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The Science of Learning in Action

7 Insights From Real Data

Phil Menary

VP of Development
Axonify

Alice Kim

Research Associate
York University, Rotman Research Institute of Baycrest,
Axonify

The Focus of Today

- The Modern Learner
- How the Data was Gathered
- The 7 Insights in Detail
- Summary of Insights
- Q&A Period

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Meet the Modern Learner

The Modern Learner

1%

Of a typical workweek to focus on training & development.

Overwhelmed

75%

of workers state that they are stressed at work.

Impatient

>70%

of Learners turn to search engines.

Distracted

57%

of interruptions at work result from either social-media tools or apps.

Untethered

67%

of all workers use mobile and wireless computing.

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Source: Bersin Research Bulletin, Meet the Modern Learner, November 26, 2014

Catering to the Modern Learner

1% Of a typical workweek to focus on training & development.

Spacing techniques

Reinforcement

Engagement

Retrieval practice

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7 Insights From Real Data

How we Gathered the Data

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- Lot of variables from these sessions are recorded:
  - Accuracy of their response
  - Question format
  - Question itself
  - Difficulty level of question
  - Employee job title, department, line of business, confidence level

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- Data from 250K employees, across 55 different organizations

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How we Gathered the Data

31%
Retail Associates

18%
Professional Sales Reps

37%
Manufacturing/Distribution Employees

14%
Other Knowledge Workers

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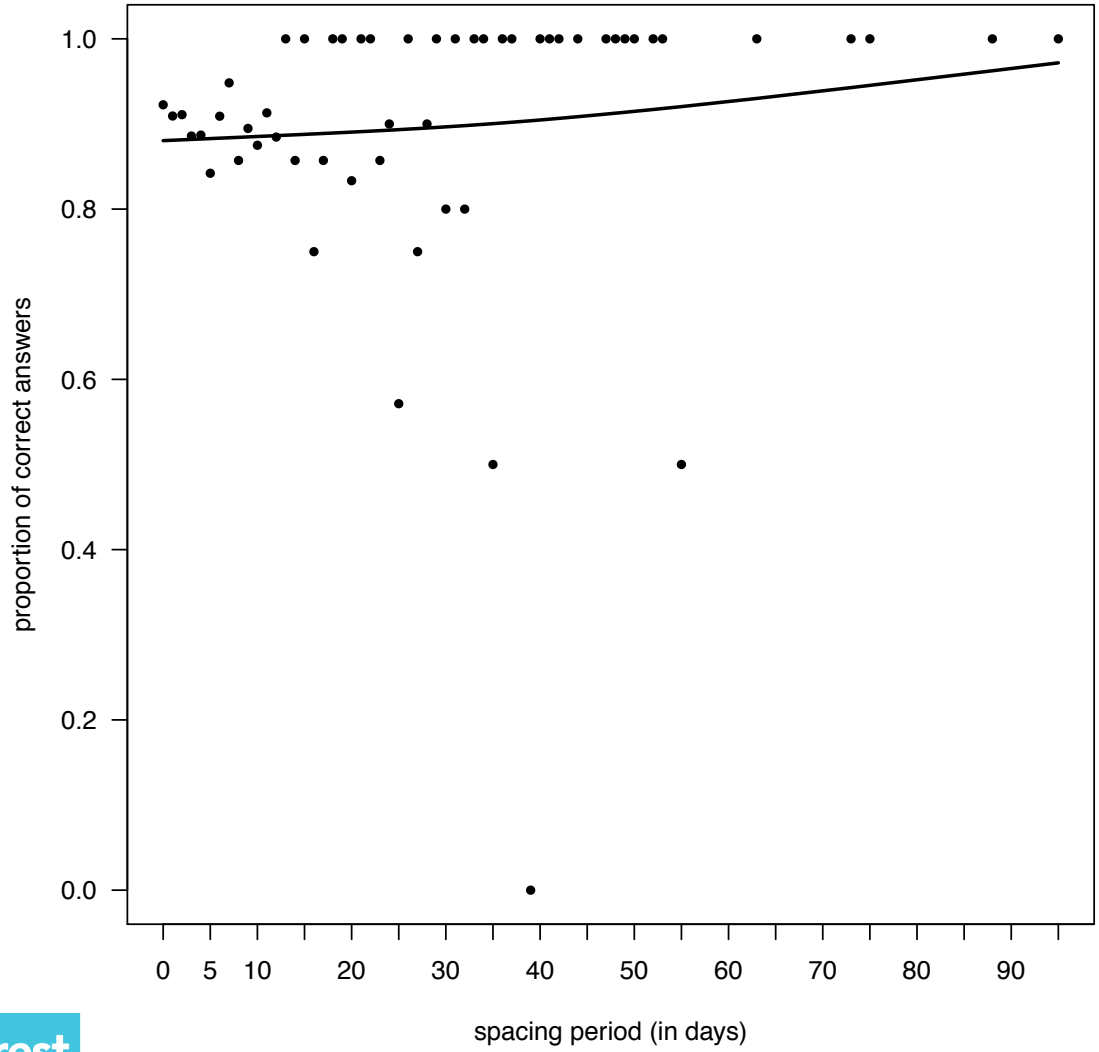
Spacing out your practice improves knowledge retention

Data from 5 companies

Retention interval < 2 days



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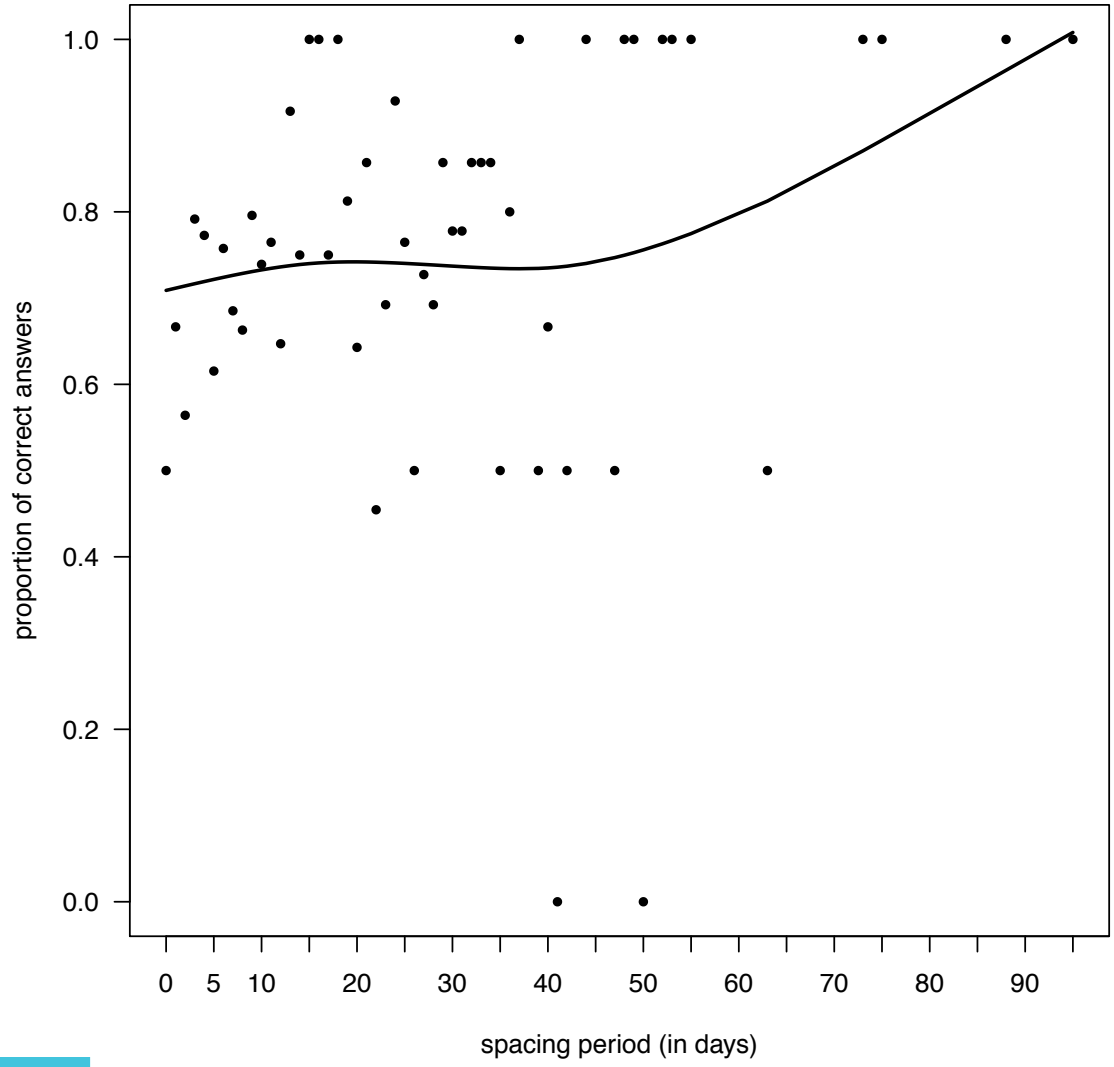
Data from 5 companies

