

## Collaborative Research Across Alternate Universes

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Universe Prime

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Much has been said about the value of encouraging collaboration between researchers in different fields. (Pollack and Chase 2000) The value of encouraging collaboration between researchers in different universes has been considerably less studied. In part this has been because of the seeming impossibility of this task, and in part due to a serious lack of creativity within the scientific community. Nonetheless, as inter-universe communication becomes easier and easier, through kinetic-quantum hypertunneling string theoretical application of J.S. Bell's theorem on nondeterministic turing machines via the ratiomorphic apparatus, we begin to be faced no longer with the question "How?" but instead "Huh?"

In this paper, we present an early case study conclusively demonstrating the potential of inter-universe collaboration. We also present some potential pitfalls in its application.

In order to learn the effects of the amount of differences between two Universes, we compared between two similar universes (Universe and Universe Prime), and two rather different universes (Universe and Bizarro Universe).

### **Research Literature**

One of the first ways that inter-universe communication might be particularly fruitful is by allowing access to the writings of some of science's most brilliant thinkers under varying circumstances.

In some cases, the differences between different universes were disappointingly small. Take, for example, Cognitive Psychologist Jim Greeno. Greeno's theories had almost word-for-word agreement in all three universes, although they went by strikingly different names – "Situationalism" on Universe (Greeno 1988a), "Cognativity" on

Universe Prime (Greeno 1988b), and “JIM GREENO NEEDS PANTS THEORY” on Bizarro Universe. (Greeno 1988c)

In other cases, the variation was clearer and provoked new consideration of an important researcher’s ideas. One particularly illuminating example exists in the case of the developmental psychologist Jean Piaget. For example, in Universe, during his famous debates with Noam Chomsky in 1980 (Piattelli-Palmarini 1980), Piaget said the following statement in response to Chomsky’s theory of innate language processing:

“All the facts that you want to explain by innate principles could be explained equally well by the constructions of sensori-motor intelligence.”

Piaget’s comments were almost word-for-word identical in Universe Prime:

“All those facts that you would explain by innate principles could be explained equally well by constructions of sensori-motor intelligence.”

Piaget’s comments were, on the other hand, intriguingly different in Bizarro Universe:

“I am Morgtoth, Barbarian King of Switzerland. Bow before me, foolish nativist, or I shall drink from your skull.”

### **Cross-Universe Experimental Design**

Another area where cross-universe research might be of considerable value is in experimental design. This is because the same experiment can be conducted multiple times with all factors, including the specific subject, truly identical, allowing the only variation to be the condition the subject is placed in. For this to be useful, however, it would have to be the case that the exact same action performed in different universes would have the exact (or very nearly exact) same results.

In order to test whether this holds true, we elected to replicate a simple experiment which was highly influential within Universe’s scientific history. In Universe, at the dawn of modern psychology, Karl Lashley demonstrated that after ablating (destroying a specific region via surgical lesion) a rat’s brain, it was substantially less able to run a maze in order to obtain cheese. (Lashley 1929)

Duplicating the methodology of Lashley’s original experiments, we had a research assistant in each universe take the same two rats, one with an ablated brain, and the other without brain ablation, and place them in a maze, with cheese at the end. We gave each rat twenty trials starting in the same position in the same maze, in order to determine the effectiveness of learning, and used time to reach cheese as our measure. In order to eliminate experimenter effects, we used the same individual, Garren Gergle, to ablate the rat’s brain.

We obtained two effects in our study, one gratifying and the other rather surprising. The more gratifying result was that there was no significant difference in the time taken for each rat to reach the cheese in any of the three universes, in both the ablated and non-ablated conditions ( $F(2,1)=0.242$ ,  $p>0.10$ ), ( $F(2,1)=0.219$ ,  $p>0.10$ ).

There was also a significant main effect for condition in each of the three universes, with the ablated rats taking significantly longer to reach the cheese than the non-ablated rats. ( $F(3,1)=8.12, p<0.01$ )

There was an added finding, however, which may have some implications for cross-universe research. On Universe and Universe Prime, the procedure of ablating the rat occurred routinely and with no undue side-effects. However, when Mr. Gergle attempted to ablate the rat on Bizarro Universe, it became highly enraged, grew to eight feet in size, and quickly killed and ate him. This was a rather unexpected event, and leads to the conclusion that a high degree of similarity between the two universes is necessary for a valid multi-universe study.

	Universe Prime	Universe	Bizarro Universe
Jim Greeno	X	X	X
Jim Greeno's Pants	X	X	
Jean Piaget	X	X	
Morgoth the Fearsome			X
Giant Carnivorous Rats			X

Table 1: The presence of various elements in the three Universes.

### Determining the relative similarity between Universes

Our experiment demonstrated the need for a metric for similarity between universes. After proposing, examining, and testing an extensive number of possible metrics, we have found one that appears to have excellent predictive power – the existence of Canadian Prime Minister Jean Chretien. In a survey of 600 universes, the existence of Jean Chretien is quite negatively correlated ( $r = -0.98, p<0.05$ ) with the presence of giant carnivorous rats which eat graduate students.

We hope, in future research, to determine whether Jean Chretien predicts other factors important to experimentation – such as giant carnivorous hamsters, giant carnivorous bunny rabbits, and giant carnivorous college sophomores. Early results unfortunately appear mixed, as one of our researchers was in fact devoured by a giant carnivorous college sophomore in a universe where Jean Chretien was Prime minister of Canada, albeit a Canada which stretched all the way to New Orleans.

Nonetheless, with attention to these factors, we expect cross-universe experimentation to become an important part of the modern scientific method.

### WORKS CITED

Greeno, J. (1988) The situationalist perspective. *Educational Researcher*, (16) 4, p. 10-14.

Greeno, J. (1988) The cognativity perspective. *Educational Researcher*, (16) 4, p. 10-14.

Greeno, J. (1988) JIM GREENO NEEDS PANTS – a perspective. Educational Researcher, 16 (4), p. 10-14.

Lashley, K. S. (1929) Brain Mechanisms and Intelligence. Chicago: University of Chicago Press. Universe.

Piattelli-Palmarini, M. (ed) (1980), Language and Learning: the Debate between Jean Piaget and Noam Chomsky, Harvard University Press

Pollack, B. and Chase, B. (2000) PROXIMITY: An update and expansion of the PROXTIME computer program. Behavior Research Methods, Instruments & Computers Vol 32(3), Aug 2000, 432-435.