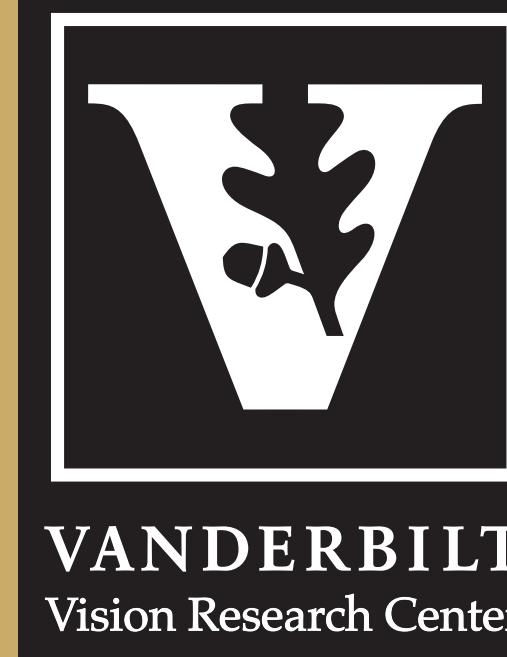




# Modeling the Dynamics of Visual Object Categorization

Jianhong Shen, Jeffrey Annis, Thomas J. Palmeri

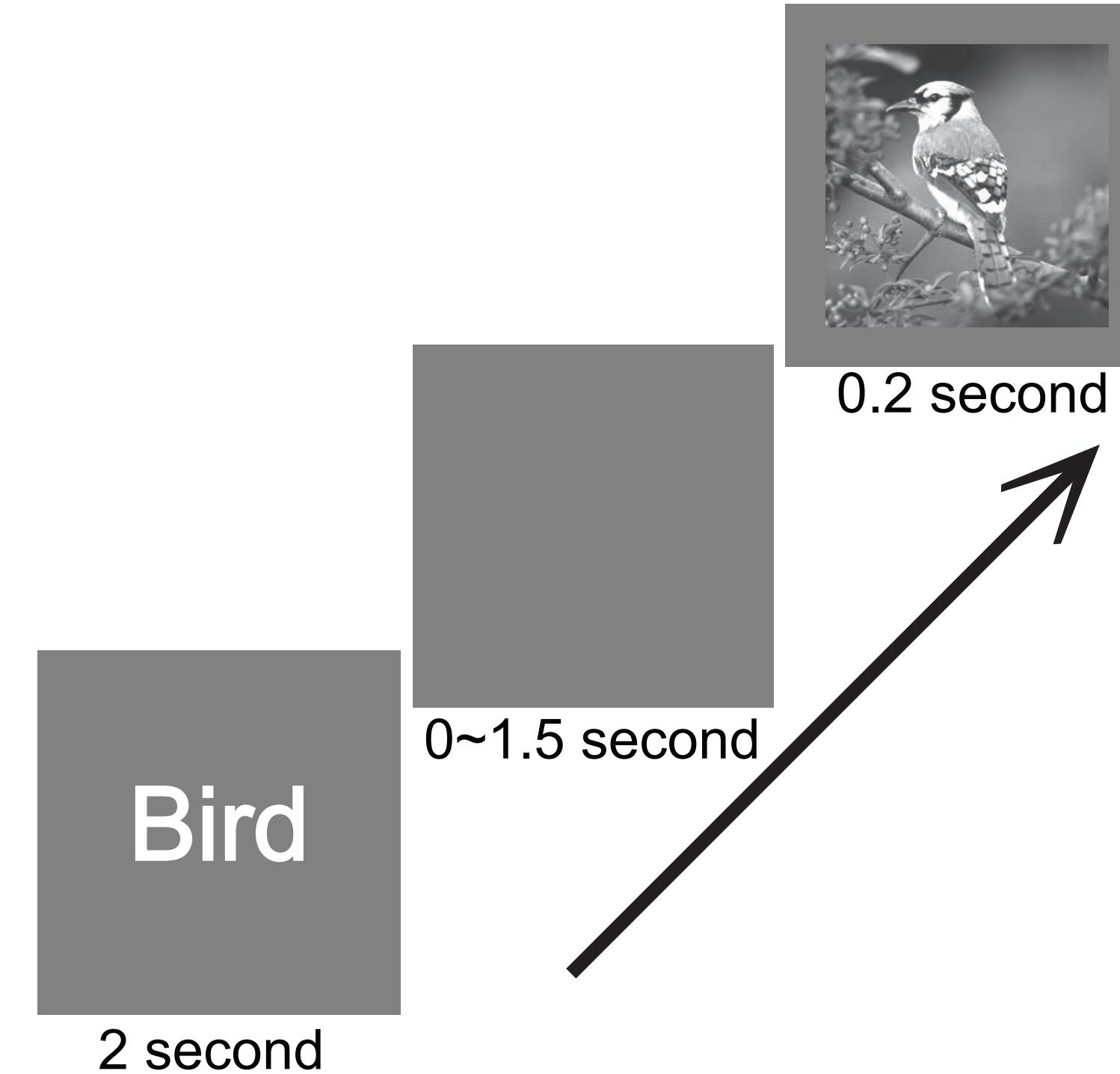
Vanderbilt University (Email: jianhong.shen@vanderbilt.edu)



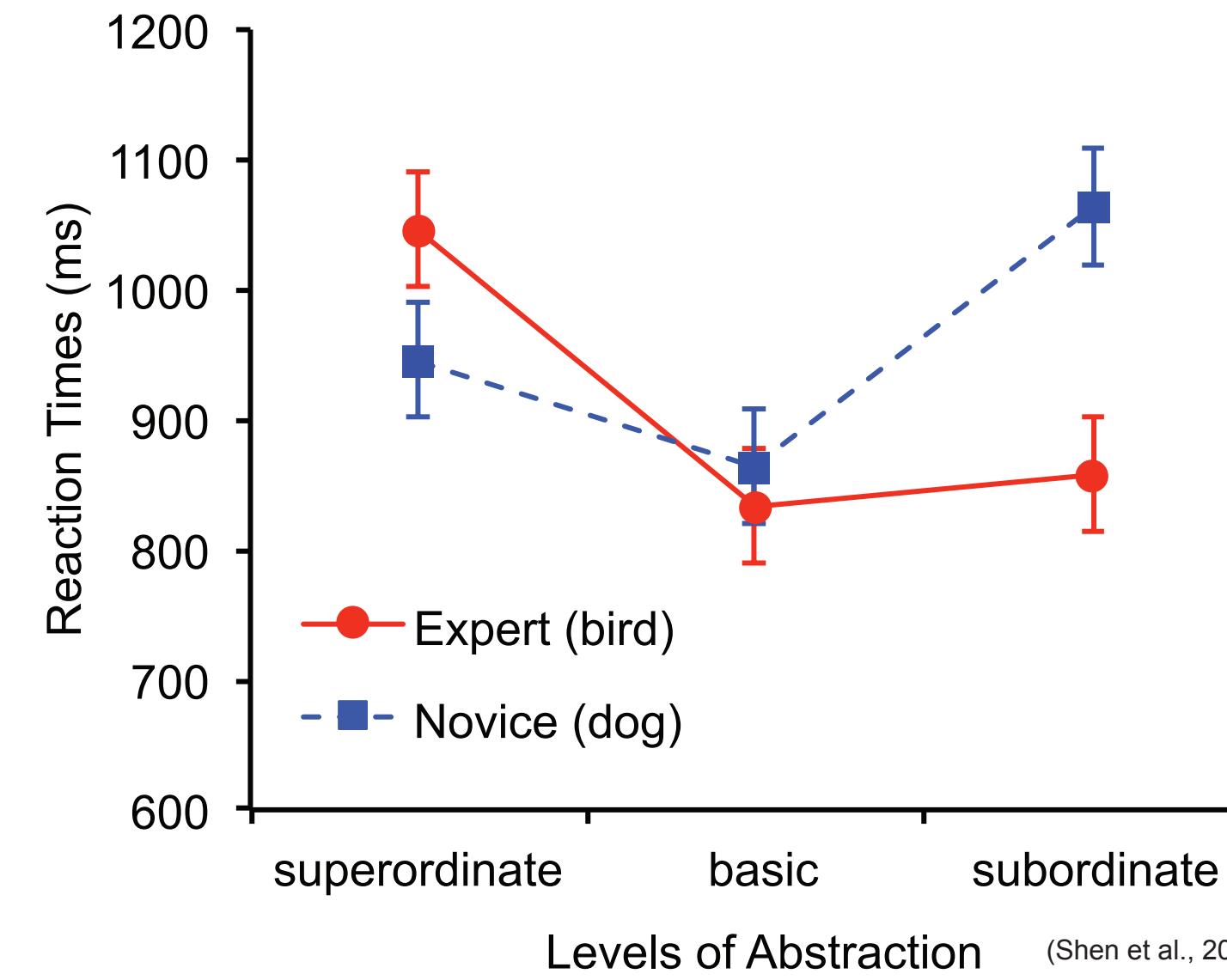
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## Introduction

