Supplemental Material

Barnes *et al.*

Section 1: Rubric used in study 1 for categorizing student responses to the prompt "*List any religious ideas you think a person has to reject for them to accept evolution. List as many things as you can think of.***"**

1. **Biblical Literalism:** Student says one must reject a literal interpretation of Biblical/religious stories in order to accept evolution.
    a. **Noah's Ark:** Student says one must reject the story of Noah's Ark
    b. **Creation happened in a matter of days**: Student says creation happened in 3-7 days, could also say things like the biblical "timeline" etc.
    c. **The literal Biblical story of Adam and Eve**: This includes responses in which the student says that one must reject the story of Adam and Eve to accept evolution, examples include "the story of Adam and Eve", "Adam and Eve were real people", "Adam and Eve were made first before other animals", or "women came from a man".
    d. **The earth is young**: Student says that one must reject that the earth is thousands rather than billions of years old.
    e. **Special Creationism:** Student says that one must reject special creationism, divine creationism, that all organisms were created separately from one another, that organisms were created perfectly, that organisms were created spontaneously, or that all organisms were created at the same time or in their current form. Only include responses in which it is clear that student means that one must reject that organisms were created *in their current form by a God/god(s)*. Does not include responses in which students say vaguely "must reject that God created".
    f. **Dinosaurs:** Student says that one has to reject that dinosaurs are still alive/lived with humans at some point.
    g. **The earth is flat:** Student says one must reject that the earth is flat.
2. **Existence/Influence of God, the Supernatural, and Religion**
    a. **God**: Student says one must reject God, Jesus, a higher power, Allah, or other gods
    b. **God influences the world/controls things**: Student says that one must reject that God planned our lives, that God influences our lives, that God answers prayers, or that miracles happen, etc.
    c. **God planned/guided evolution**: Student says that one must reject any influence of God on evolution like guiding, planning, or starting evolution.
    d. **Afterlife**: Student says that one must reject that there is an afterlife. This includes reincarnation, the soul, and heaven and hell.
    e. **God created**: Student says that one has to reject that God created the universe, life, humans, Earth, species etc. This includes when the student says one has to reject that "God created everything" or that "God is the reason for everything".
    f. **Religion:** Student says that one must reject the Bible/religion/religious ideas in general in order to accept evolution.

Section 2: Study 1 regression tables and histograms

Table: regression results for self-defined evolution acceptance. Step 1: (F(9,1060) = 54.22, p < .000), Adjusted R square = .31

	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
Step 1:					
(Constant)	104.136	5.237		19.885	.000
GPA	4.154	1.353	.080	3.069	.002
Biology Major	2.426	1.653	.038	1.468	.142
Gender	1.098	1.523	.019	.721	.471
Black	-7.714	3.934	-.051	-1.961	.050
Hispanic	2.814	2.115	.036	1.331	.184
Asian	2.421	2.318	.028	1.045	.296
Other/Multiple/No Answer	1.548	2.141	.020	.723	.470
Religiosity	-11.653	.606	-.497	-19.236	.000
Atheistic Perception of Evolution	-12.990	1.500	-.223	-8.662	.000
Step 2 testing interaction					
(Constant)	88.061	5.421		16.243	.000
GPA	4.679	1.313	.090	3.565	.000
Biology Major	2.971	1.602	.046	1.854	.064
Gender	1.176	1.475	.020	.798	.425
Black	-7.800	3.811	-.052	-2.047	.041
Hispanic	3.089	2.049	.040	1.508	.132
Asian	2.369	2.245	.027	1.055	.292
Other/Multiple/No Answer	2.062	2.075	.026	.994	.320
Religiosity Full Measure	-6.939	.812	-.296	-8.549	.000
Atheistic Perception of Evolution	15.789	3.719	.271	4.245	.000
Atheistic Perception X Religiosity	-9.733	1.158	-.576	-8.405	.000

Table: regression results for human evolution acceptance. Step 1: (F(9,1060) = 57.27, p < .000), Adjusted R square = .32

	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
Step 1:					
(Constant)	4.786	.164		29.161	.000
GPA	.108	.042	.066	2.539	.011
Biology Major	.092	.052	.045	1.779	.076
Gender	-.011	.048	-.006	-.233	.816
Black	-.022	.123	-.005	-.177	.859
Hispanic	.049	.066	.020	.746	.456
Asian	-.013	.073	-.005	-.182	.855
Other/Multiple/No Answer	-.029	.067	-.012	-.430	.667
Religiosity	-.413	.019	-.557	-21.760	.000
Atheistic Perception of Evolution	-.211	.047	-.115	-4.494	.000
Step 2 testing interaction					
(Constant)	4.638	.175		26.501	.000
GPA	.113	.042	.069	2.656	.008
Biology Major	.097	.052	.048	1.878	.061
Gender	-.010	.048	-.006	-.218	.827
Black	-.023	.123	-.005	-.184	.854
Hispanic	.052	.066	.021	.786	.432
Asian	-.014	.072	-.005	-.190	.850
Other/Multiple/No Answer	-.024	.067	-.010	-.360	.719
Religiosity	-.370	.026	-.499	-14.110	.000
Atheistic Perception of Evolution	.054	.120	.029	.447	.655
Atheistic Perception X Religiosity	-.090	.037	-.168	-2.397	.017

