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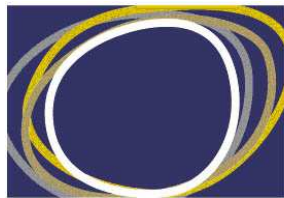
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More Individual Differences in Language Attainment

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Northumbria Research Conference

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Arts & Humanities
Research Council



Conventional wisdom:

All learners attain (more or less) the same grammar

- “.....children in the same linguistic community all learn the same grammar.” (Crain & Lillo-Martin 1999:9)
- “...children are exposed to different samples of utterances but converge on the same grammar.”(Seidenberg 1997:1600)
- “Language learning cannot be by trial and error, otherwise children would not all converge on the same grammar.”(Hermon 2002)

Studies (adult participants)

Education related differences

- Polish genitive masculine inflection (Dąbrowska 2008)
- Polish dative inflections (Dąbrowska 2008)
- Complex English syntactic structure - *complex NP, tough movement, parasitic gaps* (Dąbrowska 1997, Chipere 2001)
- English passive (Dąbrowska & Street 2006)
- Universal quantifiers (Street & Dąbrowska 2010)

Studies (child participants)

- Universal quantifiers (Crain et al. 1996)
 - Children aged: 3;5 - 5;10
 - Exp 2 comprehension - 88%
 - Exp 3 production - 98%
- Passives (Pinker et al. 1987)
 - Children aged: 3;10
 - Exp 1 comprehension - at ceiling with nonce words in passive
 - production of passive with nonce verbs only encountered in active

English passives & universal quantifiers (Street & Dąbrowska 2010)

Main Aims

- Provide further evidence of individual differences in native language attainment
- Identify possible reasons for such differences
 - differences in quantity and quality of linguistic experience

Conditions

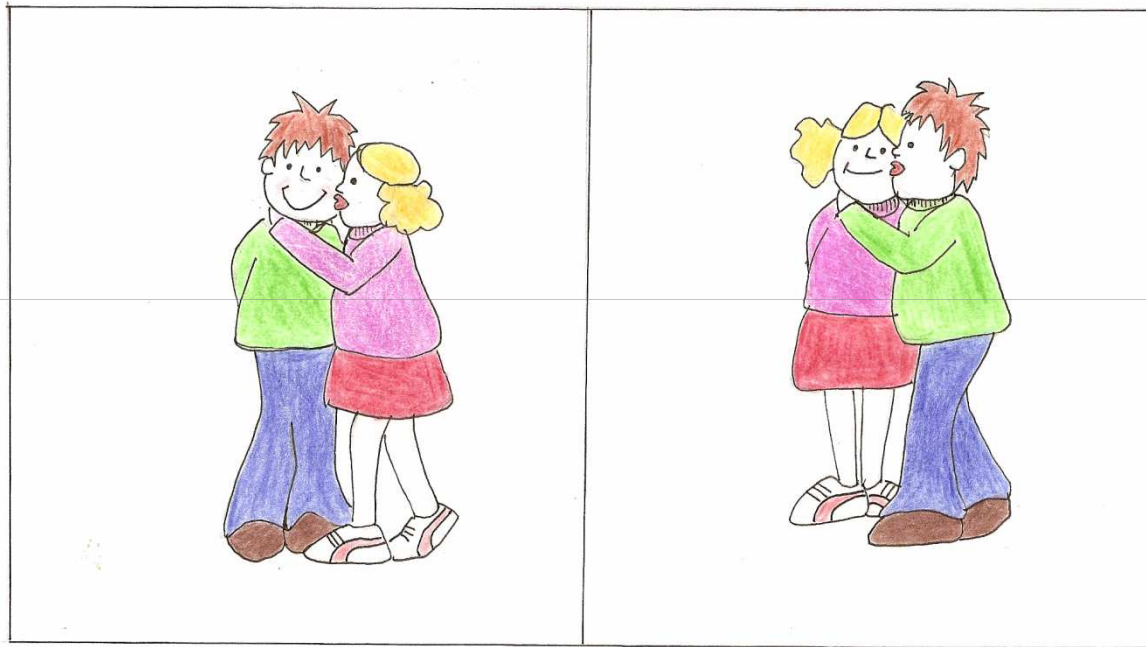
- Passives
 - *The boy was kissed by the girl*
 - *The girl was kissed by the boy*
- Q-*is*
 - *Every fish is in a bowl*
- Q-*has*
 - *Every bowl has a fish in it*
- Active (control)
 - *The boy kissed the girl*
 - *The girl kissed the boy*

Experiment 1: Participants

50 adult native speakers of English

- 19 participants - postgraduate students (HAA - 17 years of formal education)
- 31 participants - shelf stackers, packers, assemblers (LAA - max. 11 years formal education)