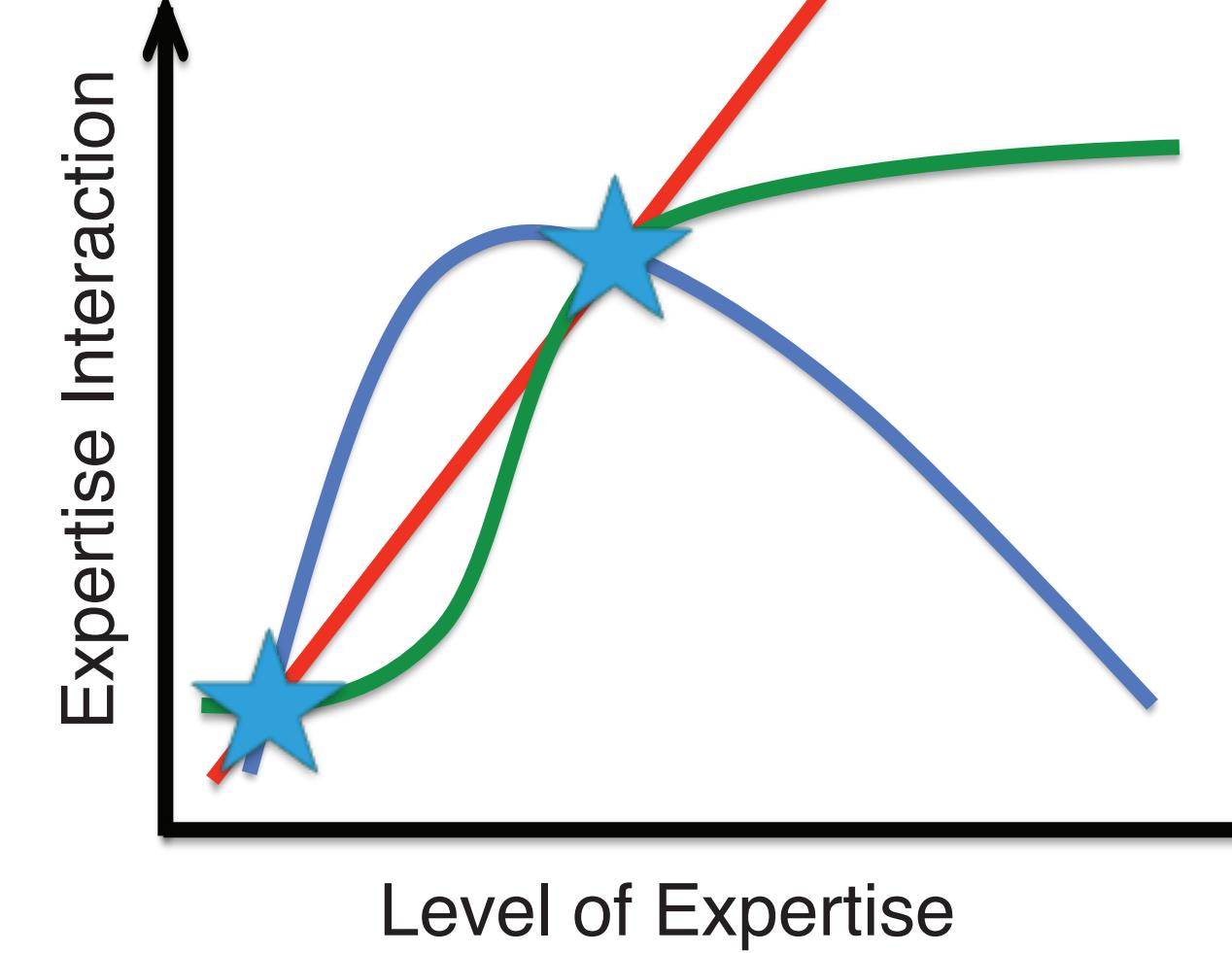
### Speeded Category Verification



### Our Online Replication

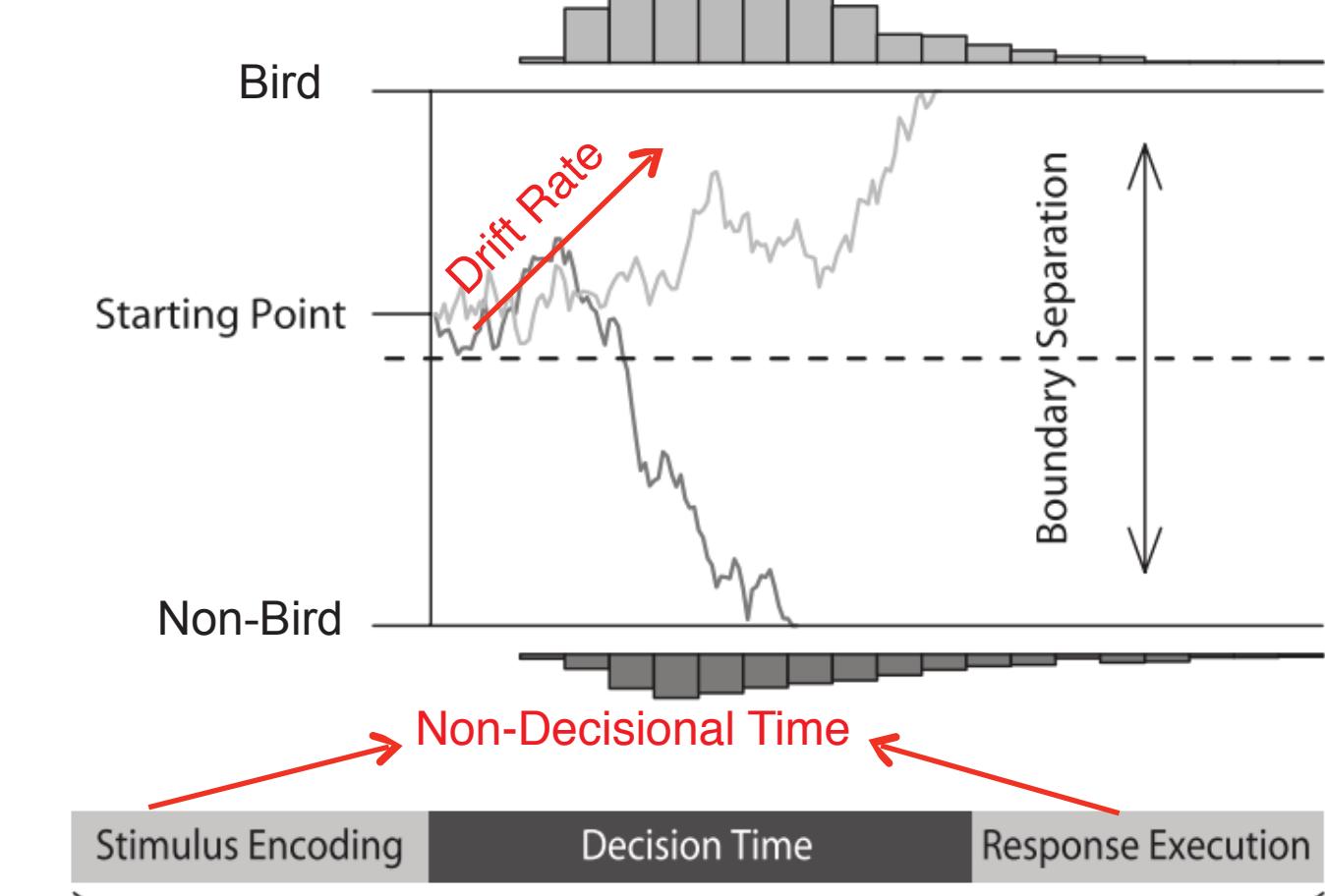


How does categorization differ along