Table: regression results for macroevolution acceptance. Step 1: (F(9,1060) = 42.02, p < .000), Adjusted R square = .26

	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
Step 1:					
(Constant)	4.642	.144		32.204	.000
GPA	.085	.037	.062	2.282	.023
Biology Major	.118	.045	.069	2.589	.010
Gender	-.014	.042	-.009	-.338	.736
Black	-.024	.108	-.006	-.224	.823
Hispanic	.042	.058	.020	.720	.471
Asian	.037	.064	.016	.575	.566
Other/Multiple/No Answer	-.032	.059	-.015	-.540	.589
Religiosity	-.303	.017	-.488	-18.197	.000
Atheistic Perception of Evolution	-.213	.041	-.138	-5.171	.000
Step 2 testing interaction					
(Constant)	4.461	.153		29.098	.000
GPA	.091	.037	.066	2.449	.014
Biology Major	.124	.045	.073	2.735	.006
Gender	-.013	.042	-.008	-.318	.751
Black	-.025	.108	-.006	-.234	.815
Hispanic	.045	.058	.022	.777	.437
Asian	.036	.063	.016	.568	.570
Other/Multiple/No Answer	-.026	.059	-.012	-.444	.657
Religiosity	-.250	.023	-.402	-10.907	.000
Atheistic Perception of Evolution	.110	.105	.071	1.050	.294
Atheistic Perception X Religiosity	-.110	.033	-.244	-3.345	.001

Table: regression results for microevolution acceptance. Step 1: (F(9,1060) = 34.41, p < .000), Adjusted R square = .24

	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
Step 1:					
(Constant)	4.463	.134		33.199	.000
GPA	.141	.035	.113	4.071	.000
Biology Major	.135	.042	.087	3.192	.001
Gender	-.037	.039	-.026	-.942	.346
Black	-.283	.101	-.078	-2.807	.005
Hispanic	.011	.054	.006	.195	.846
Asian	-.091	.059	-.044	-1.536	.125
Other/Multiple/No Answer	-.044	.055	-.023	-.797	.425
Religiosity	-.237	.016	-.418	-15.230	.000
Atheistic Perception of Evolution	-.187	.038	-.133	-4.852	.000
Step 2 testing interaction					
(Constant)	4.239	.142		29.769	.000
GPA	.149	.034	.119	4.314	.000
Biology Major	.143	.042	.092	3.398	.001
Gender	-.036	.039	-.025	-.922	.357
Black	-.285	.100	-.079	-2.844	.005
Hispanic	.014	.054	.008	.267	.789
Asian	-.092	.059	-.044	-1.561	.119
Other/Multiple/No Answer	-.037	.054	-.019	-.673	.501
Religiosity	-.171	.021	-.303	-8.034	.000
Atheistic Perception of Evolution	.213	.098	.152	2.184	.029
Atheistic Perception X Religiosity	-.135	.030	-.332	-4.449	.000

Section 3: Process for adapting survey used in Study 2 to identify students' personal views of evolution and religion as well as what they thought was the most accurate scientific definition of evolution.

We adapted a previously published instrument to identify students' personal views of evolution and religion as well as what they thought was the most accurate scientific definition of evolution. The original published instrument (Yasri & Mancy, 2016) was validated through prior literature and expert review but was not vetted for readability among students, so we revised the scale based on think aloud interviews conducted with 25 undergraduate biology students. The wording for several items on the instrument was revised because students did not understand or misinterpreted the terminology of items. For example, we changed the label "Higher Genera Creationism" to "Creationism with Some Evolution" because students often did not understand what was meant by "High Genera". Further, students who chose "Theistic Evolution" explained having different views; some students believed God actively intervened in evolution while other students believed evolution was planned and started by God but that God did not actively intervene in evolution. Therefore, we added a new option "Interventionist Evolution" for students who believe God actively intervenes and guides evolution and redefined "Theistic Evolution" as "All forms of life evolved from earlier forms, but God set up evolution from the start in a perfect way so that it would fulfill God's purpose and no subsequent intervention was necessary."

Section 4: Development and validation of survey items used in Study 2 to measure student perceived conflict between religion and evolution and student comfort while learning evolution.

