

# UC Merced

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

### Title

Conceptual Analysis of Analogical Transfer in Common Programming Languages

### Permalink

<https://escholarship.org/uc/item/9z0408kn>

### Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 47(0)

### Authors

Owen, Rosalind

Houchins, Jennifer

Matlen, Bryan

et al.

### Publication Date

2025

### Copyright Information

This work is made available under the terms of a Creative Commons Attribution License, available at <https://creativecommons.org/licenses/by/4.0/>

Peer reviewed

# Conceptual Analysis of Analogical Transfer in Common Programming Languages

**Rosalind Owen**

WestEd, San Francisco, California, United States

**Jennifer Houchins**

WestEd, Fuquay Varina, North Carolina, United States

**Bryan Matlen**

WestEd, San Francisco, California, United States

**Elysse Caballero**

WestEd, San Francisco, California, United States

**Kiley McKee**

WestEd, San Francisco, California, United States

**Yvonne Kao**

WestEd, San Francisco, California, United States

## Abstract

Analogical transfer is well studied, but much less is known about how students transfer within specific domains. Computer science presents an opportunity to study such transfer, as students often transition from block-based (e.g., Scratch) to text-based (e.g., Python) programming languages. As an early step in understanding programming transfer, we present a conceptual analysis that predicts when students may be aided by analogical supports when transferring from Scratch to Python. We are specifically guided by Structure Mapping theory, which states analogy is a process of aligning objects and relations based on their common structure (Gentner, 1983, 2010). Much research has found that surface similarity influences transfer; thus, we categorized various programming concepts (iteration, booleans, etc.) based on their perceptual similarity. Further, we make predictions about where and how progressive alignment (Kotovsky & Gentner, 1996) can be used to facilitate relational understanding. This analysis sets the stage for future experimental work.