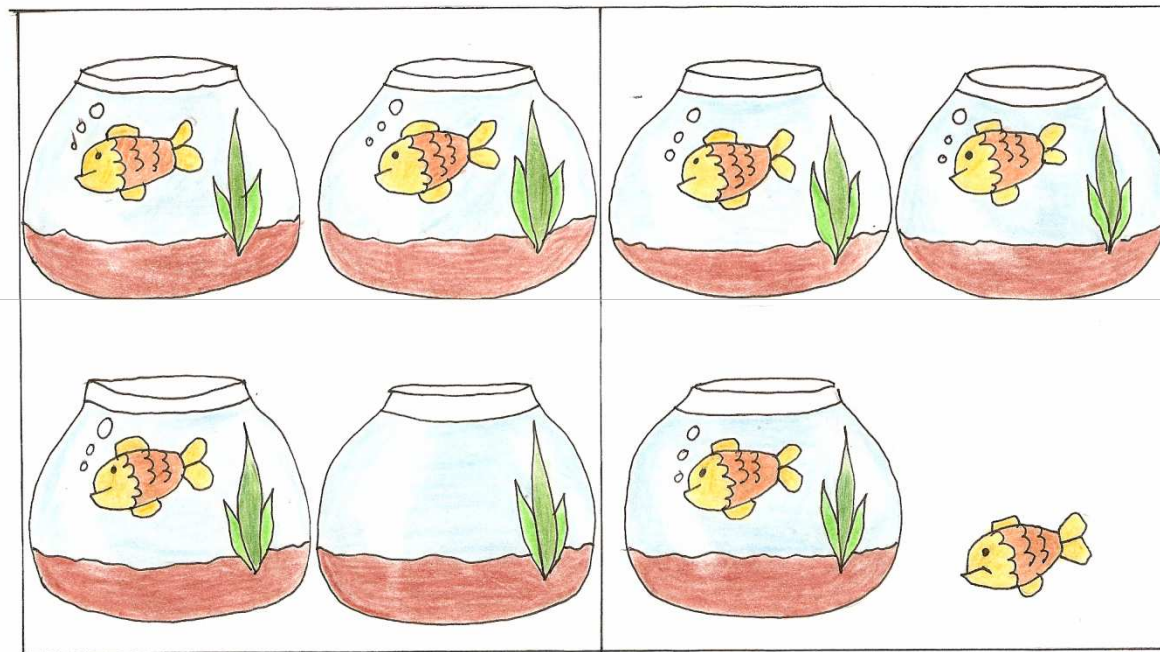
Experiment 1: Materials



The boy kissed the girl/The girl kissed the boy

The boy was kissed by the girl/The girl was kissed by the boy

Experiment 1: Materials

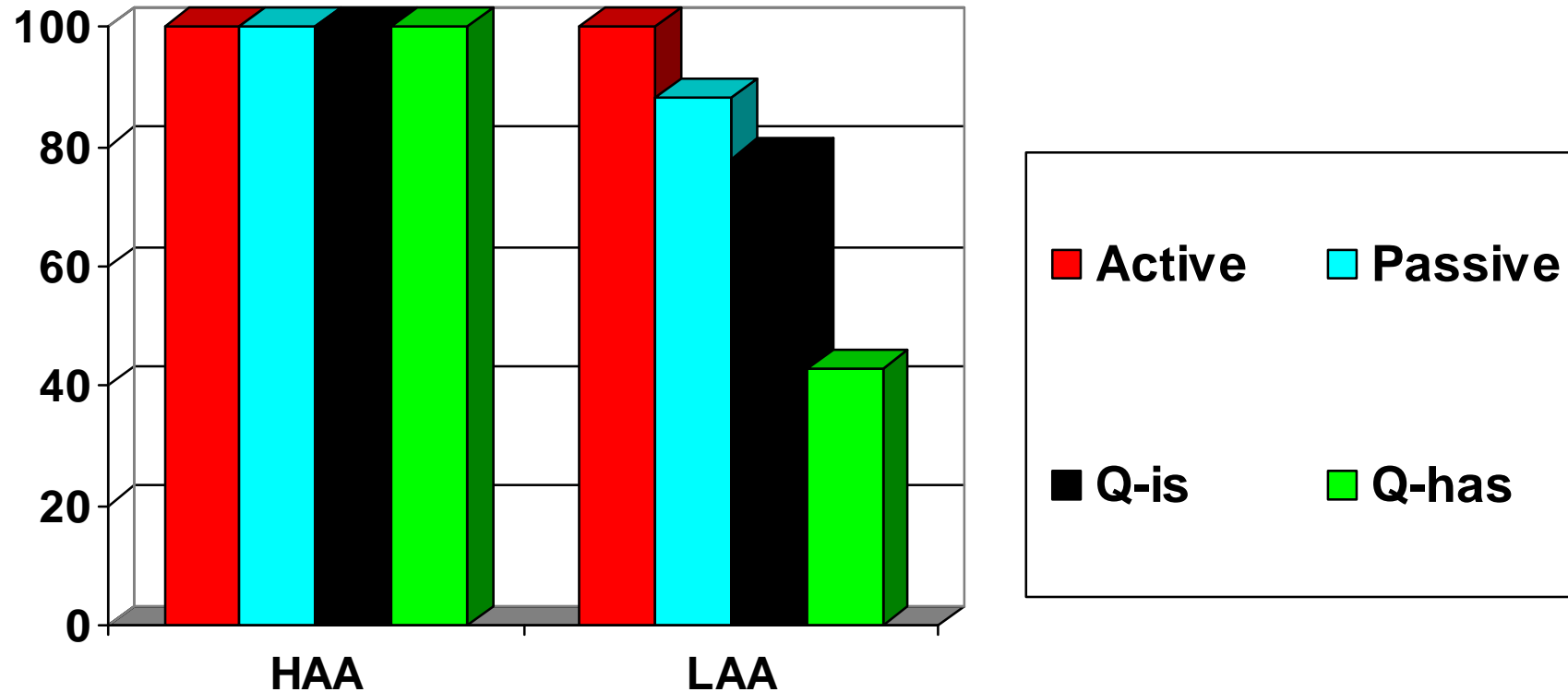


Every fish is in a bowl/Every bowl has a fish in it

Experiment 1: Prediction

- Frequency (BNC)
 - Q-has (*Every NOUN has a NOUN PREP it*): 0 instances
 - Q-is (*Every NOUN is PREP a NOUN*): 8 instances
 - full passives: 5675 instances
 - active transitive: 120,000 instances
- Prediction
 - actives easier than passives
 - passives easier than Q-is
 - Q-is easier than Q-has

Experiment 1: Results



active > passives ($z = -2.62$, $p = 0.026$)

passives > Q-is ($z = -4.28$, $p < 0.001$)

Q-is > Q-has ($z = -4.18$, $p < 0.001$)

Performance v Competence

- Results reflect large (education related) differences in underlying linguistic knowledge NOT performance factors
 - interviews: very informal, plenty of time to answer questions, at place of work/study
 - test-wiseness: evident across conx (LAA at ceiling on actives)
 - easy task: 2-year-olds can do it!

Experiment 2

Training study

- Comprehension of same conx as Exp 1 before and after training (see Chipere 2001)
- Half participants trained on passive, half trained on Q-has

Experiment 2: Prediction

- Training leads to selective improvement in performance
 - Passive group improve on passive but not quantifiers
 - Quantifier group improve on Q-has but not passives
- Quantifier group improve on Q-is?

