

## **UC Merced**

### **Proceedings of the Annual Meeting of the Cognitive Science Society**

#### **Title**

Does the K-12 practice of mixing pictures and graphs contribute to students' 'graph-as-picture' misconceptions?

#### **Permalink**

<https://escholarship.org/uc/item/2jq125tt>

#### **Journal**

Proceedings of the Annual Meeting of the Cognitive Science Society, 31(31)

#### **ISSN**

1069-7977

#### **Authors**

Cox, Richard  
Garcia, Grecia Garcia

#### **Publication Date**

2009

Peer reviewed

# Does the K-12 practice of mixing pictures and graphs contribute to students' 'graph-as-picture' misconceptions?

**Grecia Garcia Garcia**  
University of Sussex

**Richard Cox**  
University of Sussex

**Abstract:** Graphs are often introduced to young students in a form (e.g. pictograms) that conflates them with pictures. Numerous examples from the UK National Curriculum illustrate this practice (Garcia-Garcia & Cox, 2008). We criticize this approach and suggest that it may negatively impact students' acquisition of diagram comprehension skills. The graph-as-picture (GAP) misconception (interpreting a diagrammatic representation as a picture) might be an inadvertent consequence. We developed a method for detecting and remediating the GAP misconceptions in the form of an interactive diagram system. Students use a large touch screen to perform a representation decision task and to play an interactive 'racing car' game. The student's finger interactions with the on-screen 'car' are dynamically coupled to an adjacent speed/distance graph. Students are encouraged to experiment (e.g. by varying their 'driving' speed on straight track sections and corners) and to observe the concomitant changes on the speed-distance graph.