Retention interval = 45 to 60 days



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Our Model

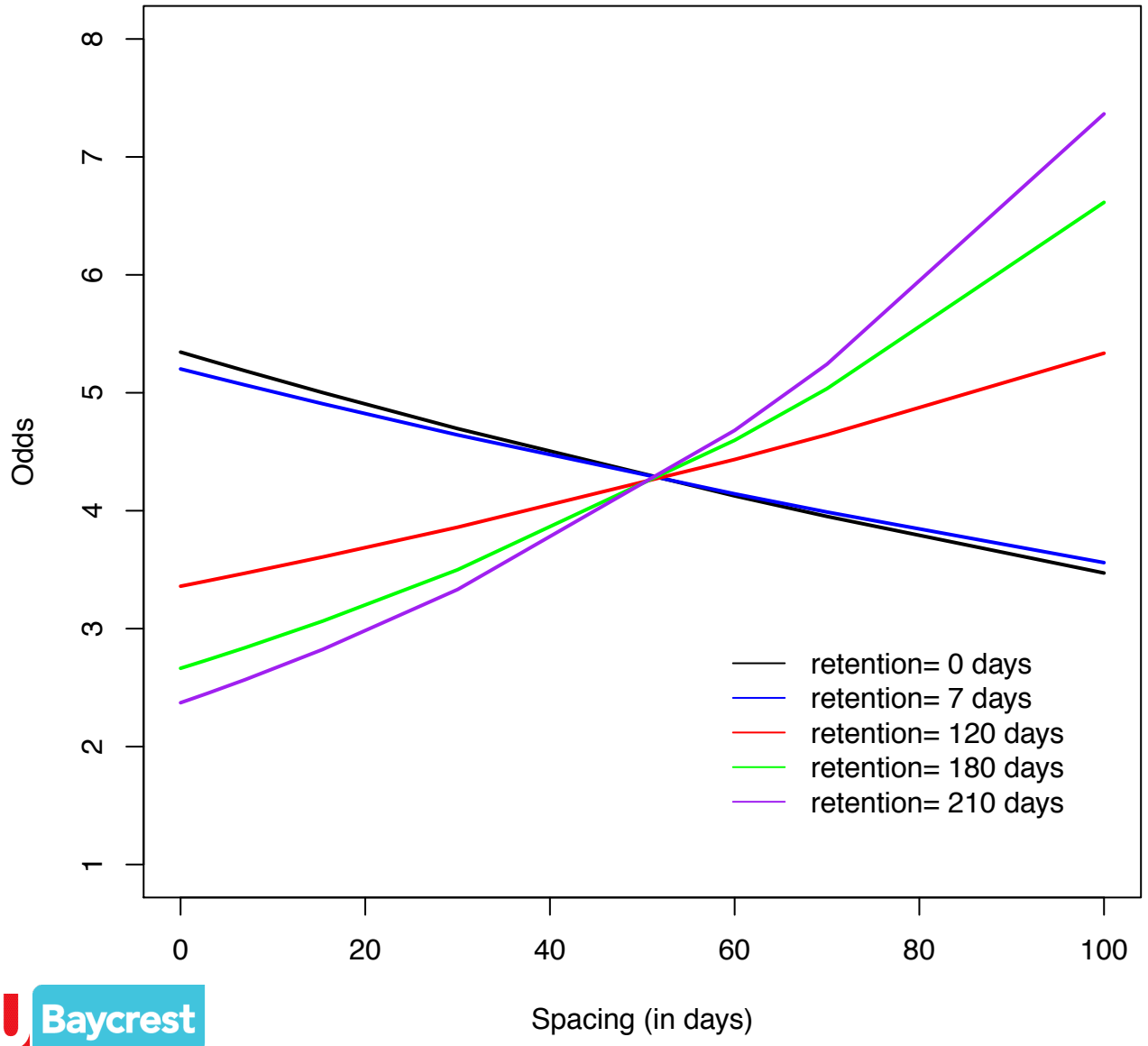
Question format

$$\log\left(\frac{p_{ji}(x)}{1-p_{ji}(x)}\right) = \beta_0 + \beta_{Spacing} X_{1ji} + \beta_{RI} X_{2ji} + \beta_{QF} X_{3ji} + \beta_{S:RI} X_{ji} + \beta_{RI:QF} X_{ji} + \gamma_j + \gamma_i$$

Spacing between learning

Retention interval

From the model …



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Actionable Insights From the Data

- Spacing out your study events for a particular item of information will help you retain it over the long run
- The optimal amount of spacing is related to the length of the retention interval

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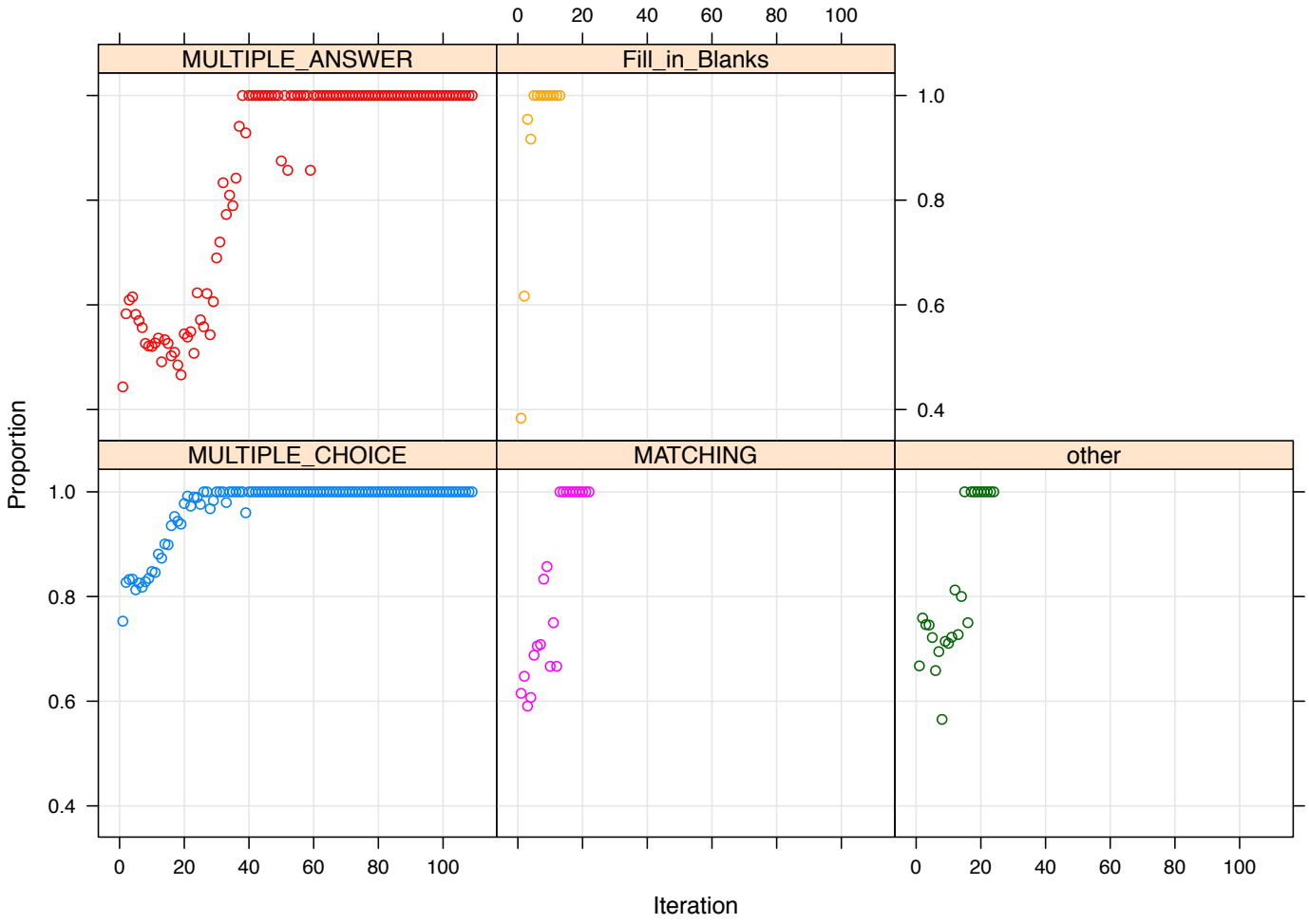
Assessments of knowledge retention are largely impacted by question format