Experiment 2: Participants

- 54 adult literacy students (Skills for Life)
- 5 levels:
 - 1-3 entry levels - very basic skills
 - Level 1 & 2 - equivalent to GCSE pass/good pass

Experiment 2: Materials

Four versions of test used in Exp 1

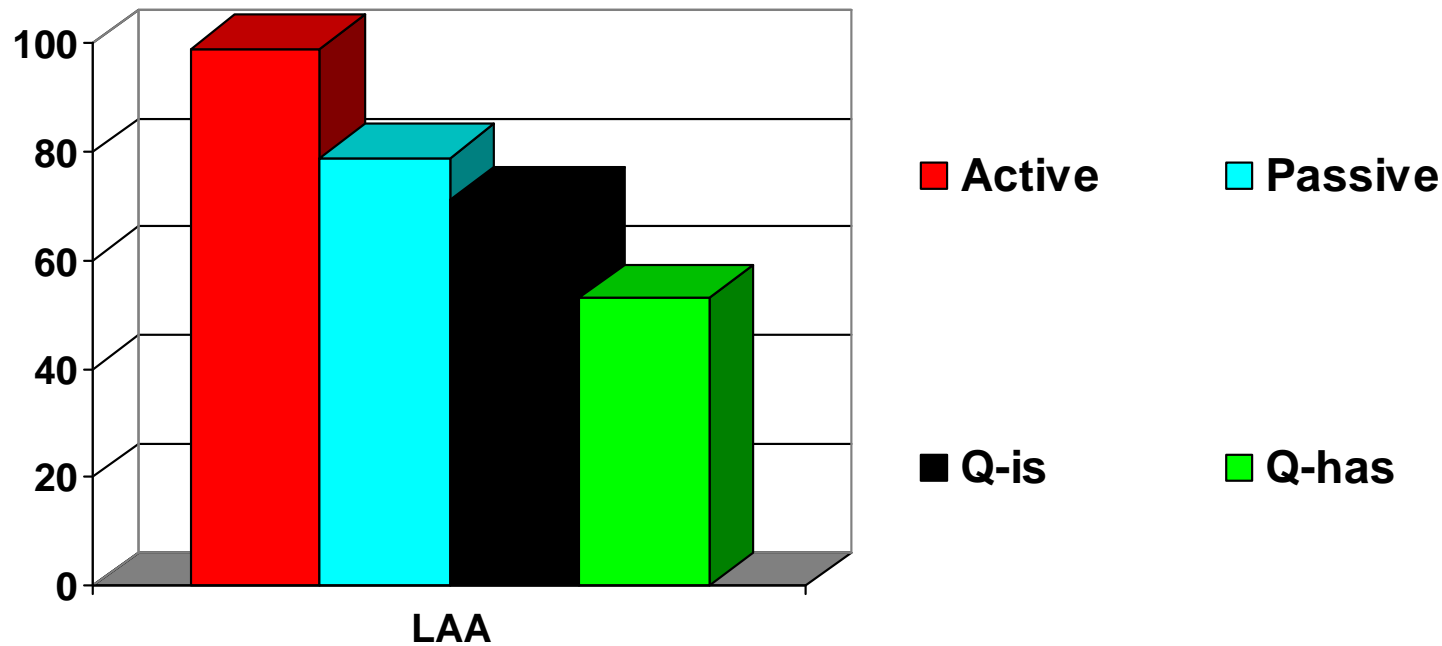
- Version 1 same as Exp 1
- Versions 2, 3 and 4
 - same verbs and universal quantifiers as Exp1 but different NPs

Experiment 2: Procedure

6 stages:

- Pre-test
 - to select low scoring (i.e. 4/6 on three experimental conx) participants
- Training (1 week after pre-test)
- Post-test 1 (immediately after training)
- Post-test 2 (1 week after training)
- Post-test 3 (approx. 12 weeks after training)
- Reading and Need for Cog questionnaire

Pre-test results (N=54)

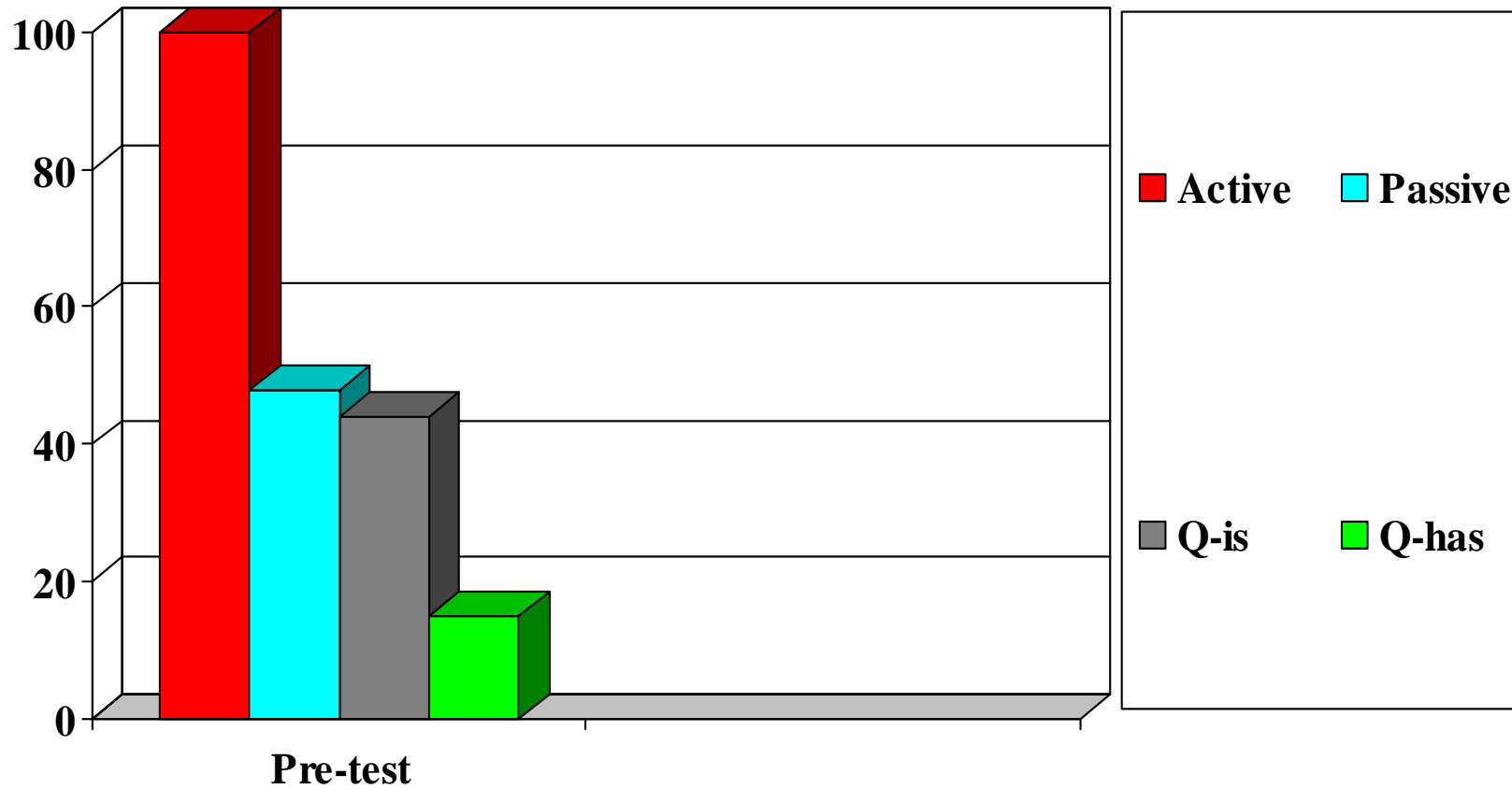


actives > passives: ($z = -4.92$, $p < 0.001$)