the whole continuum of expertise?

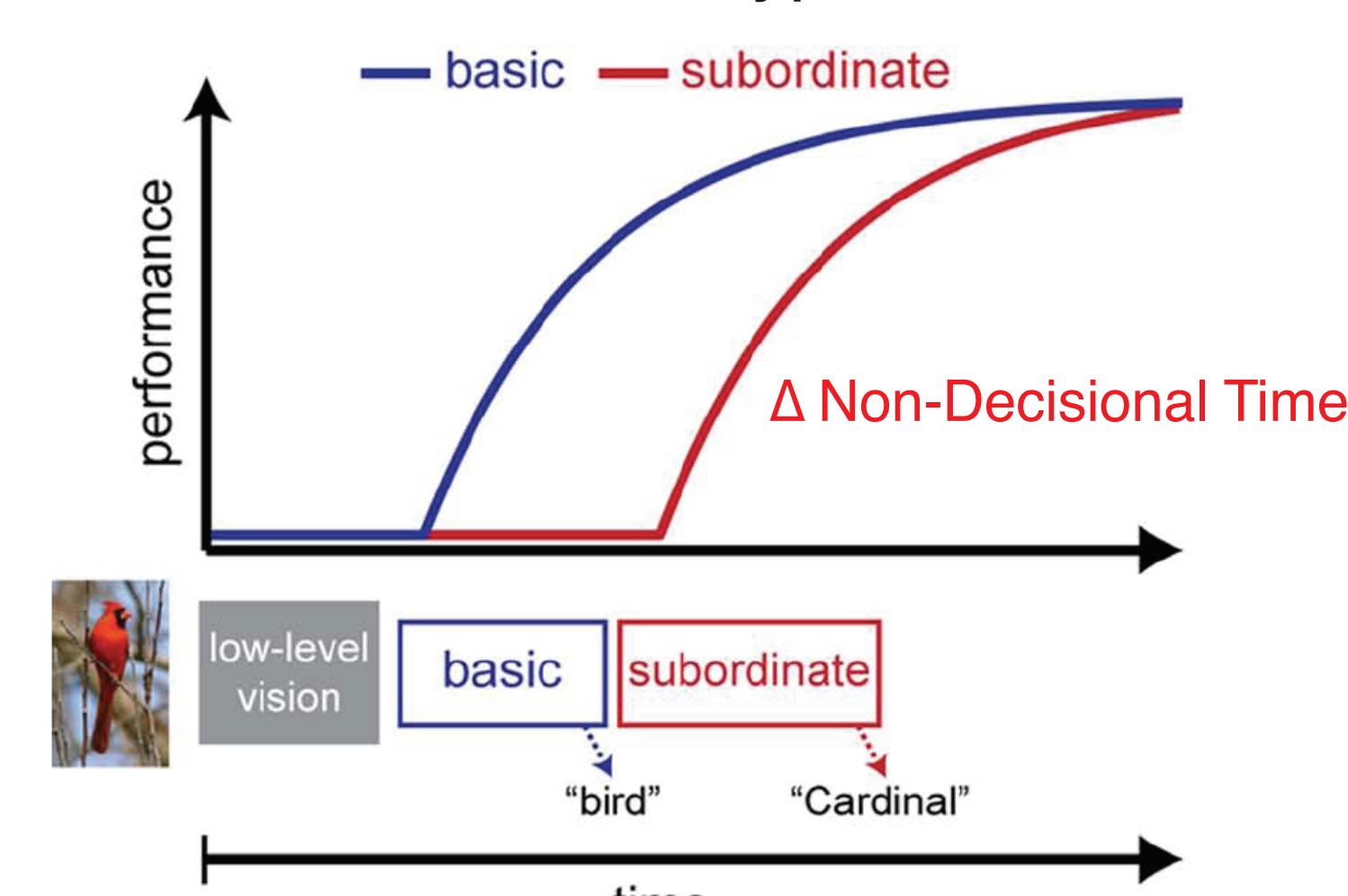


$$\text{Expertise Interaction} = \text{Expert (Subordinate - Basic)} - \text{Novice (Subordinate - Basic)}$$