Data from 5 companies



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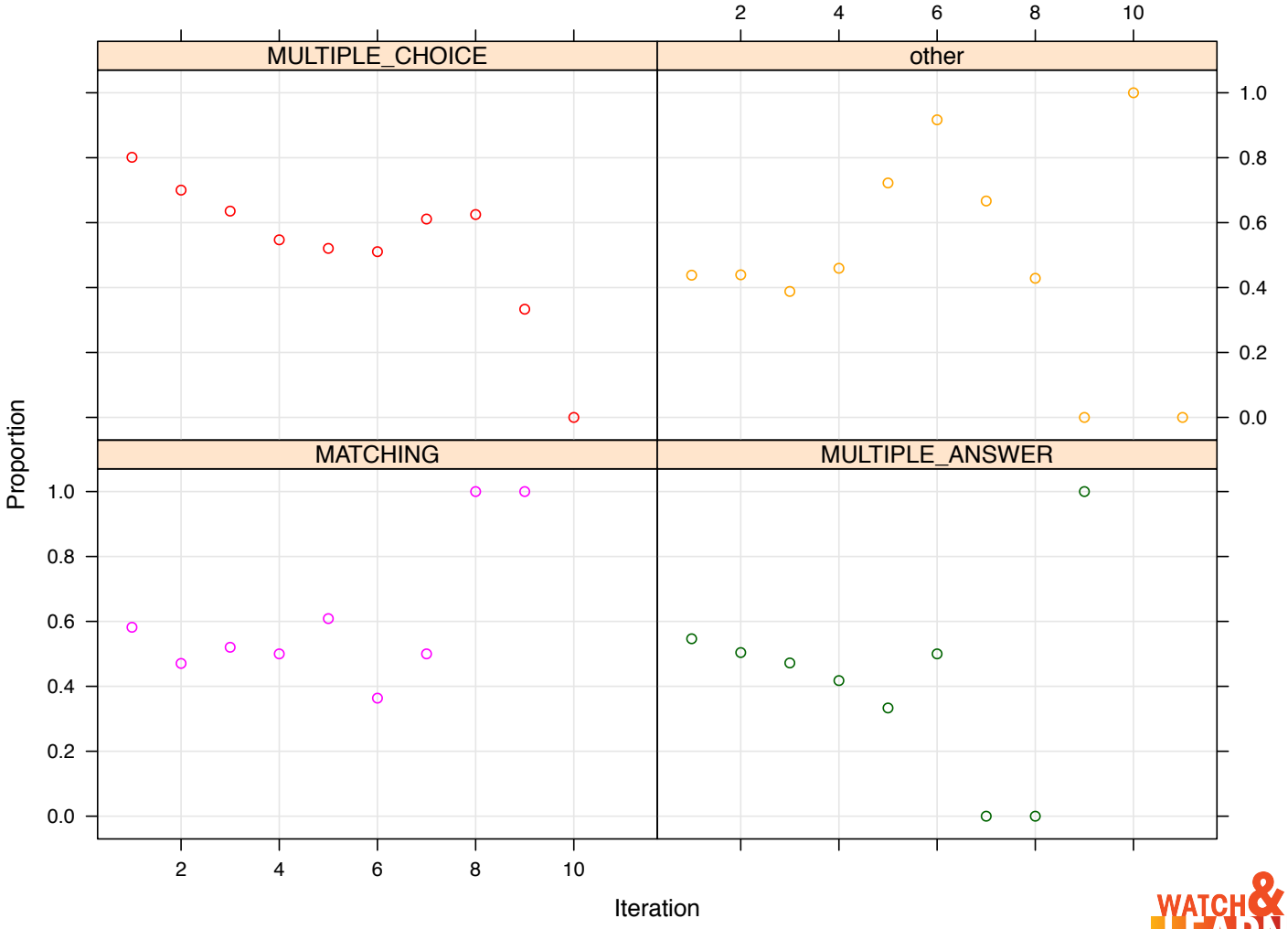
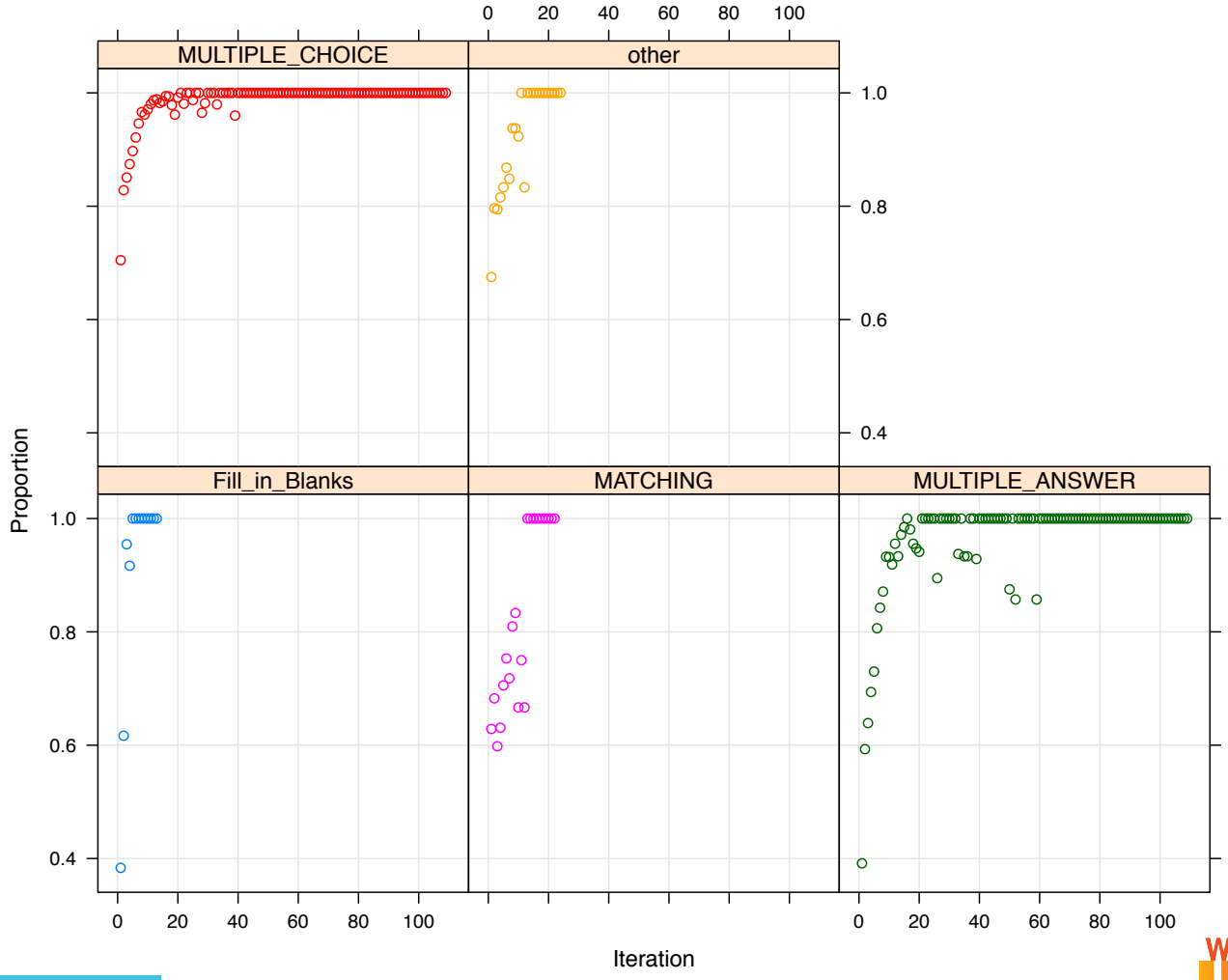
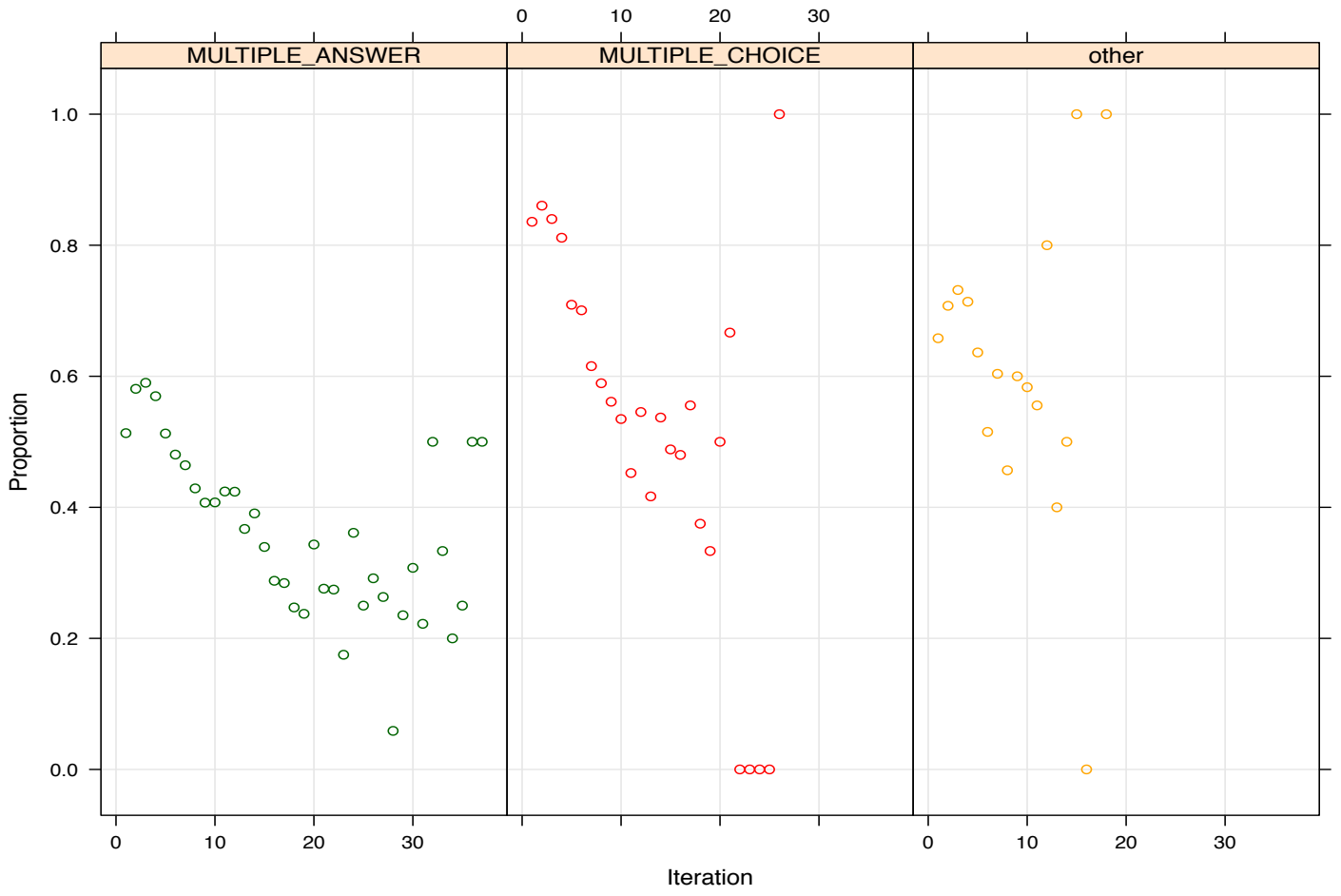
Company 29: Pharmaceutical Sales Team