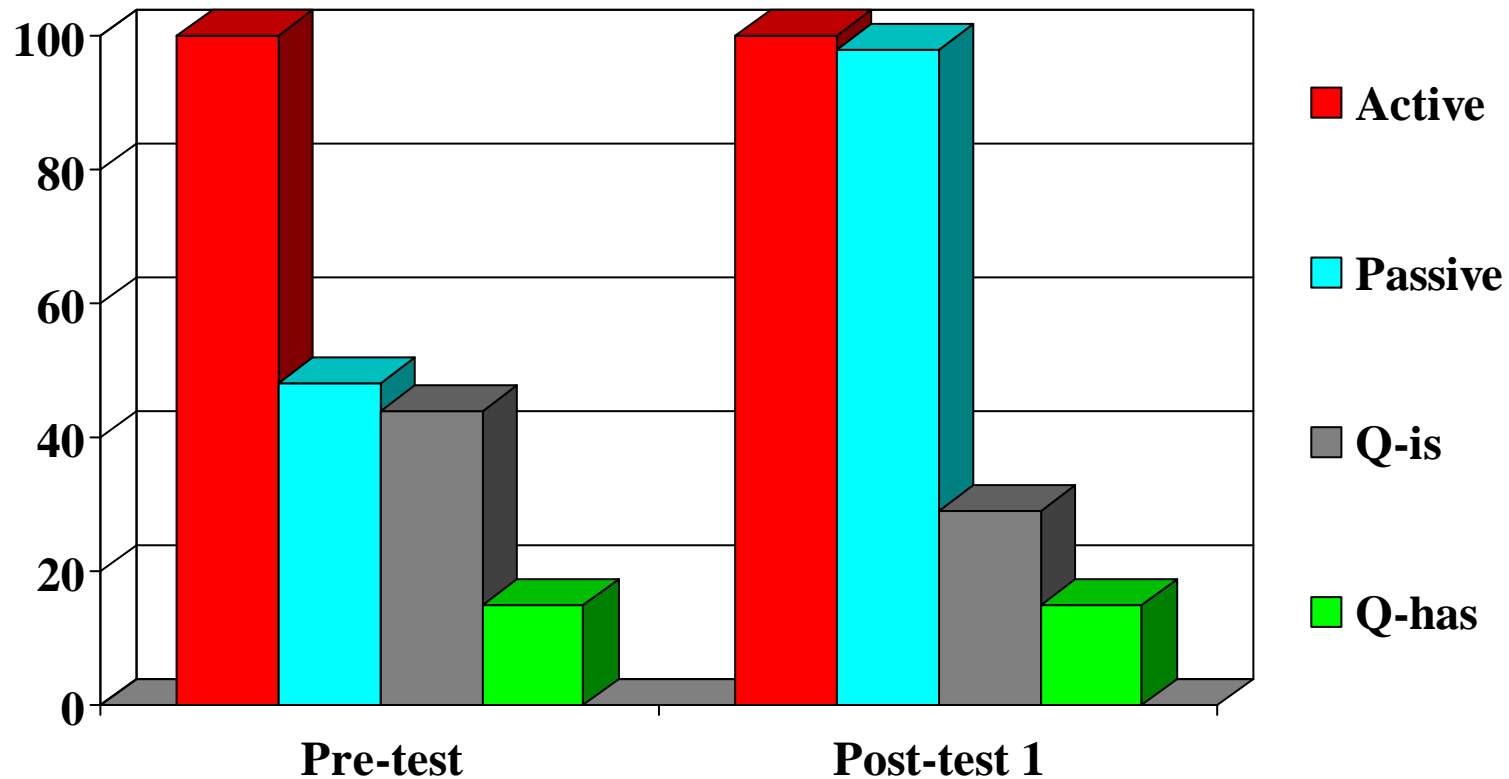
passives > Q-is: ($z = -4.28$, $p < 0.001$)

Q-is > Q-has: ($z = -3.68$, $p < 0.001$)

Post tests: Passive group (N=8)

