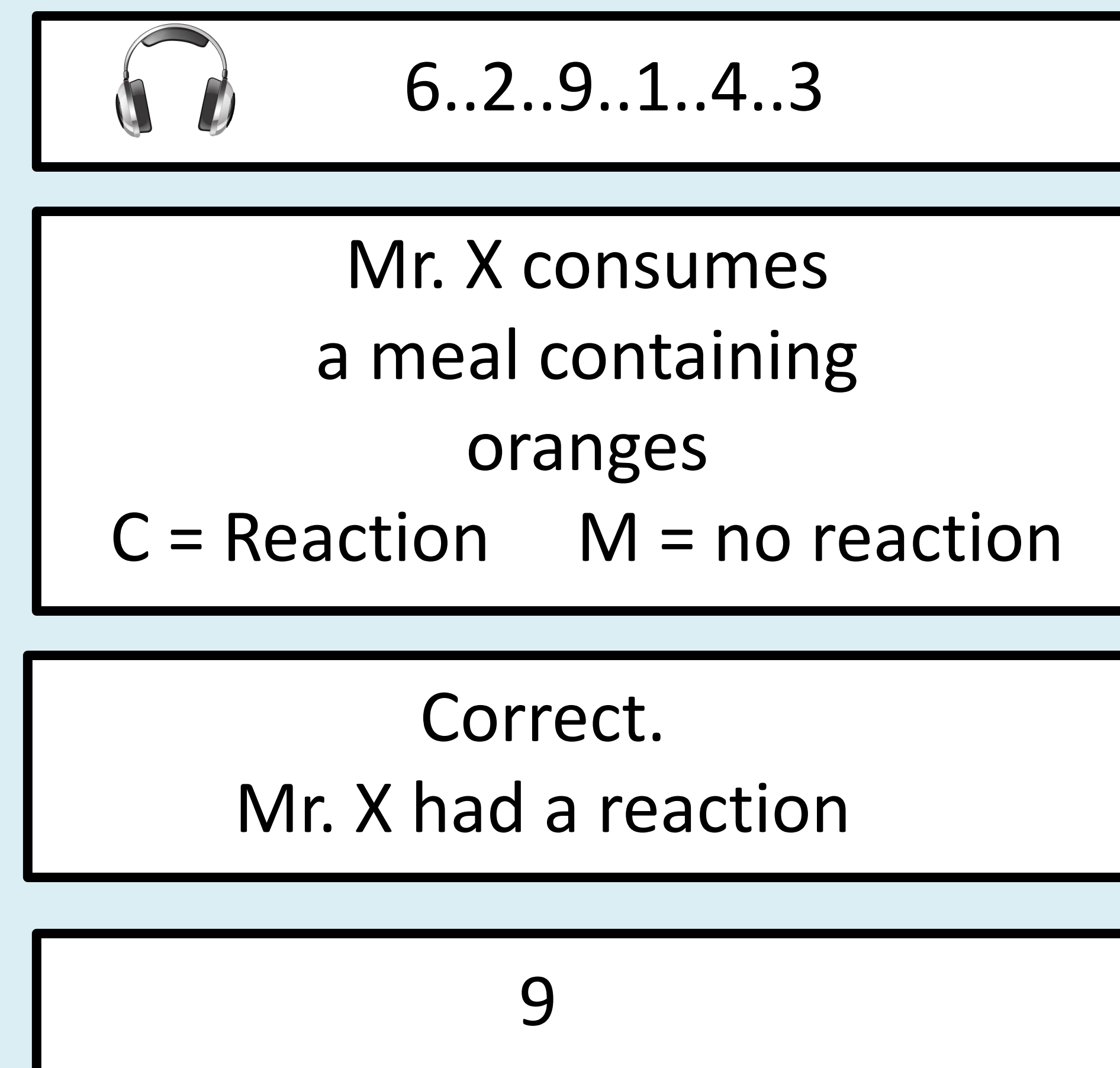


### Background

If consuming icing (I) makes Mr.X ill, and consuming jam (J) also makes him ill, what will happen if he eats icing and jam (IJ)? *Similarity-based* generalization predicts IJ will cause illness. *Rule-based* generalization, however, might note that Mr. X's response to a food combination is always opposite to his reaction to its components (see Table 1). On this basis, IJ predicts no reaction. **Shanks & Darby (1998)** reported that fast learners show rule-based generalization whilst slow learners show similarity-based generalization. Below, we report the effects of concurrent load, and working memory capacity, on the prevalence of rule-based and similarity-based generalization.