Company 18: Higher education institution



Company 35: Large U.S. retail grocer



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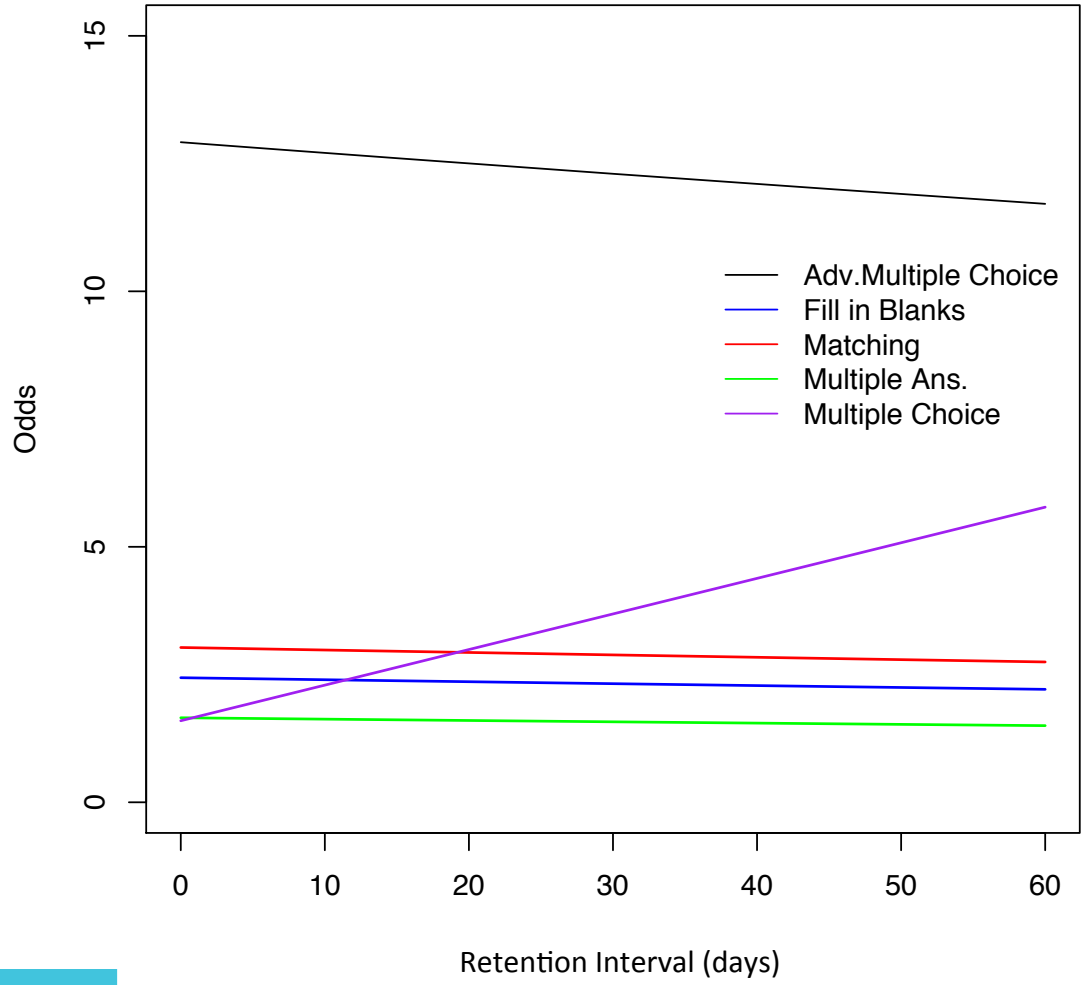
Spacing between learning

Retention interval

From the model …

[Spacing between study events = 30 days]



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Actionable Insights From the Data

- Be mindful that the way a question is asked impacts the accuracy of the employees response
- Consider that retention interval (time between training session and assessment) impacts performance differently across question format