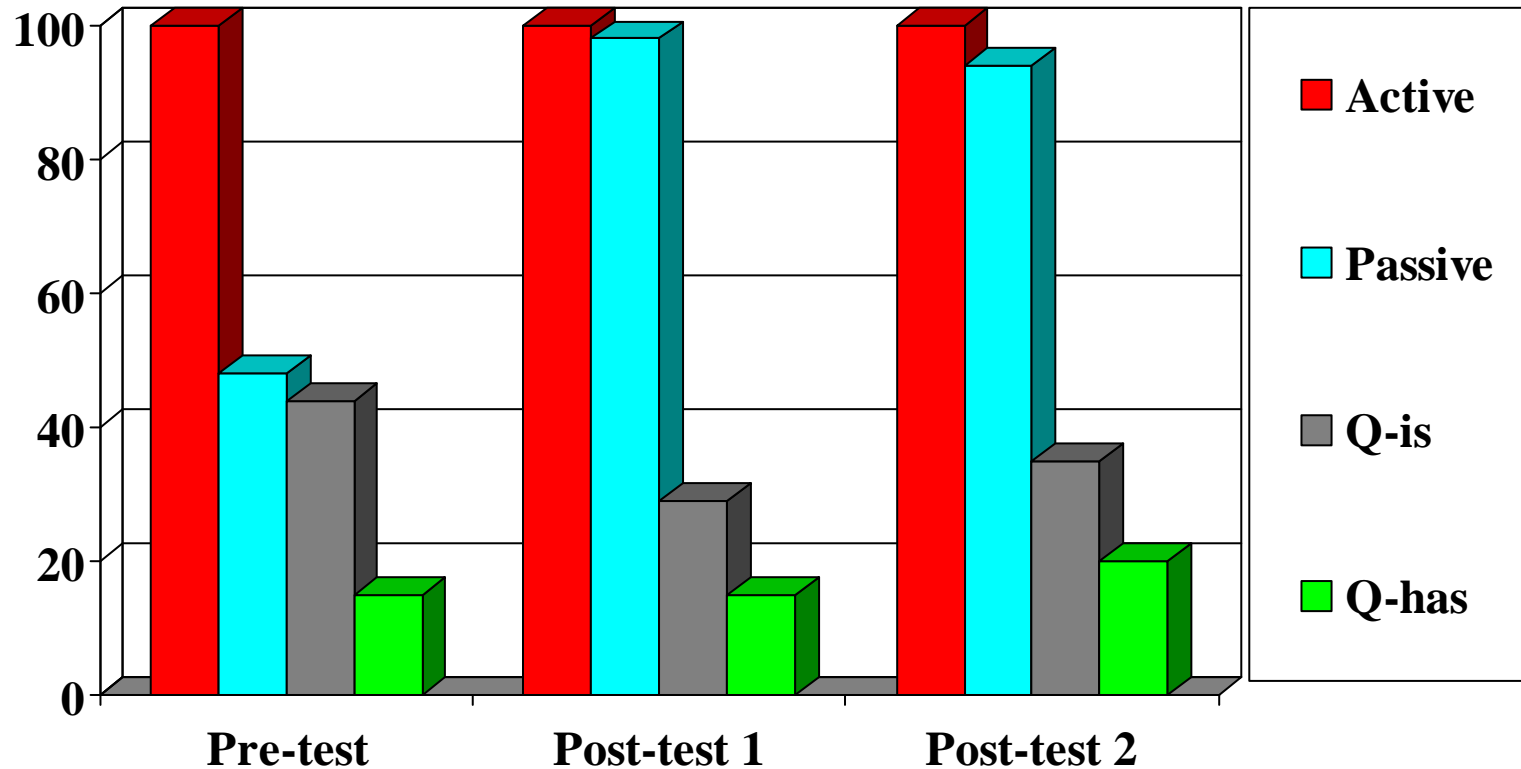


Passive group (N=8)



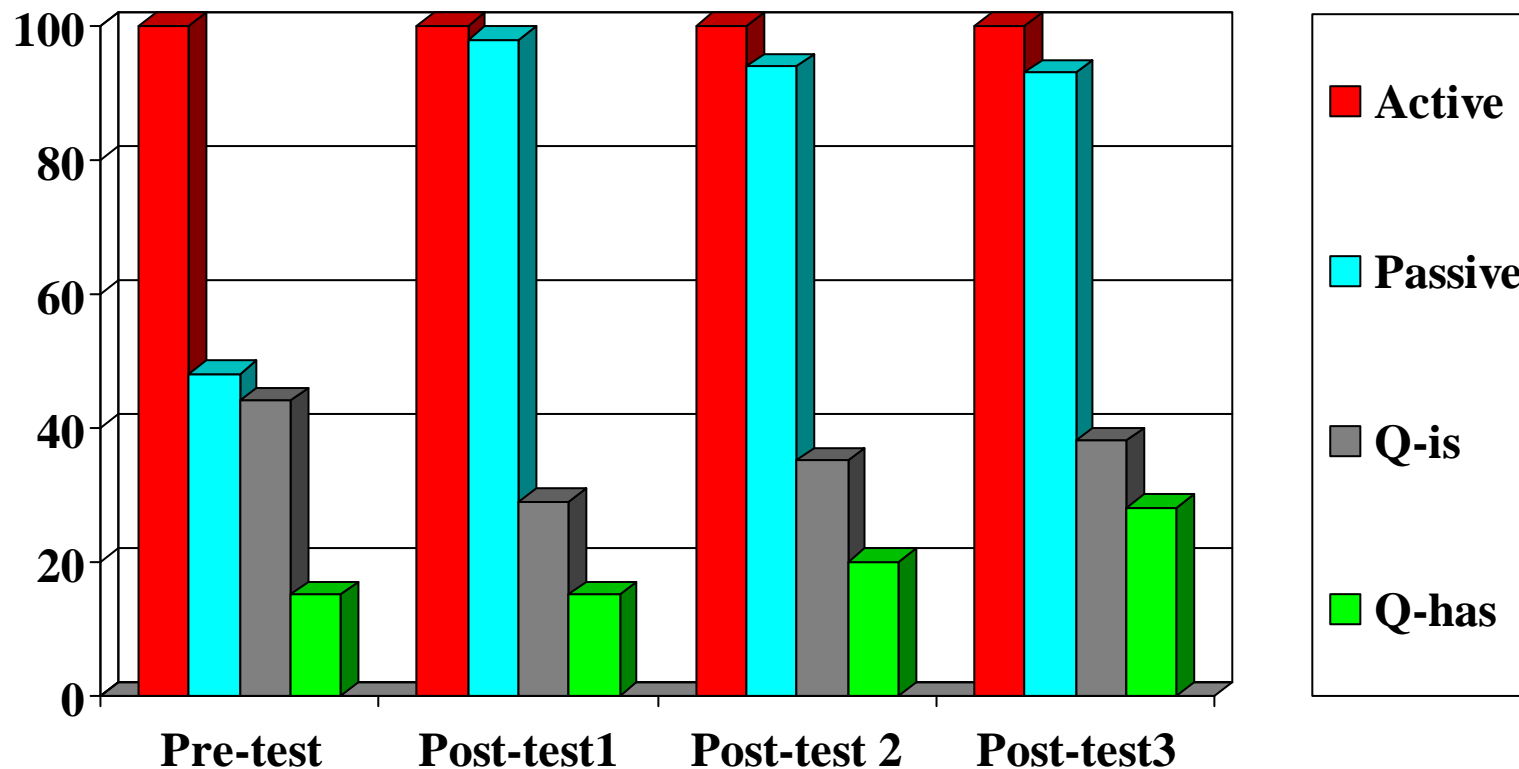
- Actives > Q-is: ($z = -2.53$, $p=0.033$)
- Actives > Q-has: ($z = -2.55$, $p = 0.033$)
- Active - Passive: ($z = -1$, $p=0.951$)

Passive group (N=8)