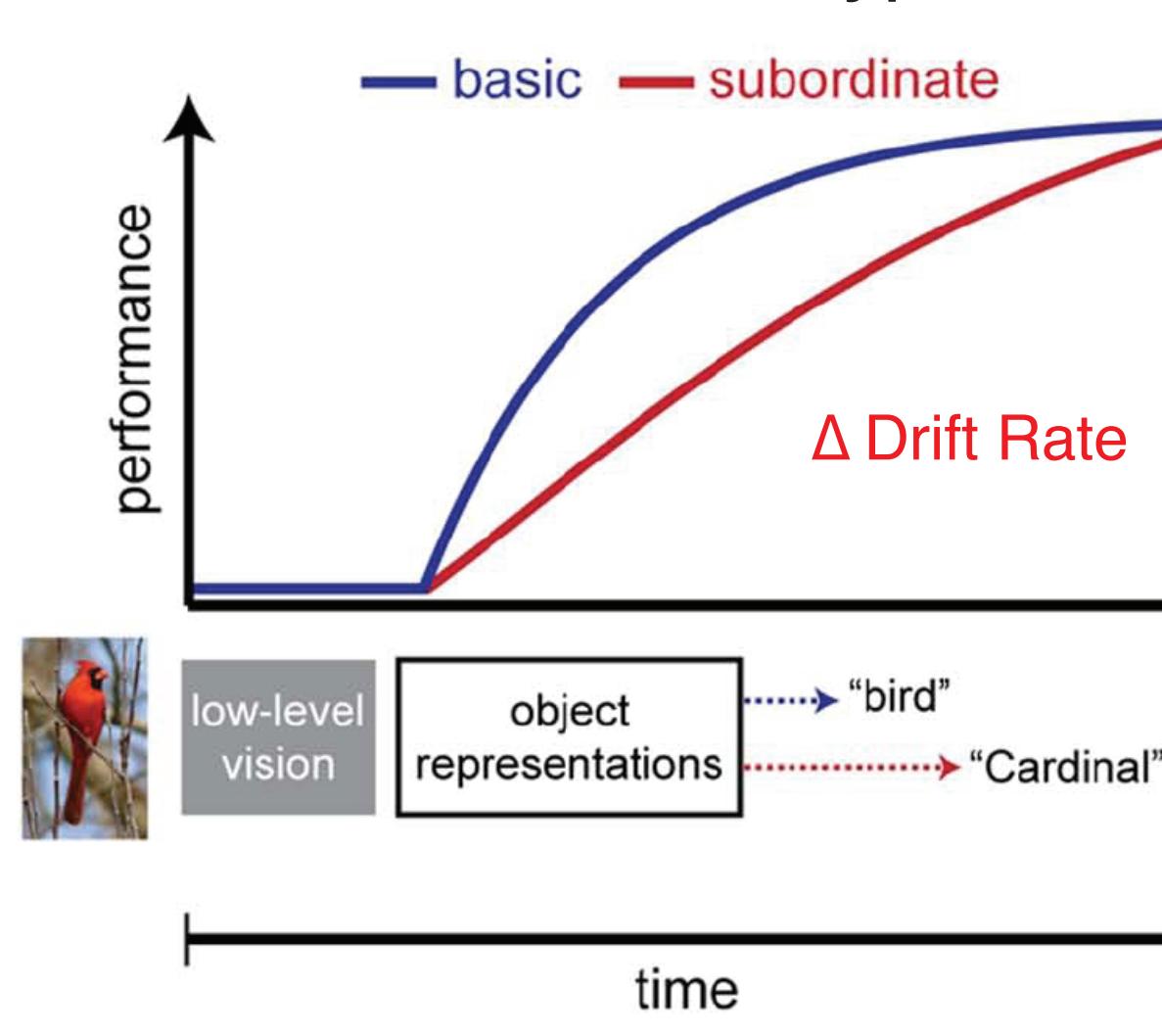
How we do we understand these performance differences theoretically?



The Basic-First Hypothesis



The Differentiation Hypothesis



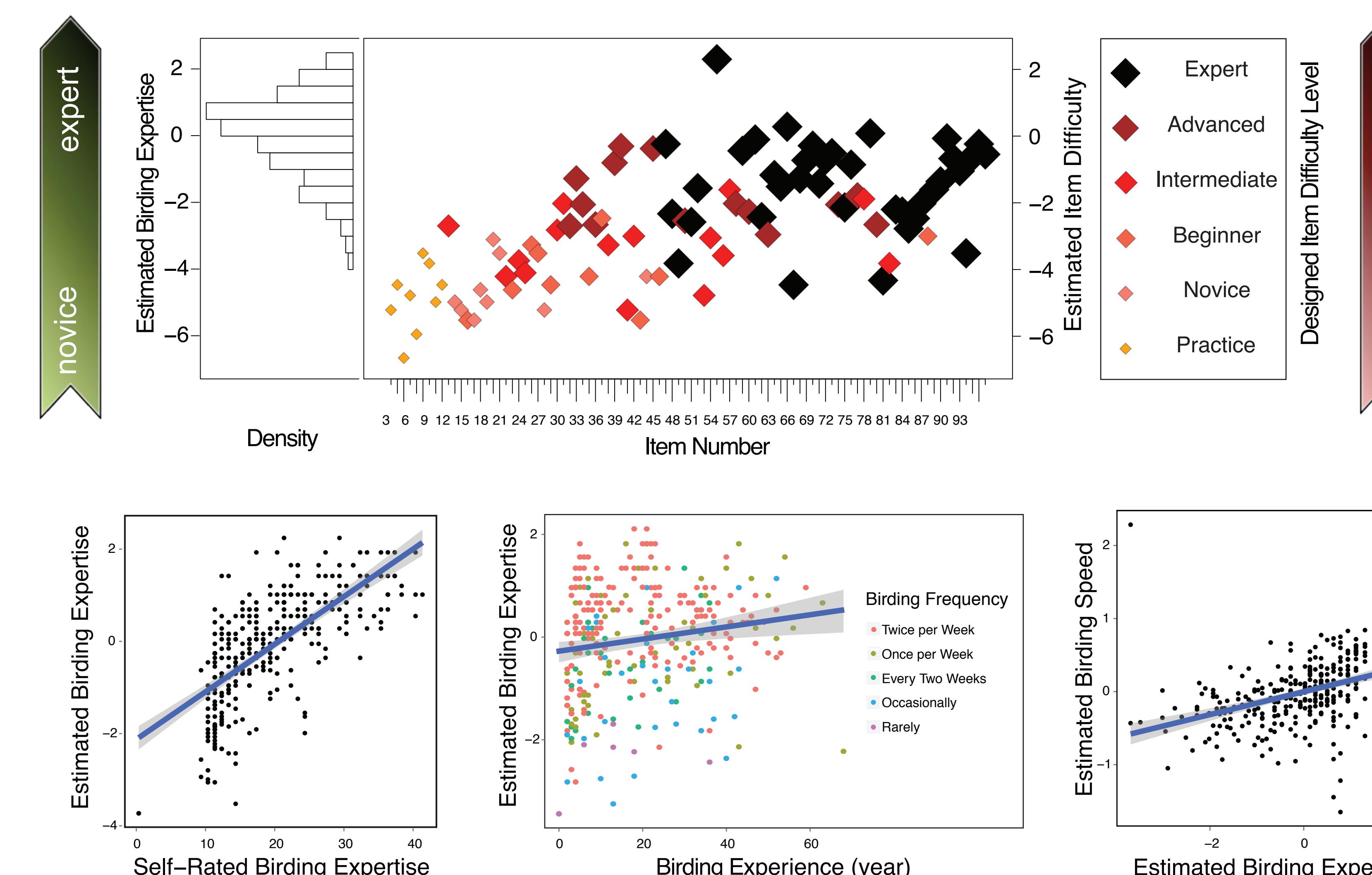
## Birding Expertise Measurement

Person Information:  
323 Bird Watchers  
with varying levels of expertise;  
Recruited online;  
Tested online.