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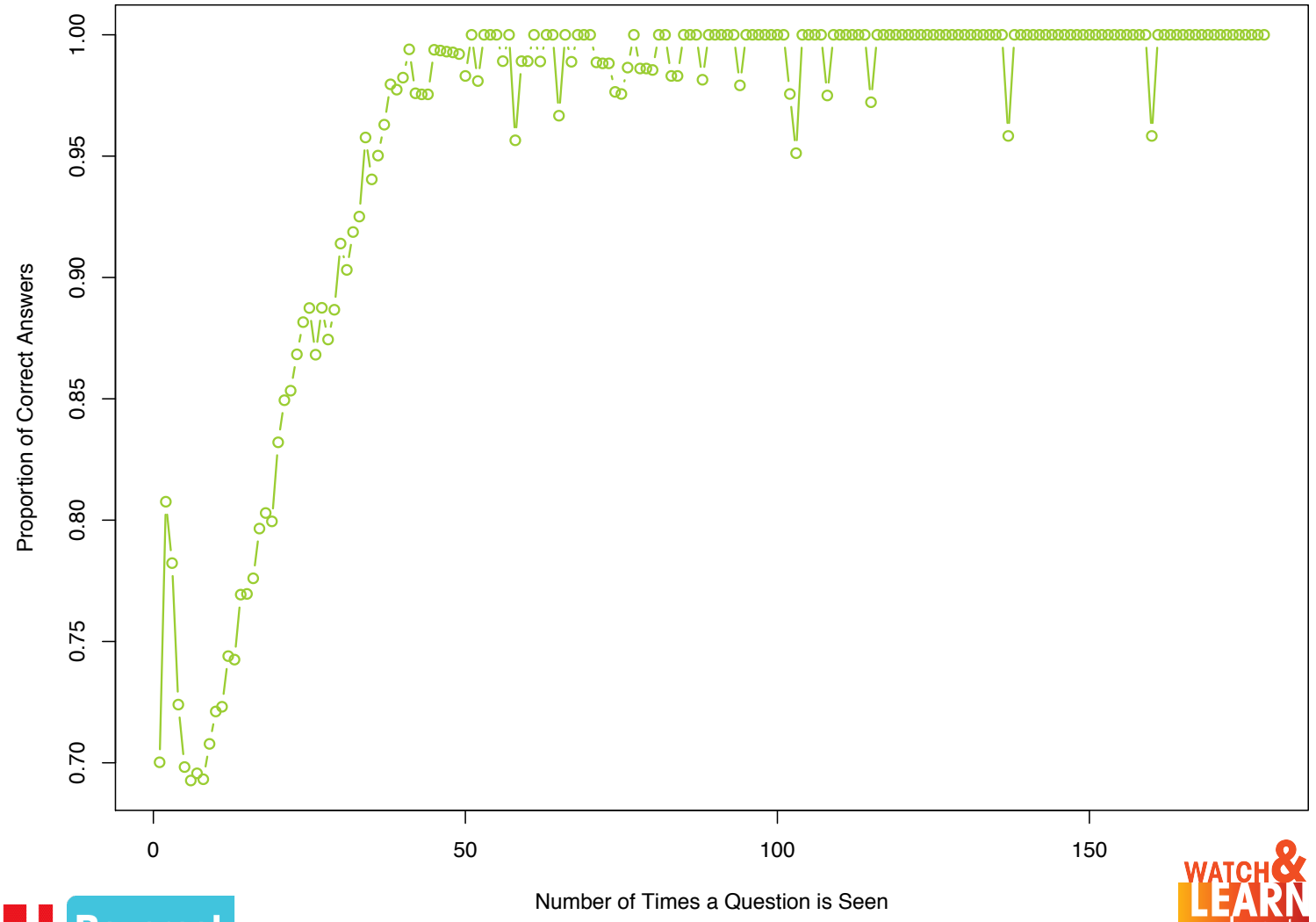
Performance improves with practice and reinforcement for all question formats

Data from 5 companies



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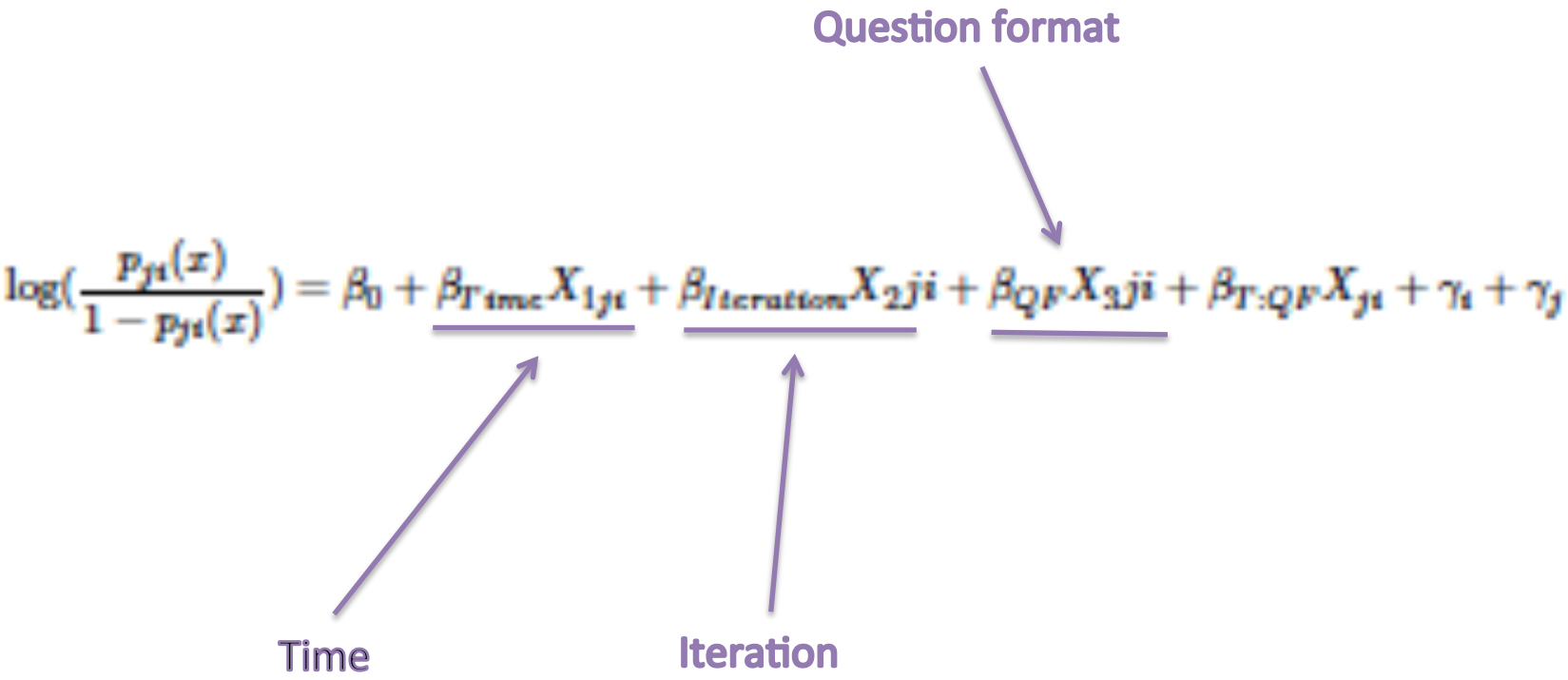
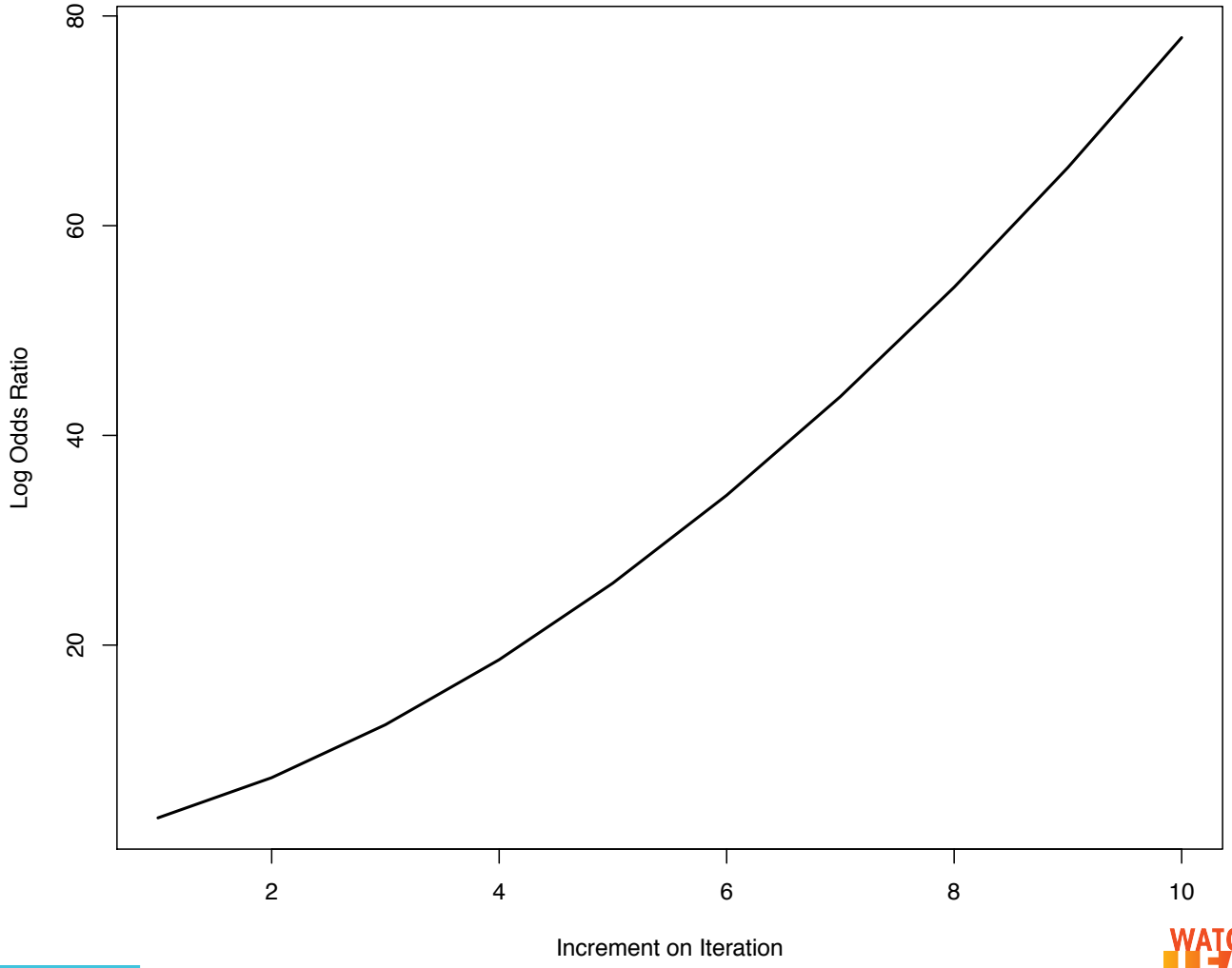
Our other Model