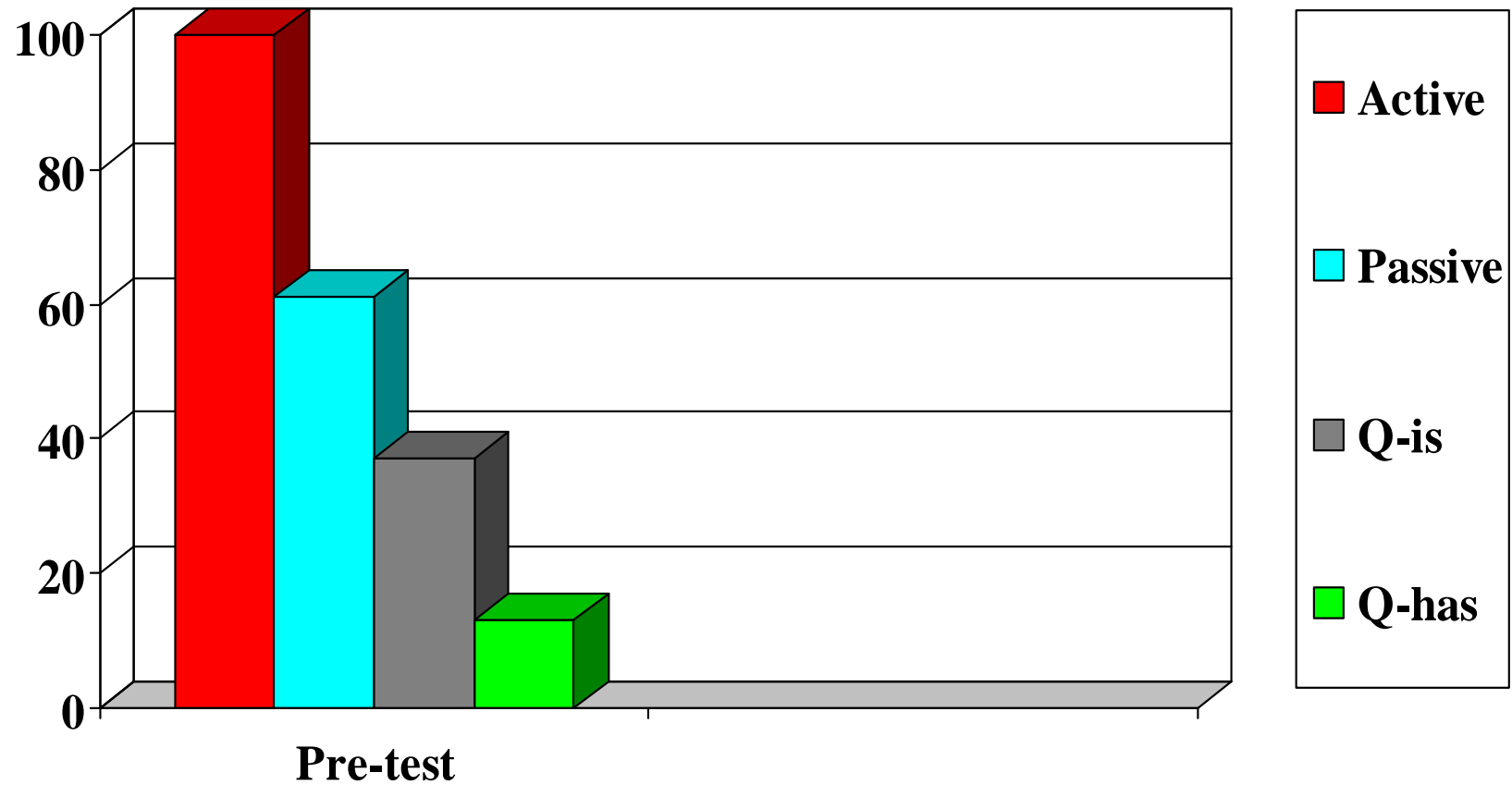
- Actives > Q-is: ($z = -2.53$, $p=0.033$)
- Actives > Q-has: ($z = -2.55$, $p = 0.033$)
- Active - Passive: ($z = -1.73$, $p=1$)

Passive group (N=7*)

