Representational modes and their effects on written signs

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NOTATIONS FOR NUMBERS represent in a fundamentally different manner from writing for non-numerical language: numbers *instantiate* quantity, while signs for language *signify* through resemblance and convention. Simply, three cuneiform wedges *are* three, while a picture of a head means something related to what it looks like—for example, a man, a head, a face, etc. Because they instantiate quantity, notations for numbers are unambiguously meaningful without phonetic specification, and in fact work better as numbers without the visual complexity it would add, the difference between *7* and *seven*. These qualities enable numerical notations to cross linguistic and cultural barriers with unusual ease and speed, often with little to no change in their form or meaning. In comparison, writing for language is generally ambiguous until it is specified, typically by incorporating strategies like identifying the type of word (determinatives) or providing clues to its pronunciation (phonography). Not all writing systems incorporate such strategies and rely instead on memorisation and interpretation. In writing systems that do incorporate strategies for specificity, signs increase in visual complexity, and crossing linguistic and cultural barriers means they must represent new sounds and different meanings, with both having significant potential to alter form and meaning. These differences in representational modes are ultimately traceable to neurofunctional and behavioural aspects of the cognitive systems for numbers and writing.