

Supplementary material for:

Teaching and understanding of quantum interpretations in modern physics courses

Charles Baily and Noah D. Finkelstein

The following graphs contain data collected from additional semesters of the PHYS3 courses described in the associated paper. They serve to corroborate the findings of **Figs. 6** and **7**, providing suggestive trends in the relationship between instructional practices and student perspectives on quantum mechanics.

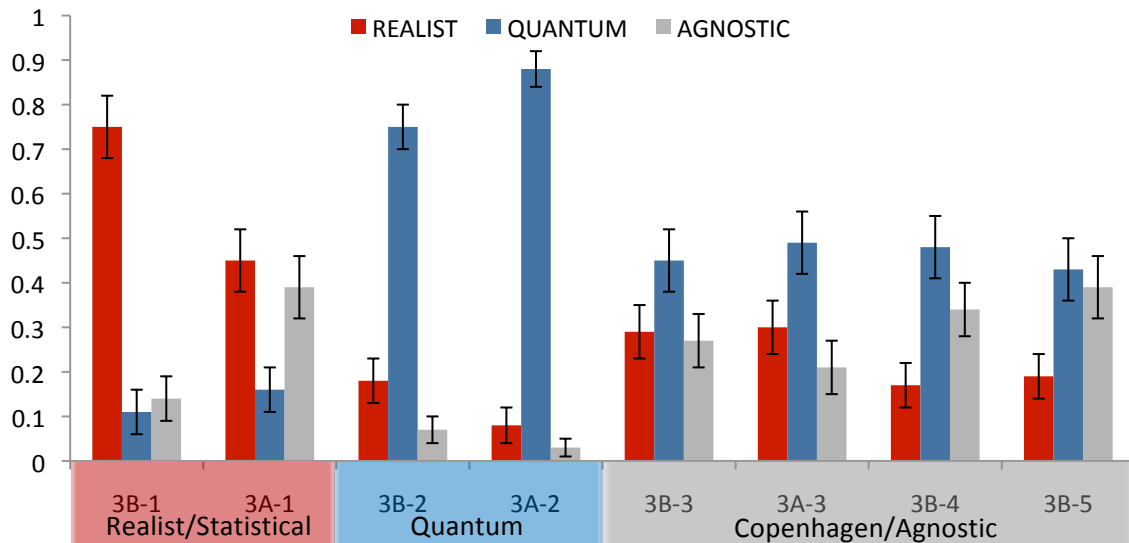


Figure S1 (color): Supplement to **Fig. 6** from main text. This figure shows the distribution of student responses to the double-slit essay question for eight different offerings of the PHYS3A&B modern physics courses; semesters are grouped by color (red, blue, gray) to indicate the instructional approaches for that semester (Realist/Statistical, Quantum, Copenhagen/Agnostic). Instructional approaches were characterized based on classroom observations, faculty interviews, and a review of course materials. Error bars represent the standard error on the proportion. Statistically significant differences in student responses across semesters demonstrate impacts associated with varying instructional approaches. Students from courses taught from a Realist/Statistical perspective were more likely to prefer the Realist interpretation of the double-slit experiment than any of the other modern physics sections. Students from courses where a matter-wave perspective was explicitly taught overwhelmingly chose the Quantum interpretation. Students from the Copenhagen/Agnostic courses are, in general, more evenly split among perspectives, and are among the most likely to prefer the Agnostic perspective.

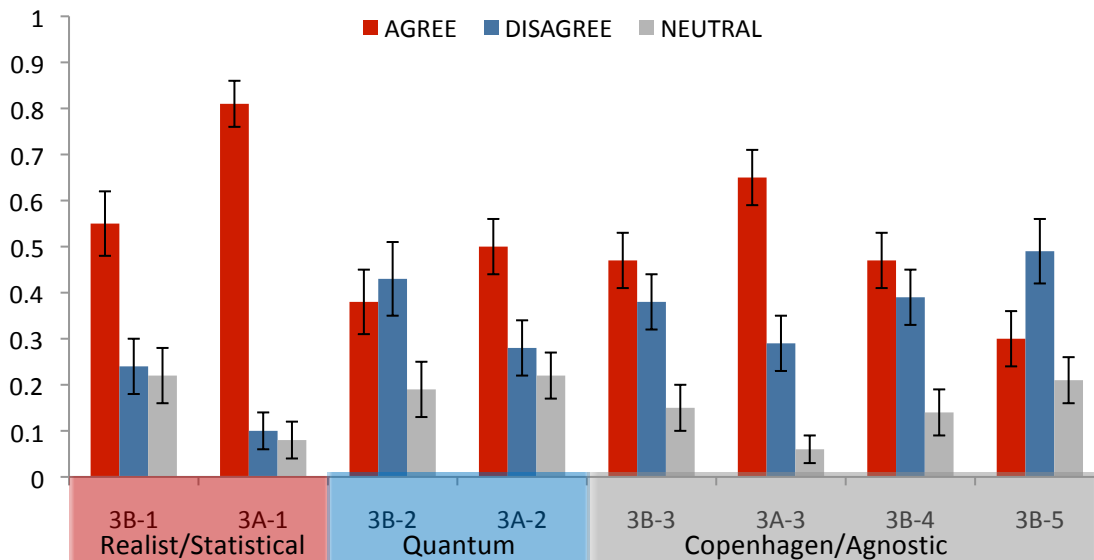


Figure S2 (color): Supplement to **Fig. 7** from main text. This figure shows the distribution of post-instruction student responses from eight different offerings of the PHYS3A&B modern physics to the statement: “An electron in an atom exists at a definite (but unknown) position at each moment in time.” Semesters are grouped by color (red, blue, gray), as in **Fig. S1**, to indicate the instructional approaches for that semester (Realist/Statistical, Quantum, Copenhagen/Agnostic). Error bars represent the standard error on the proportion. Here, trends associated with instructional approaches are clear for the realist/statistical approaches, but less obvious for the other semesters. Students from the Realist/Statistical courses were more likely to select a response that would be consistent with a Realist perspective on atomic electrons; students from the Quantum and Copenhagen/Agnostic courses were, in general, more evenly split among perspectives.