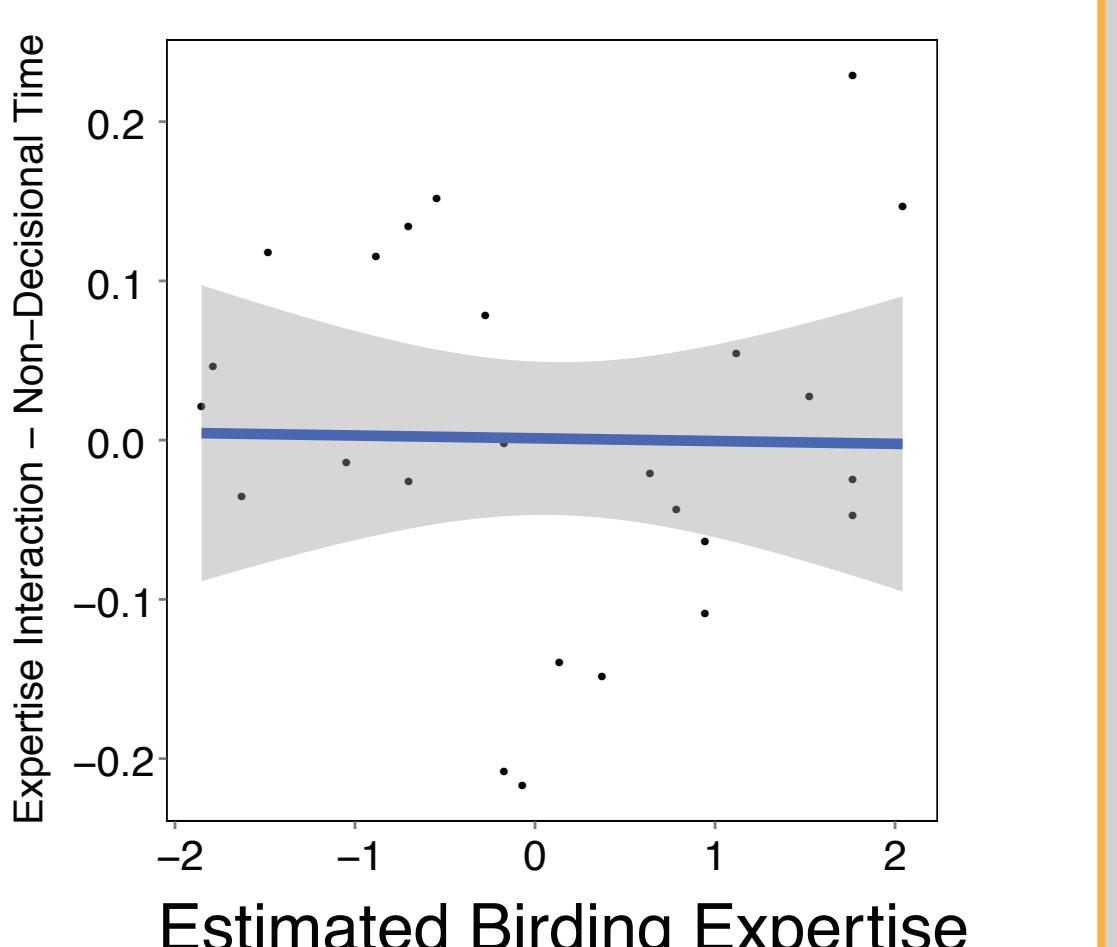
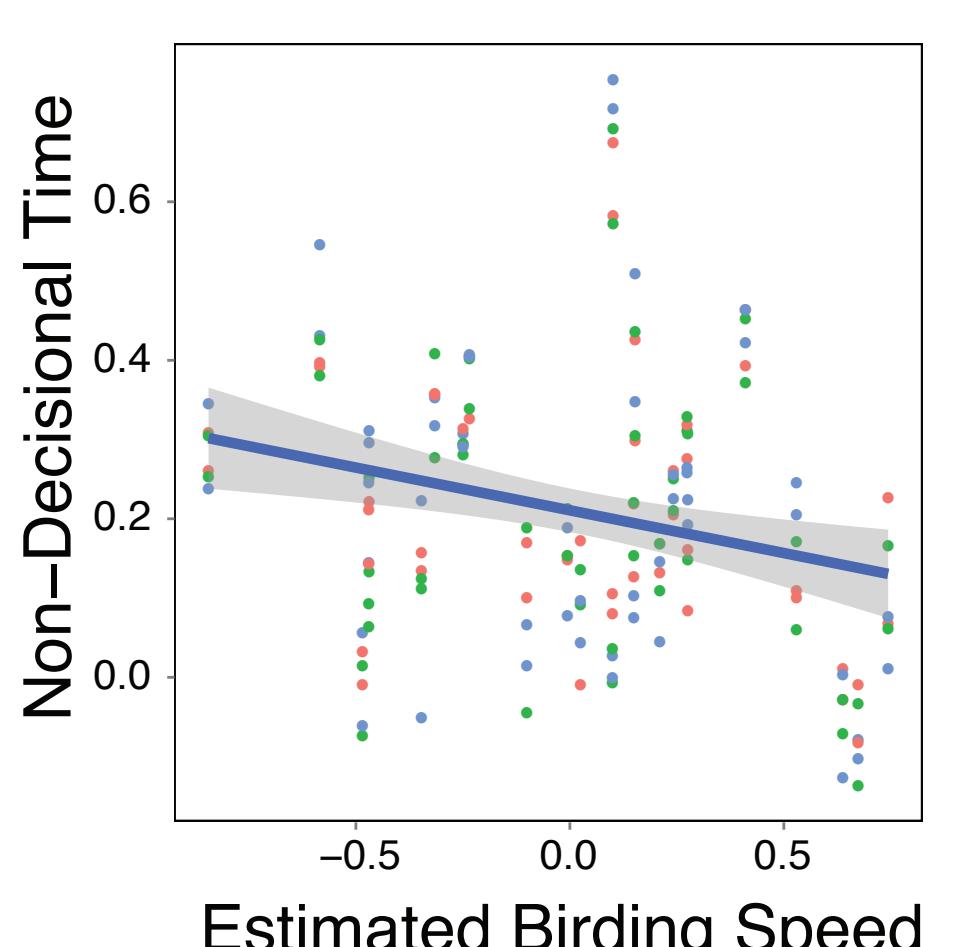
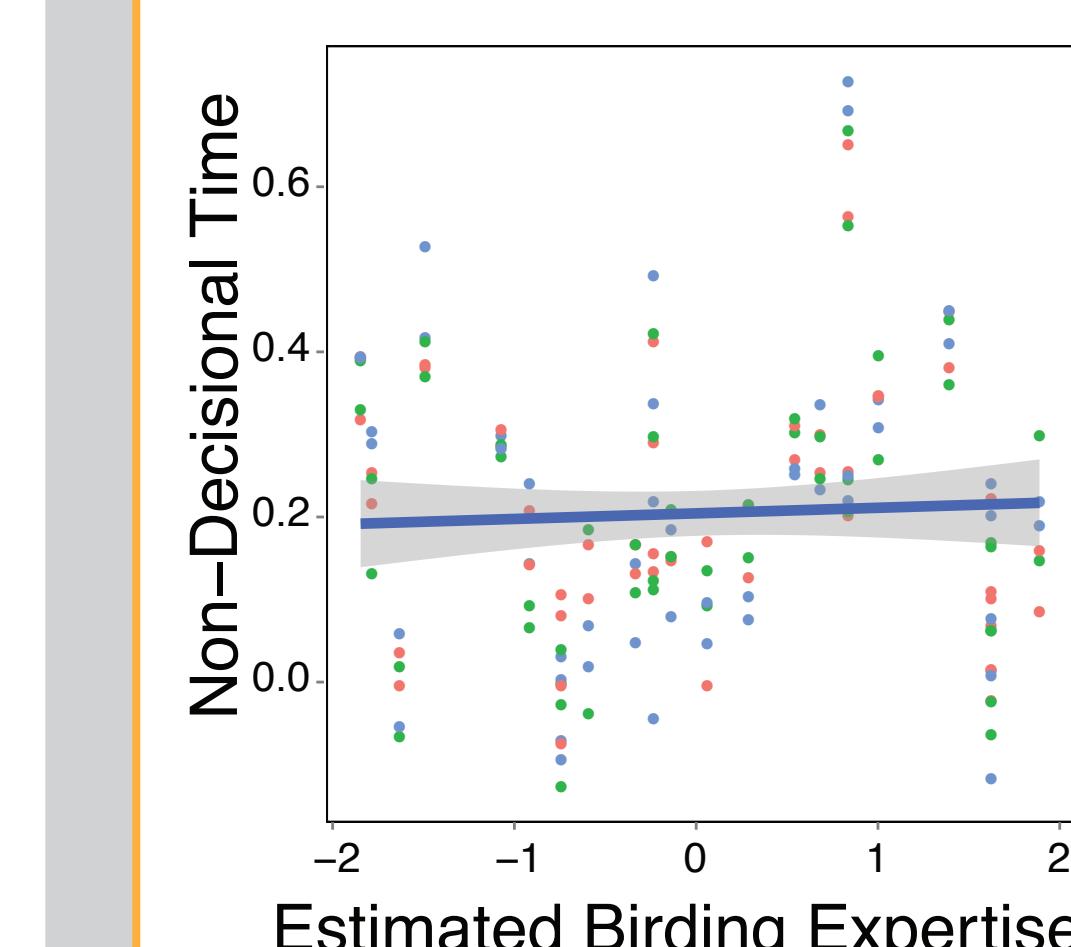