From the model …



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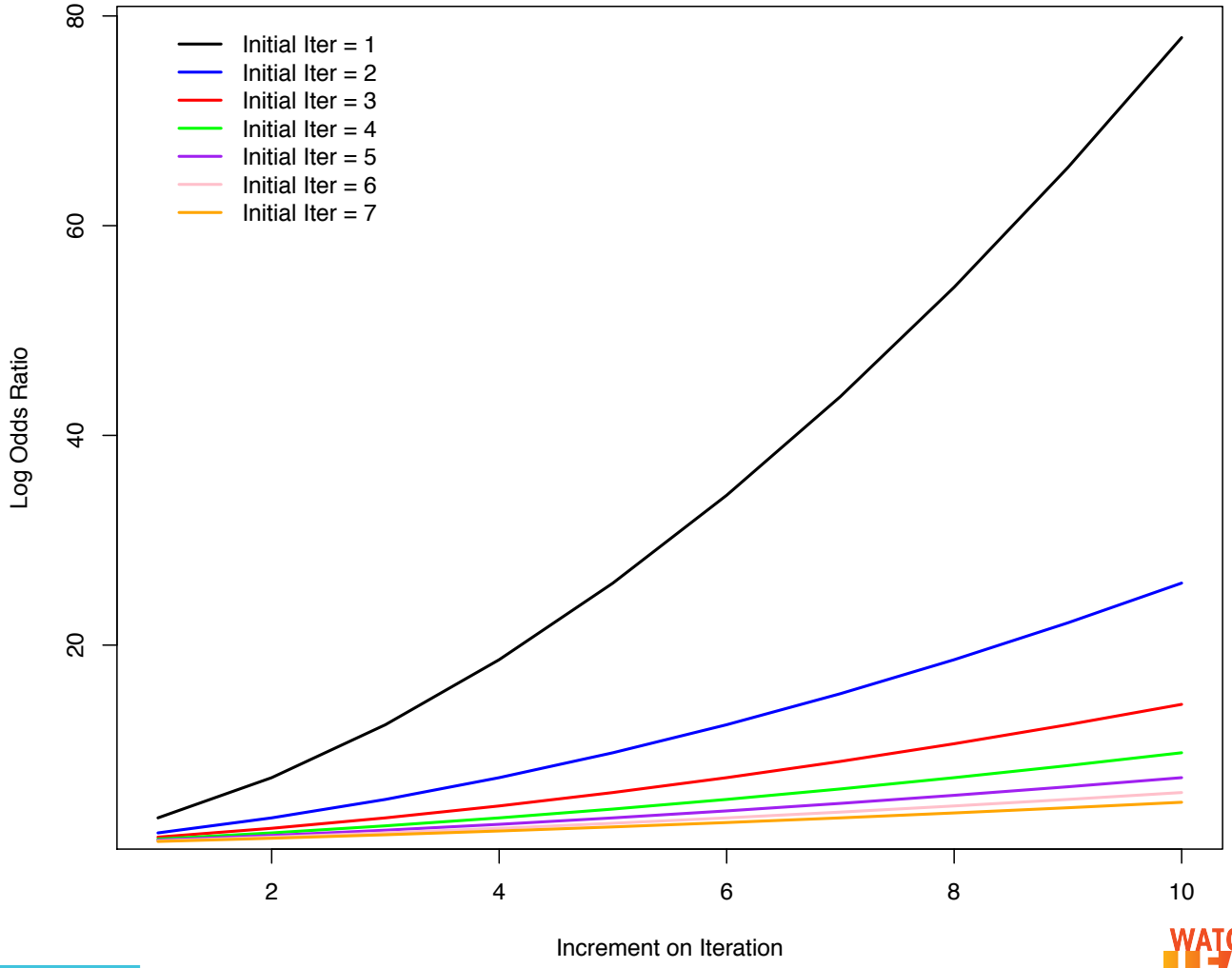

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Actionable Insights From the Data

- Knowledge retention improves with each episode of testing (retrieving information) combined with feedback
- The effect of additional episodes of reinforcement is largest during earlier stages of training

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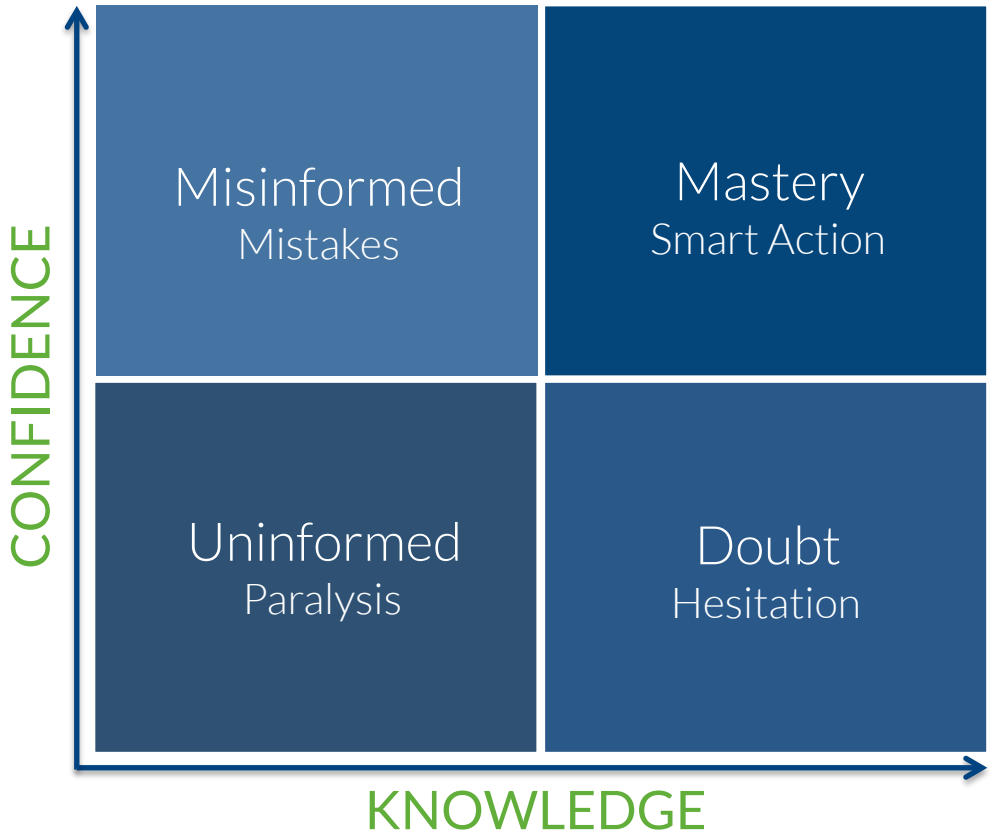
Confidence in knowledge increases with reinforcement