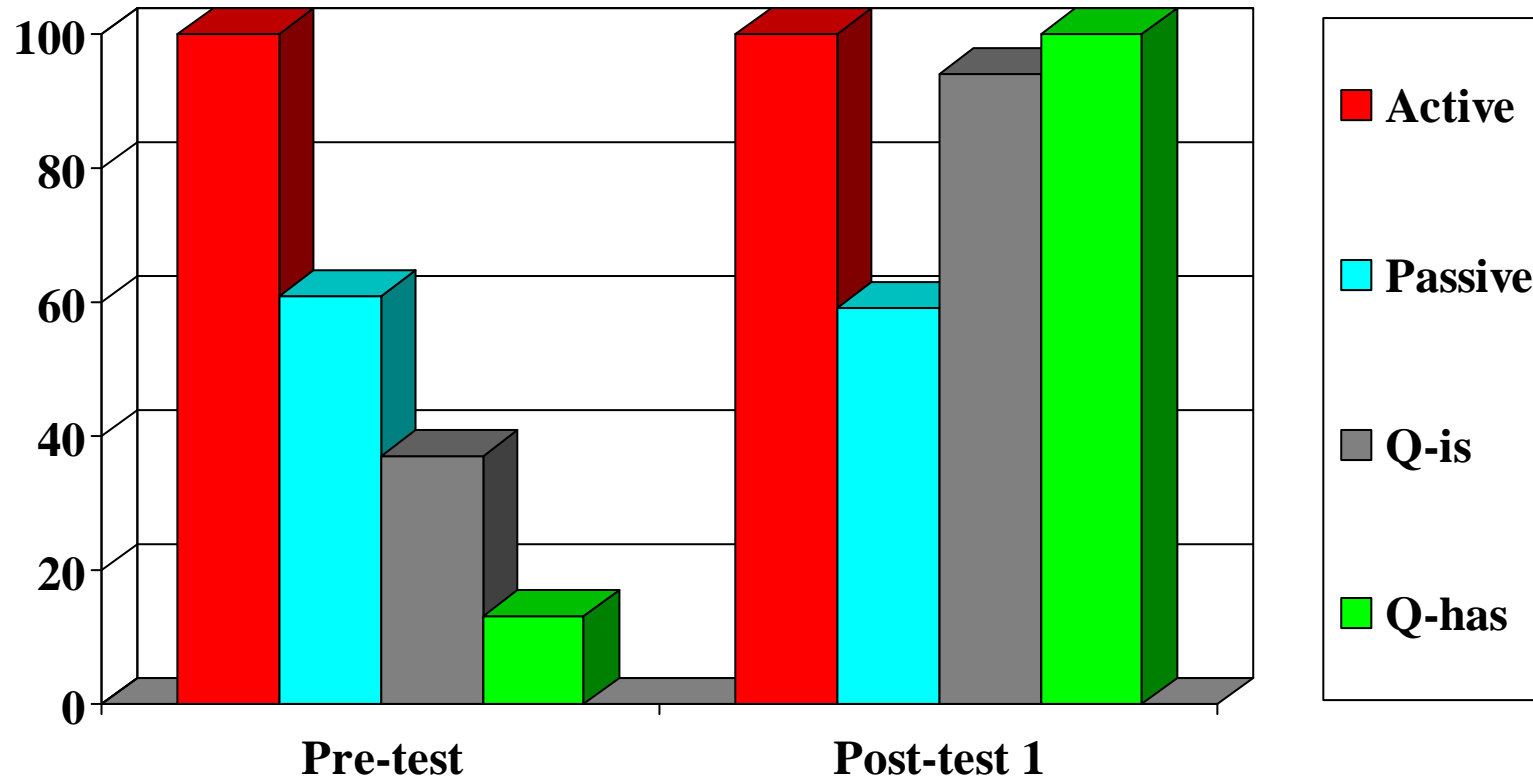


- Actives > Q-is: ($z = -2.41$, $p=0.048$)
- Actives > Q-has: ($z = -2.41$, $p = 0.048$)
- Active - Passive: ($z = -1.73$, $p=1$)

Quantifier group (N=9)

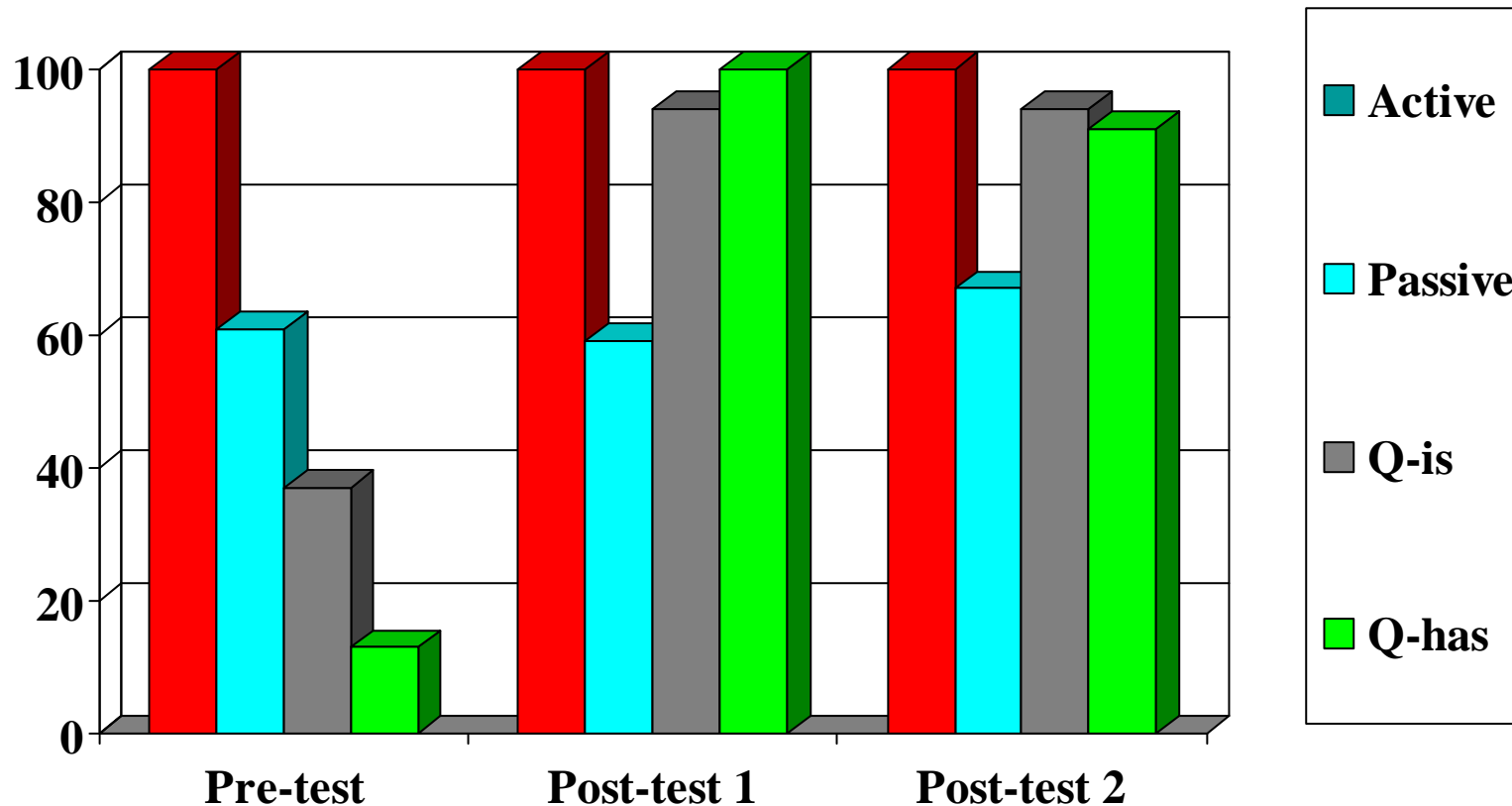


Quantifier group (N=9)