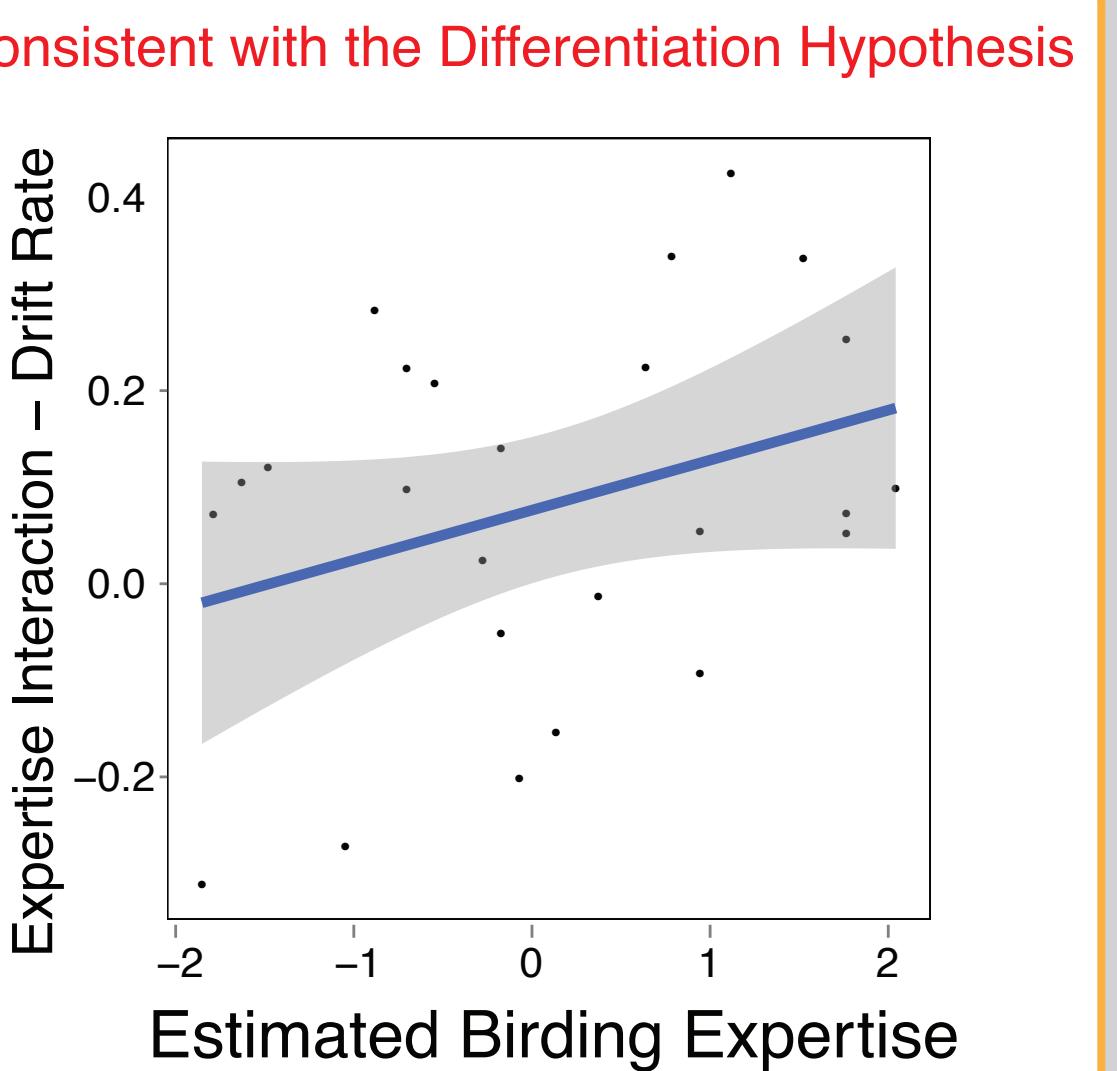
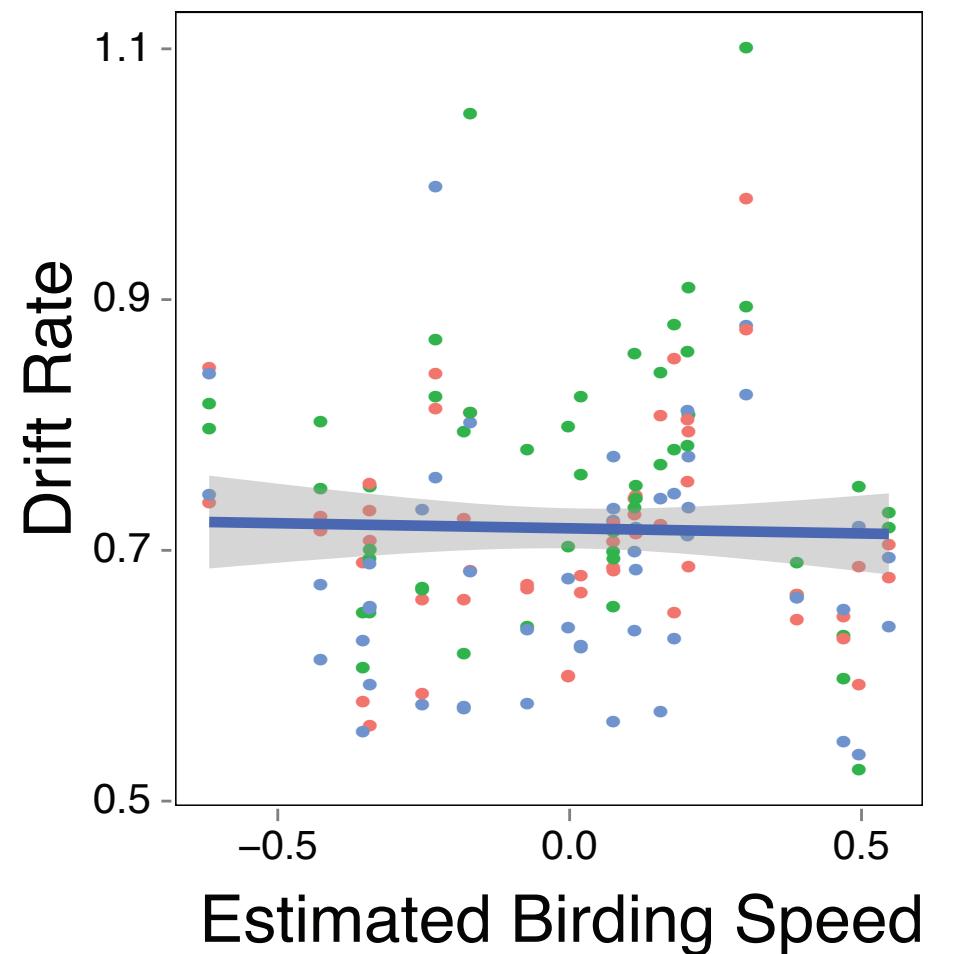
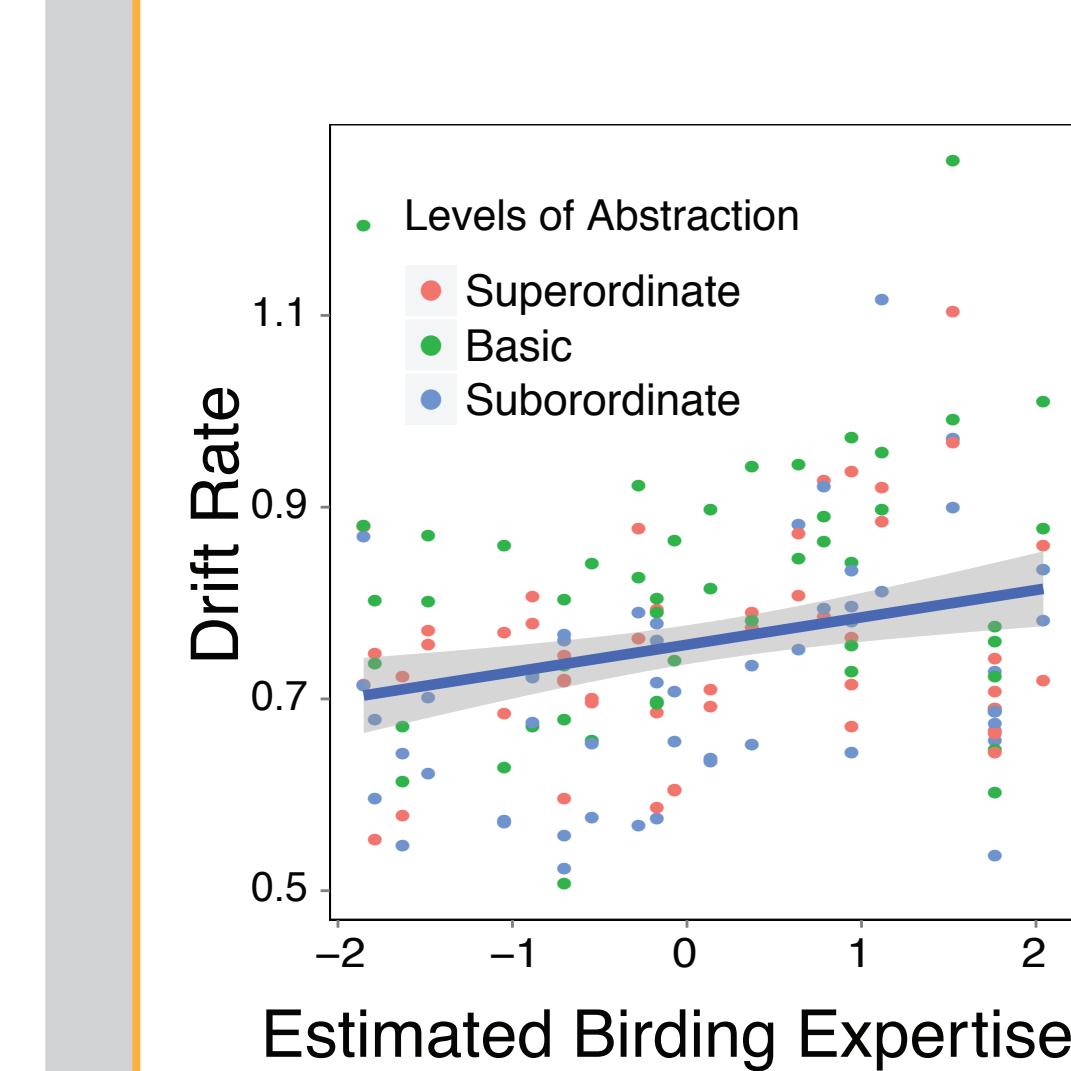
Example of Novice Level Item  
1. Swainson's Thrush 2. Song Sparrow  
3. Lazuli Bunting 4. American Robin

