Appendix D

Instructions (Including an Example) for the Explain Similarity

Task for a Same and a Different Pair

Same Pair

   Verbal instructions. "Even though the first problem was a

mixture problem and the second one was a distance problem, there

is a certain way in which they are the same. This next page is

a sample of how someone could explain how they are the same."

(Experimenter hands participants the following written sample).

   Sample explanation. "In problem B, the speed of the second

plane is the weighted average of two other rates, the speed of

the first plane before and after the engine trouble. In problem

A, the proportion of brown rice in the combined mixture is also

the weighted average of two other rates, the proportions of

brown rice in the two initial mixtures."

   "In both of these problems, we are given the two rates that

go into the average rate, and we are asked to find the average

rate by using a weighted average formula. Therefore, in terms

of what we are given, and what we are to find, these two

problems are the same."

   Continuation of verbal instructions. "As this explanation

says, these problems are the same in the sense that you are

looking for the same thing – a final rate. Do you see what the

explanation means by two initial rates being combined into a final rate?"

Different Pair

Verbal instructions. "Besides the fact that one of these problems is a mixture problem and the other is a distance problem, these two problems are also different from each other in another way. This next page is a sample of how someone could explain how they are different."

(Experimenter hands participants the following written sample).

Sample explanation. In problem B, the speed Hillary traveled is the weighted average of two other rates, the speed that Bill traveled for the first and the second parts of the trip. In problem A, the proportion of fat in the combined quantity is also the weighted average of two other rates, the proportions of fat in the two initial quantities.

However, in problem A we are given the two rates that go into the average rate, and we are asked to find the average rate by using a weighted average formula. But, in problem B we are given one of the initial rates and the weighted average rate, and we are asked to find the other initial rate. Therefore, in terms of what we are given, and what we are to find, these two problems are different.

Continuation of verbal instructions. "As this explanation says, these problems are different in the sense that you are not

looking for the same thing. In the first problem you are looking for a final rate, but in the second problem you are looking for one of the initial rates that are combined with, or averaged into, the final rate. Do you see what the explanation means by two initial rates and a final rate in these problems?"