Training			Test		
A+	B+	AB-	A?	B?	AB?
C-	D-	CD+	C?	D?	CD?
E+	F+	EF-	E?	F?	EF?
G-	H-	GH+	G?	H?	GH?
I+	J+		I?	J?	IJ?
		KL-	K?	L?	KL?
M-	N-		M?	N?	MN?
		OP+	O?	P?	OP?

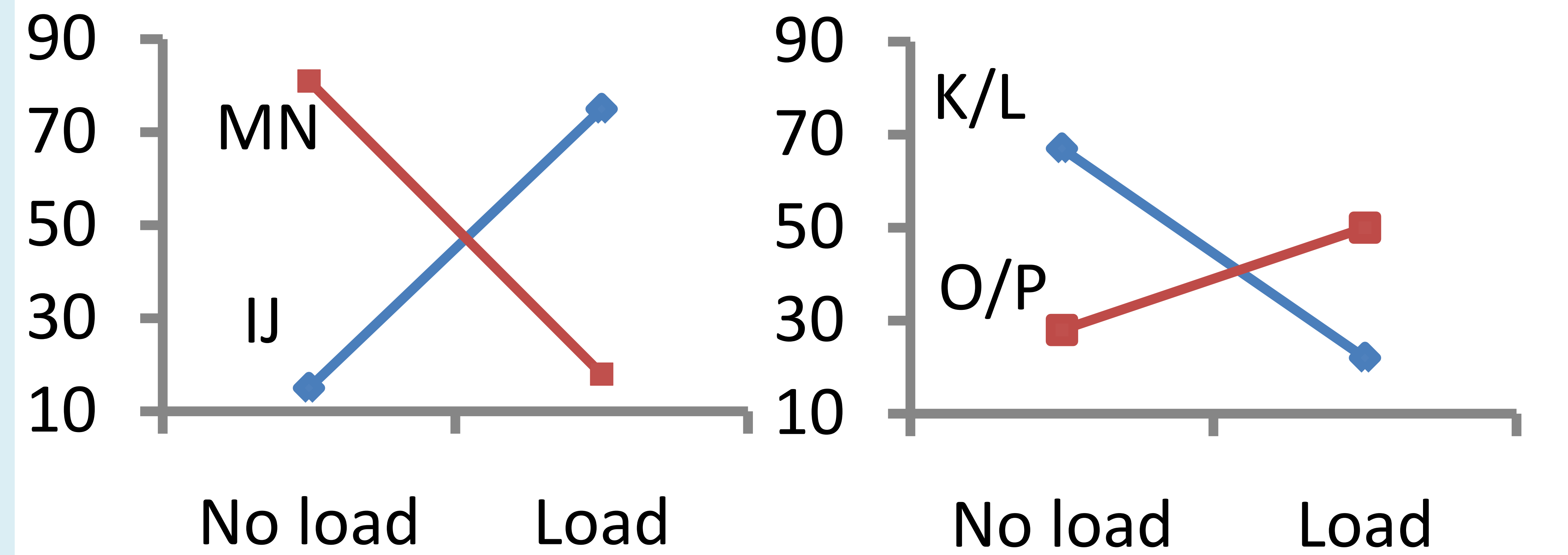
**Table 1:** A-P are foods eaten by fictitious patient Mr. X, + = allergic reaction; - = no allergic reaction. ? = no feedback given. Test phase follows training phase. Trials in each phase randomly ordered.



