THE LINGUISTIC RELATIVITY OF PROGRAMMING LANGUAGES
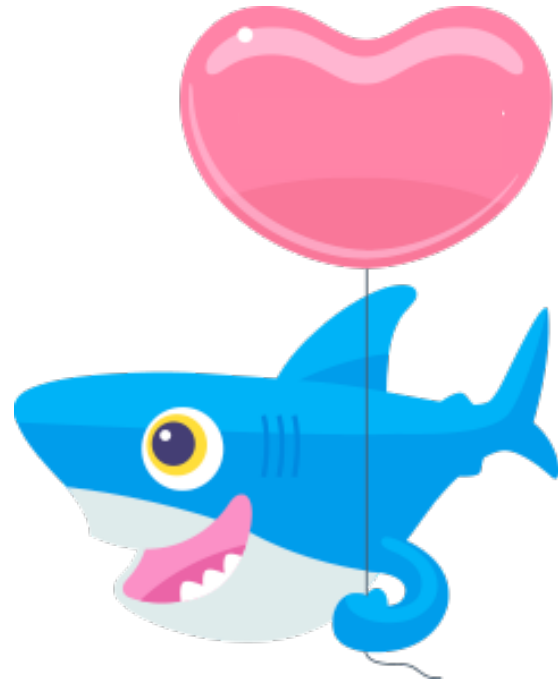
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PolyConf 2016

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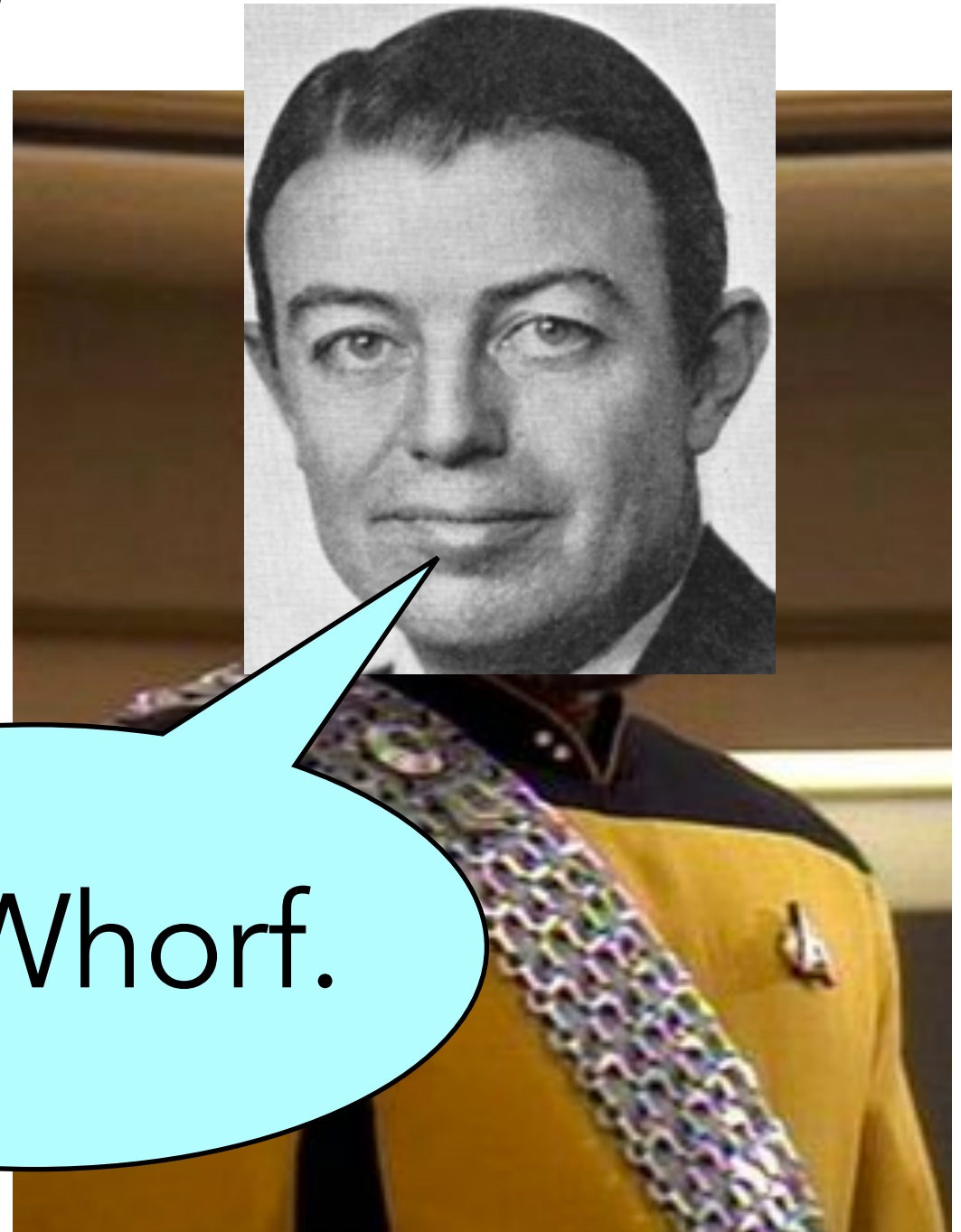 zeigenvector