Confidence-Based Assessment

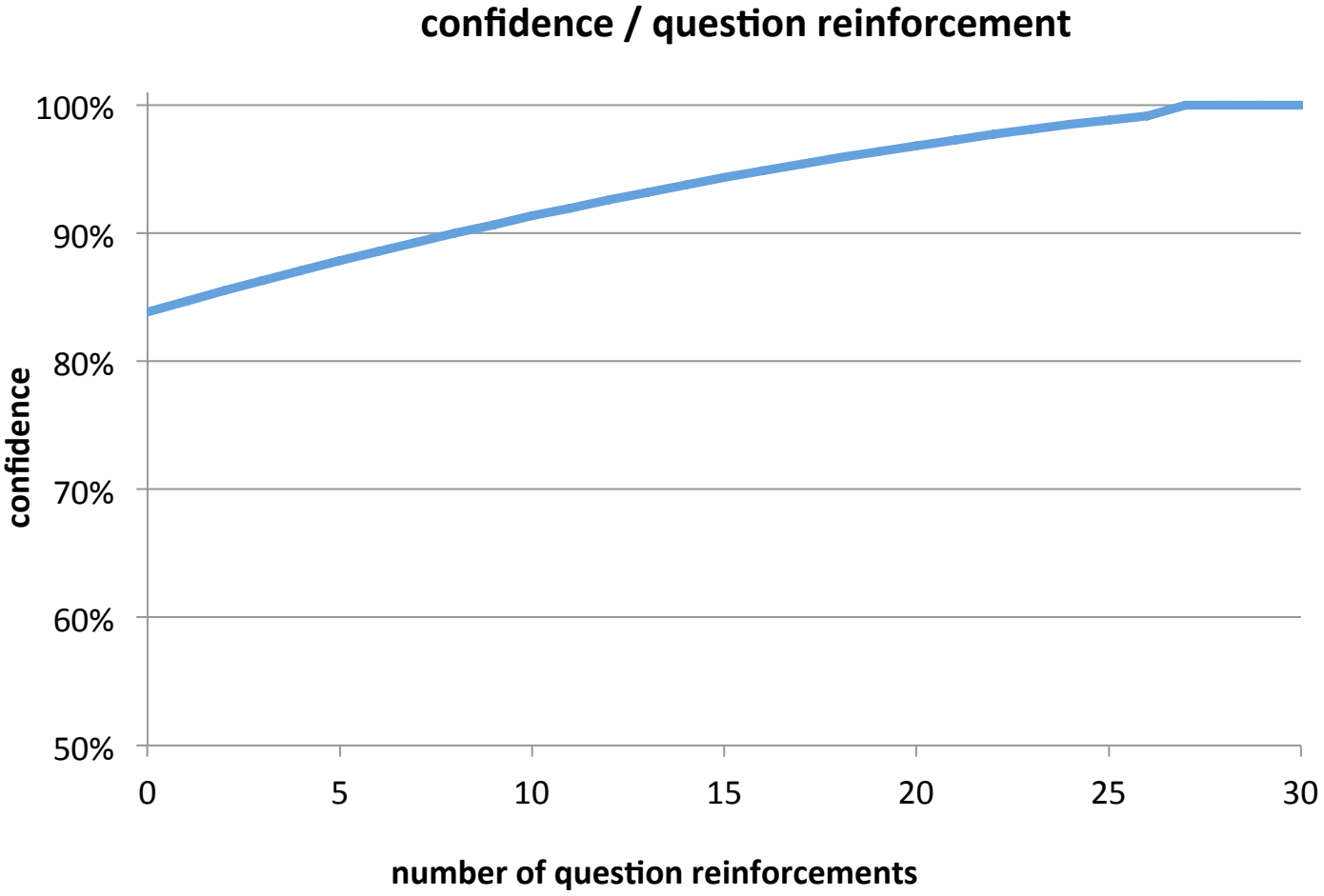


The use of a confidence-based learning methodology:

- Has shown better knowledge retention and knowledge acquisition.
- Triggers an emotional reaction, which assists with long-term retention.

Source: Dr. James Bruno Confidence-Based Learning Methodology, UCLA

What Does the Data Show?



Correlation: $r = 0.86$, $p < 0.05$

Actionable Insights From the Data

- As questions are reinforced, confidence level grows
- As confidence level grows, knowledge increases
- Direct correlation between confidence & knowledge

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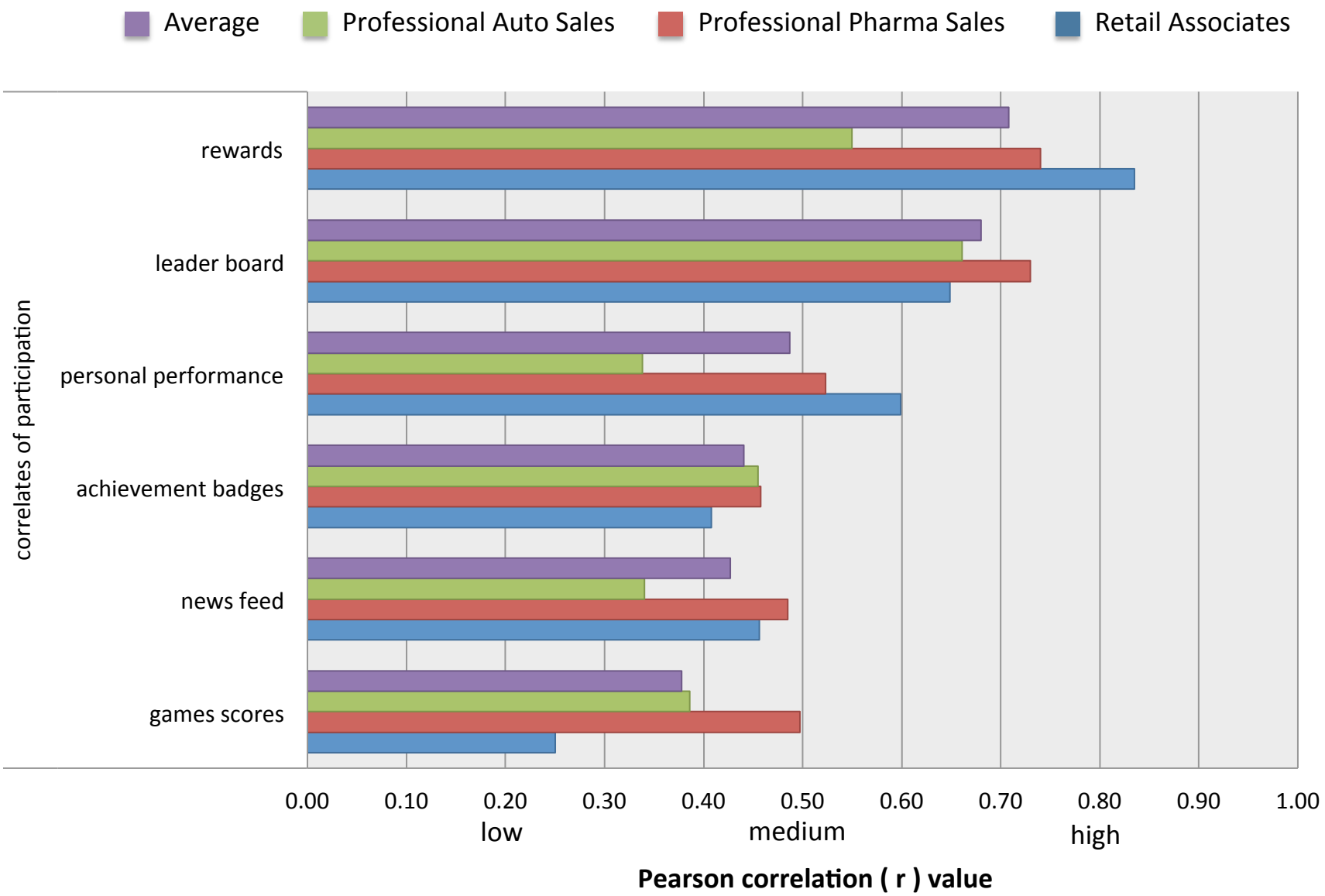
Introducing game elements has a high correlation with participation

What Does the Data Show?