**Figure 1:** Concurrent load procedure. The correct response to "9" on this trial is "1".

### Exp. 1: Concurrent Load

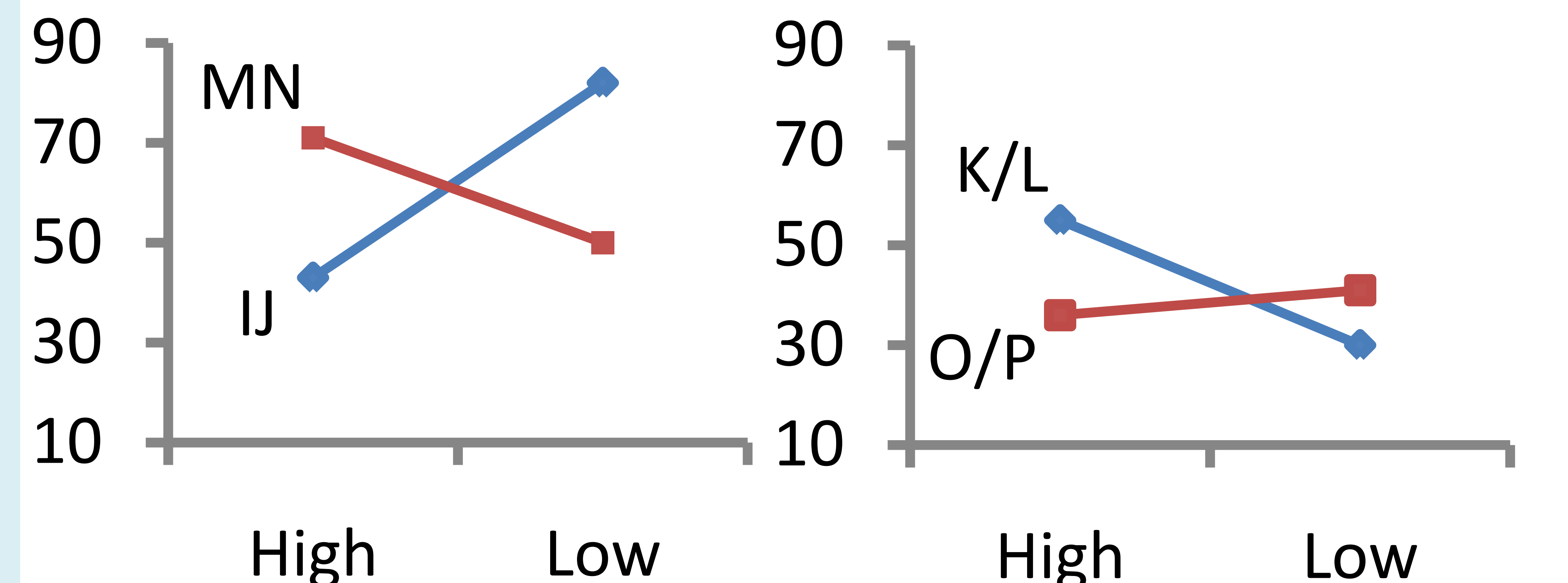
Concurrent load (see Figure 1) was a between-subjects manipulation, and was present throughout training and test. All participants were trained to criterion (86%). Imposition of concurrent load changed responding from rule- to similarity-based (see Figure 2).



**Figure 2:** Percentage allergy responses under load and no load.

### Exp. 2: Working memory capacity

No concurrent load. All participants received 8 blocks of training trials. Working memory capacity was measured by OSPAN (Turner & Engle, 1989). High >30, Low <16. High OSPAN show rule-based generalization; low OSPAN show similarity-based generalization (see Figure 3)



**Figure 3:** Percentage allergy responses for high and low WM capacity.

**Concurrent working memory load, and low OSPAN, were associated with similarity-based generalization. High OSPAN and absence of concurrent load were associated with rule-based generalization. These results are consistent with inferential and hybrid, but not simple associative, accounts of human contingency learning.**