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1. Linguistic Relativity
2. … and Programming Languages?
3. Previous allusions
4. How it applies
5. Implications

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SAPIR-WHORF HYPOTHESIS

The languages you speak {determine | influence} the way you think.

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SAPIR-WHORF HYPOTHESIS

The languages you speak {~~determine~~ | influence} the way you think.

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SAPIR-WHORF HYPOTHESIS

Green

Blue

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SAPIR-WHORF HYPOTHESIS

Grue

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But what about
CODE
?????????????

<u>Proposal</u>: The programming languages we know strongly influence the way we think about programming.

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Programming languages **create** and **manipulate** the space, rather than just describe it.

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"Programming languages, because they were designed for the purpose of directing computers, offer important advantages as **tools of thought**."

Kenneth Iverson, "Notation as a Tool of Thought" (1979)

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BLUB PARADOX

Some programming languages are more powerful than others.

Paul Graham, "Beating the Averages" (2003)

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BLUB PARADOX

"Some programming languages are more powerful than others."

Weak
language

Blub (average)

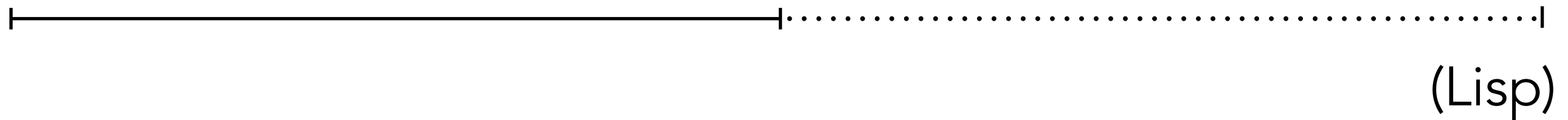# BLUB PARADOX

"Some programming languages are more powerful than others."

Weak
language

Blub (average)

Super strong
language!

(Lisp)

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BLUB PARADOX

"I look at [Python, Java, C, and Perl]. How can you get anything done in them, I think, without macros?"

Paul Graham, "Beating the Averages" (2003)

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BLUB PARADOX

"They're satisfied with whatever language they happen to use, because it **dictates** the way they think about programs."

Paul Graham, "Beating the Averages" (2003)

BLUB PARADOX

"I know this from my own experience, as a high school kid writing programs in Basic. That language didn't even support recursion… but I didn't miss it at the time. **I thought in Basic.**"

Paul Graham, "Beating the Averages" (2003)

SCARRED FOR LIFE?

"It is practically impossible to teach good programming to students that have had a prior exposure to BASIC: as potential programmers they are **mentally mutilated beyond hope** of regeneration."

Edsger Dijkstra, "How do we tell truths that might hurt" (1975)

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We are influenced by the **constructs** and **idioms** of the most powerful programming language we **know**, not the languages themselves, or the language we are using at the time.

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1. We can learn more (powerful) programming languages and how to program in them idiomatically.

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HUMANS CAN LEARN

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loops

loops
list comprehension

loops
list comprehension

map

2. We can implement the constructs of more powerful languages in whatever language we use.

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"We should now think of a language design for being a pattern for language designs, a tool for making more tools of the same kind."

Guy Steele, "Growing a Language"

CODE CAN MAKE THINGS

```
_.map(array, function(el) {
    return el + 1;
})

array.map(function(el) {
    return el + 1;
})
```

"Sweet.js brings the hygienic macros of languages like Scheme and Rust to JavaScript. Macros allow you to…**craft the language you've always wanted.**"

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The future can be now (kinda).

3. Programming languages are synthetic and can change.

loops

loops
map

loops
map
generators

loops

map

generators

~~array comprehension~~

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"Languages that can't easily grow will die."

Guy Steele, "Growing a Language"

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MONOCONF

Learn new languages!
Find cool things!
Bring them back!
Share!

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Slides: jenna.is/at-polyconf

Blog Post: bit.ly/ling-rel-prog

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Thanks!

↑
Me