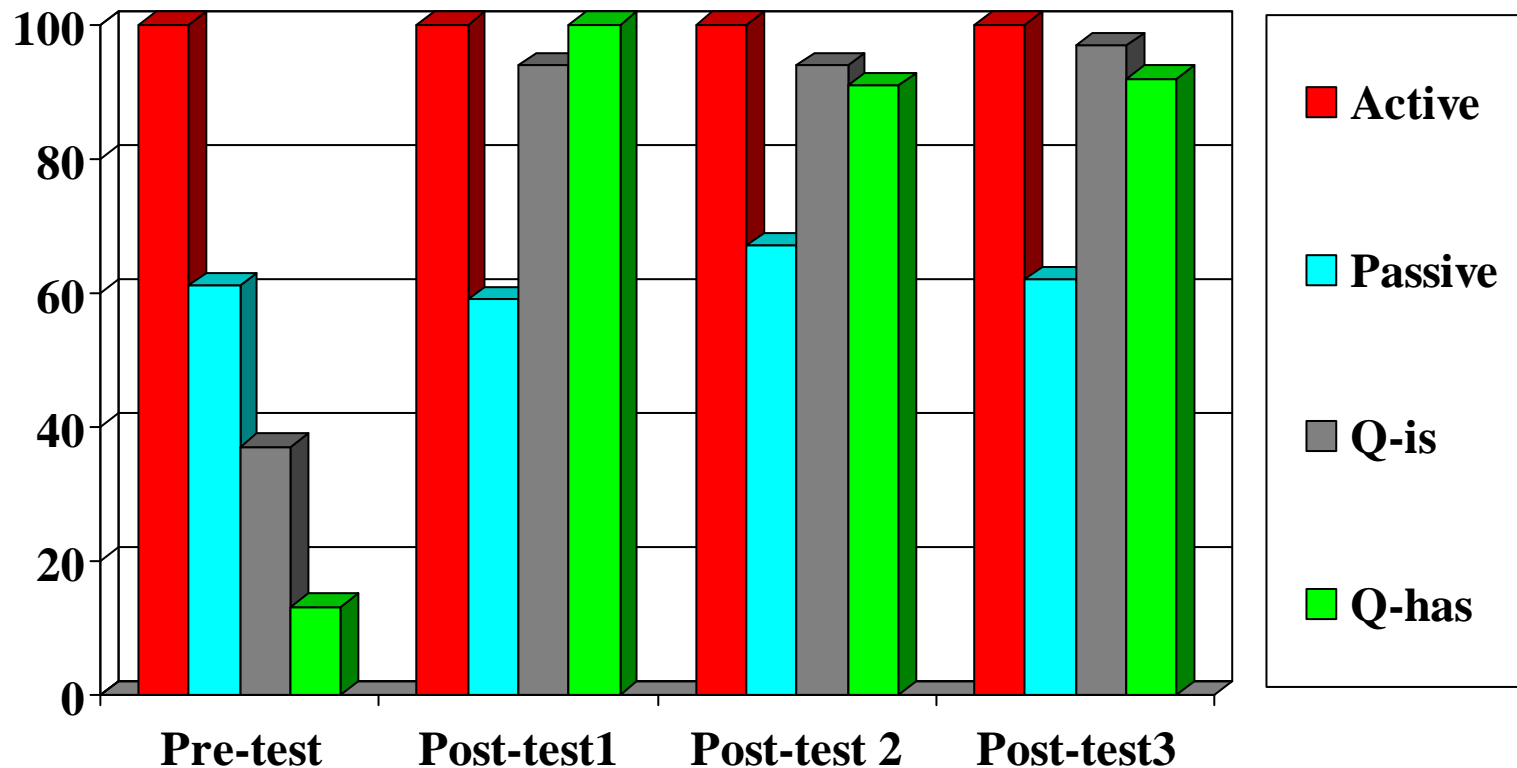
- Actives - Q-is: ($z = -1.34$, $p = 0.54$)
- Actives - Q-has: ($z = 0.00$, $p = 1$)
- Active > Passive: ($z = -2.69$, $p = 0.021$)

Quantifier group (N=9)



- Actives - Q-is: ($z = -1.73$, $p = 0.25$)
- Actives - Q-has: ($z = -1.89$, $p = 0.18$)
- Active > Passive: ($z = -2.80$, $p = 0.015$)

Quantifier group (N=7*)



- Actives - Q-is: ($z = -1.00$, $p = 0.93$)
- Actives - Q-has: ($z = -1.73$, $p = 0.95$)
- Active > Passive: ($z = -2.46$, $p = 0.042$)

The Untrained Condition

No significant improvement on untrained condition BUT...

- Q-has improved on Q-is
 - Variants of same construction? - i.e., NP BE PREP LOCATION/LOCATION HAVE NP PREP *it* - unlikely given pre-test results
 - Participants draw inferences about Q-*is* meaning because implicitly contrasted with Q-*has* in training?

Reading & Need for Cognition

- Overall test score
 - Amount of reading: ($\rho = .551, p < 0.001$)
 - Need for Cog: ($\rho = .576, p < 0.0001$)
- Passive score
 - Amount of reading ($\rho = .529, p < 0.001$)
 - Need for Cog ($\rho = .404, p < 0.005$)
- Quantifier score
 - Need for Cog ($\rho = .606, p < 0.001$)
 - Amount of reading ($\rho = .520, p < 0.001$)
- Z-tests for two correlation coefficients
 - Passive score: $z = 3.53, p < 0.001$
 - Quantifier score: $z = 2.78, p = 0.005$)

It's only a correlation, but....

- Amount of reading more relevant for development of knowledge of passive?
 - (relatively frequent in written texts)
- Need for cognition more relevant for development of knowledge of quantifiers?
 - (quantifiers play important role in logical reasoning (Braine and O'Brien 1998))

Summary: Exp1

- Education related diffs in knowledge of passives and quantifiers
- NB some LAA at ceiling even on Q-has
- Diffs due to amount of linguistic experience

Summary: Exp2

- Training results in significant improvement on conx
 - evidence that constructional schemas emerge as result of experience
 - poor performance on pre-test NOT due to lack of attention, working memory capacity etc.

Why education-related differences?

Quantitative diffs in linguistic experience

- less educated speakers have less relevant experience?
- more educated speakers get more exposure to language overall

Eureka!

Qualitative diffs in linguistic experience

- more educated receive more exposure to explicit explanation of language as children?
 - evidence from L2 (instruction jump starts implicit learning - Ellis 2005)
 - ‘eureka’ experience of participants during training

Need more; get less?

- LAA less efficient language learners
 - correlation: reading & need for cog with comprehension score
- Combination of factors
 - LAA need more experience BUT get less

Conclusions

- Vast individual performance differences on tasks tapping knowledge of basic linguistic constructions
- Cannot be explained by appealing to:
 - working memory capacity, test-taking skills, or willingness to cooperate with experimenter
- Differences strongly correlated with education
 - experience with (written) language, Metalinguistic skills, IQ/verbal ability?, Motivation to learn/curiosity?

Some implications

- Usage-based theories: Entrenchment
- Methodology: *which* adult control group?
- Social and educational policy
- Generative linguistics: raise doubts about one of the most widely accepted arguments for an innate UG
- Learners need more experience than is often assumed

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