Actionable Insights From the Data

- Introducing game mechanics can drive participation; driving participation drives knowledge
- Having the choice of gameplay means that you are going to attract more voluntary participation than you would otherwise get

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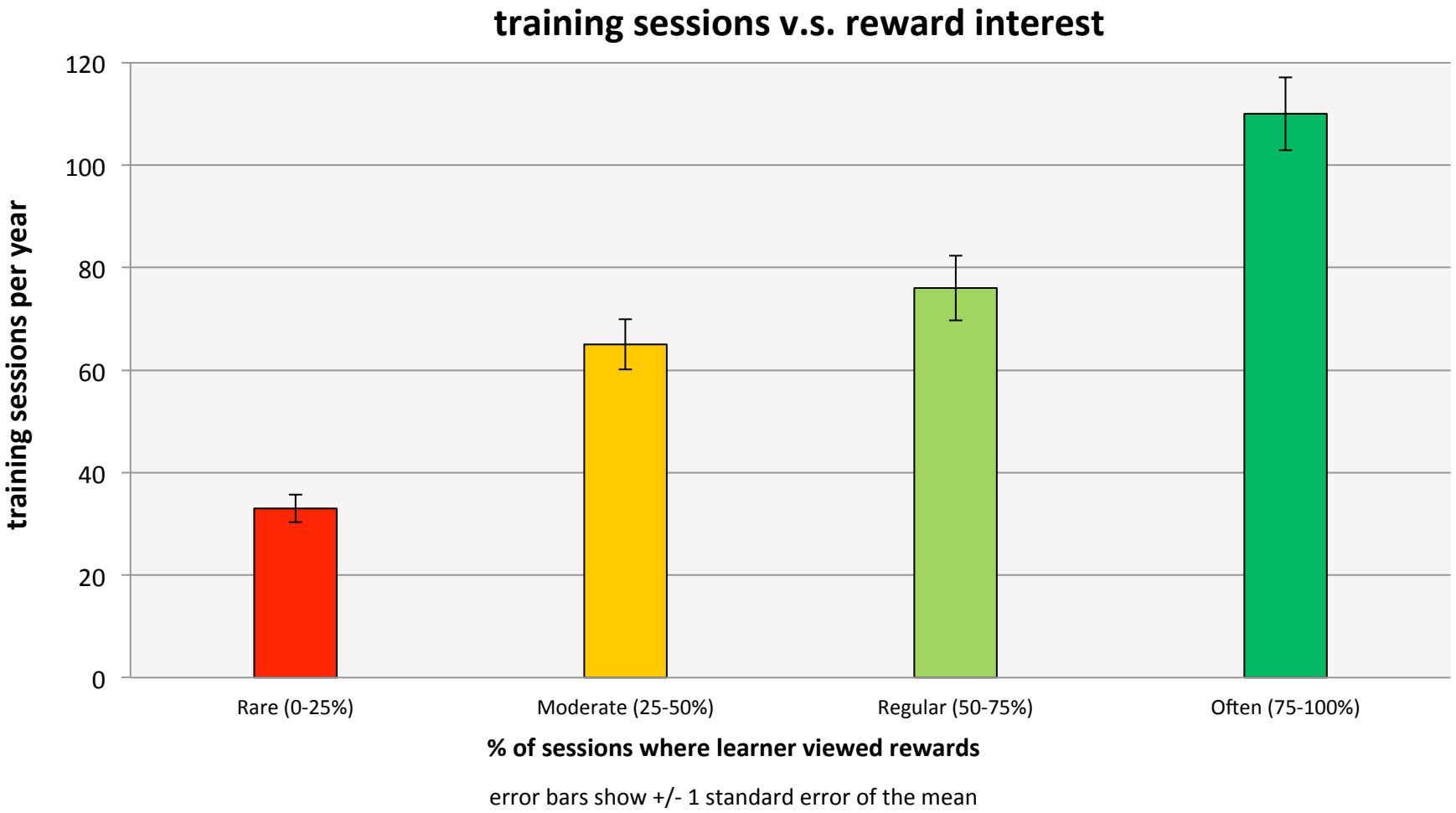
Participation in learning has a high correlation with rewards

What Does the Data Show?



Correlation: $r = 0.74$, $p < 0.05$

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Actionable Insights From the Data

- Offering rewards is a highly effective way to drive participation
- Rewards do not need to be expensive or elaborate – days off, parking spots, pizza parties and other tangible rewards.

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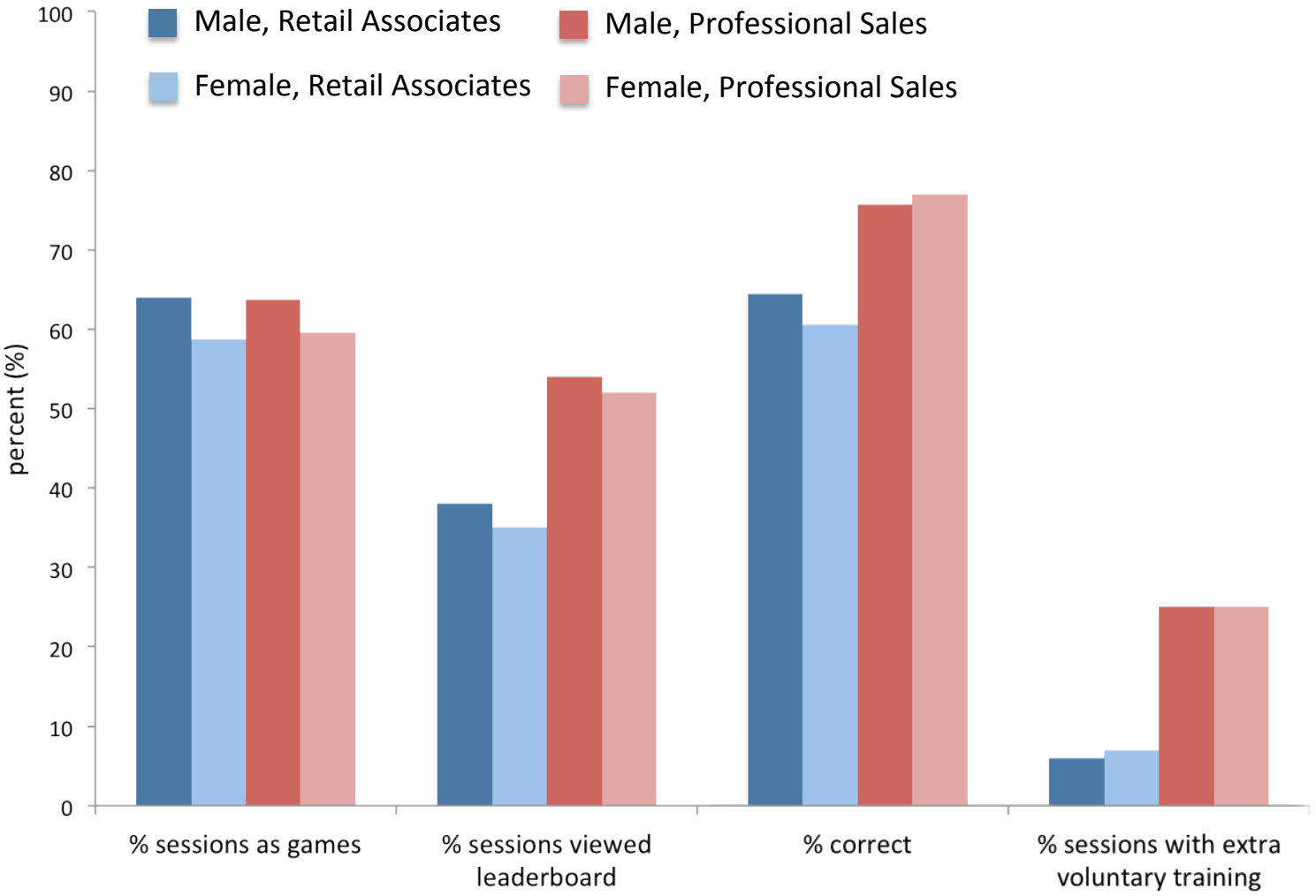
Learning behaviour differs between work environments but not between gender

What Does the Data Show?



Actionable Insights From the Data

- Participation and behavior can vary by type of job, but not gender.
- Before implementing everything, understand which elements of engagement are better suited to your environment.
- Learning behaviors do not differ between gender.

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Time to Summarize

In Summary

1. Appropriate spacing of information improves retention.
2. Question format can impact learner success.
3. Regardless of format, repeat, repeat, repeat to succeed!
4. Confidence grows with reinforcement.
5. Game mechanics improve participation. More participation = more learning.
6. Rewards in particular, drive participation. Keep it simple.
7. Men and women behave the same way when it comes to learning!

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Phil Menary
www.axonify.com/contact

Alice Kim
www.alicekim.ca

ATD ICE Session on Sunday, May 17 at 11:45am:

Brain Science and the Evolution of Corporate Learning