Example of Expert Level Item  
1. Canyon Wren 2. Rock Wren  
3. Winter Wren 4. Sedge Wren

Item Information:  
94 items of varying difficulty;  
Difficult items have  
more confusing distractors,  
less distinctive birds,  
less common birds,  
or female image.

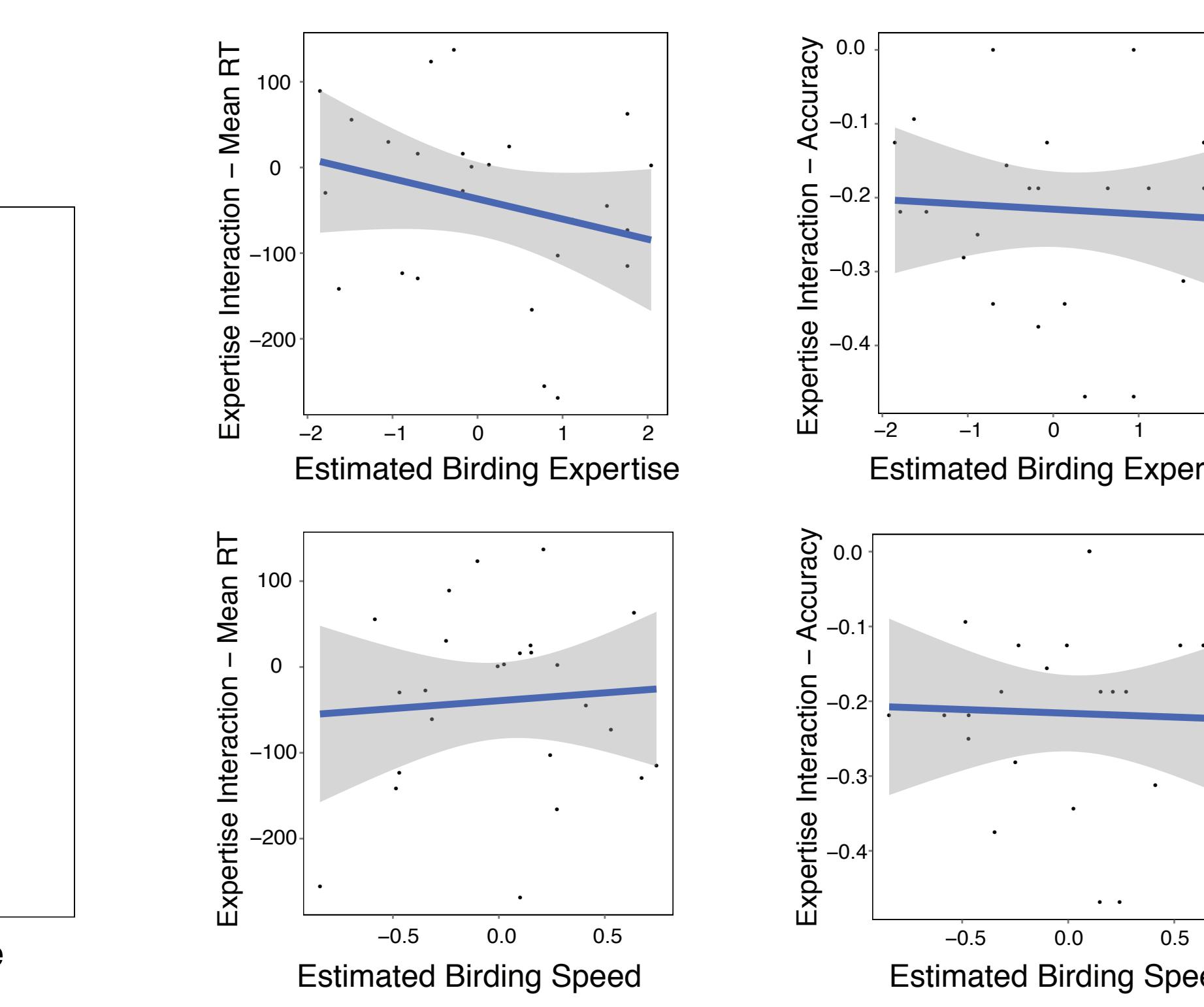
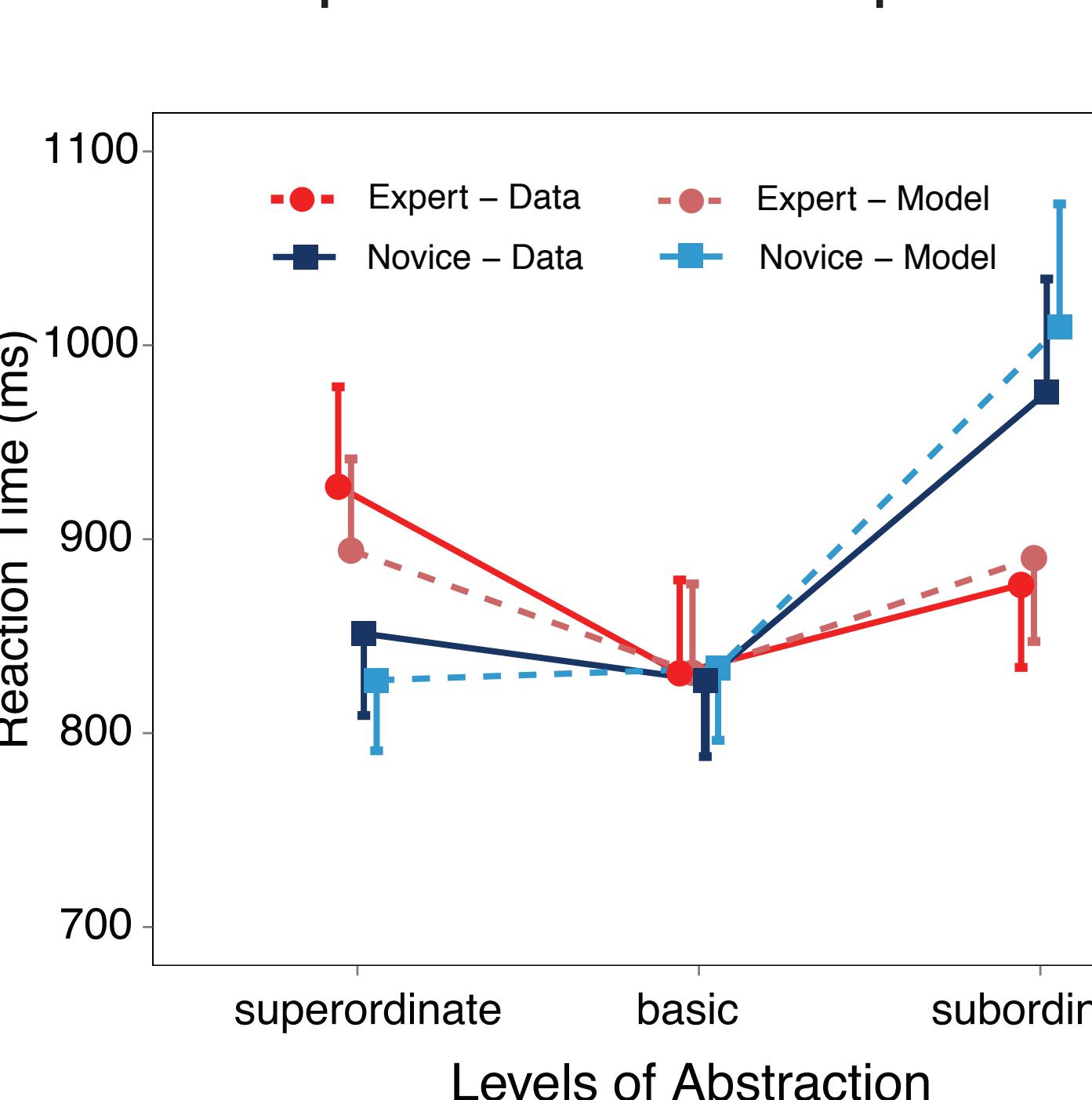


## Modeling Results



## Behavioral Results

### Expertise Effect Replicated



## Conclusions

We replicated the expertise effect in the speeded category verification task online,  $\text{expert (subordinate - basic)} \neq \text{novice (subordinate - basic)}$ . Birding expertise measured from our psychometrically validated test can predict this expertise effect both behaviorally and theoretically. Theoretically, this expertise effect is reflected in the drift rate parameter, but not the non-decisional time parameter, which supports the differentiation hypothesis.

### References

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### Acknowledgements

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