We created two new instruments to measure student comfort learning evolution and their perceived conflict between their personal religious beliefs and evolution. We created the items for both instruments based on prior literature examining the experiences of religious students learning about evolution in college (Barnes & Brownell, 2018; Barnes, Truong, & Brownell, 2017; Truong, Barnes, & Brownell, 2018; Winslow, Staver, & Scharmann, 2011; Manwaring, Jensen, Gill, & Bybee, 2015). To make sure the items we created were clear and interpreted by students correctly, a researcher conducted think aloud interviews with 25 students and asked the students to reword the questions and to think aloud as they answered the questions. Items were revised iteratively based on student feedback.

We conducted analyses to explore the reliability and construct validity of the perceived conflict and comfort learning evolution instruments. We found that both instruments had high internal reliability (comfort learning evolution α = .91; perceived conflict α = .91) and acceptable inter-item correlation ranges (comfort learning evolution r = .42 - .72; perceived conflict r = .64 - .84). Principal components analysis revealed a single factor among the perceived conflict items; a visual analysis of a scree plot confirmed a single factor, all items loaded onto a single factor (factor loadings = .67 - .86), and 79% of variance was explained by a single factor. Principal components analysis also revealed a single factor among items measuring comfort learning evolution; a visual analysis of the scree plot confirmed a single factor, all items loaded onto a single factor (factor loadings = .64 - .84), and one component explained 62% of variance.
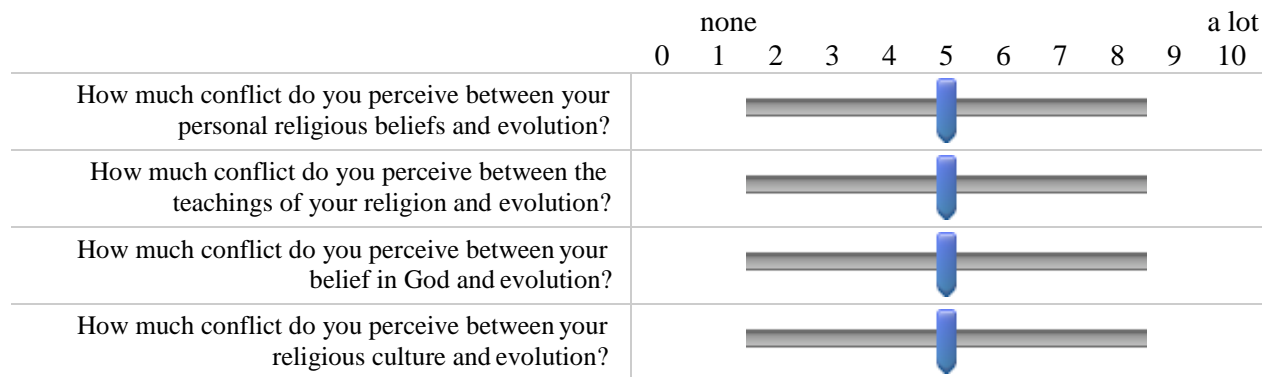
Final instrument used to measure student comfort while learning evolution.

Students answered on a 6-pt Likert scale from strongly disagree – strongly agree.

This portion of the survey is meant to determine how comfortable you felt while learning evolution in this course. Please indicate how much you agree or disagree with the following statements, based on your evolution instruction in this course:

1. I felt like I belonged in the classroom while I was learning evolution.
2. I felt alienated from the rest of the class while I was learning evolution.
3. I felt comfortable talking to my peers about my views on evolution and religion.
4. I was worried to share my personal views on evolution and religion with the class while learning evolution.
5. I felt like I could discuss my views on evolution and religion with the instructor.
6. I felt uncomfortable while I was learning evolution.
7. I felt comfortable while I was learning evolution.
8. I felt respected while I was learning evolution.

Final instrument used to measure student perceived conflict between their religious beliefs and evolution:

	none										a lot
	0	1	2	3	4	5	6	7	8	9	10
How much conflict do you perceive between your personal religious beliefs and evolution?											
How much conflict do you perceive between the teachings of your religion and evolution?											
How much conflict do you perceive between your belief in God and evolution?											
How much conflict do you perceive between your religious culture and evolution?											

Section 5: regression tables for study 2

Table: regression for microevolution acceptance (F(3,282) = 2.67, p = .047), Adjusted R square = .02

	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
Step 1:					
(Constant)	4.218	.069		60.774	.000
Gender	.001	.072	.001	.012	.991
Biology Major	.099	.070	.084	1.420	.157
Atheistic Perception of Evolution	-.167	.069	-.142	-2.411	.017

Table: regression for macroevolution acceptance (F(3,282) = 5.227, p = .002), Adjusted R square = .04

	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
Step 1:					
(Constant)	3.659	.085		43.167	.000
Gender	.019	.088	.013	.219	.827
Biology Major	.237	.085	.163	2.783	.006
Atheistic Perception of Evolution	-.228	.085	-.157	-2.694	.007

Table: regression for human evolution acceptance (F(3,282) = 3.541, p = .015), Adjusted R square = .03

	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
Step 1:					
(Constant)	3.525	.109		32.235	.000
Gender	.007	.113	.004	.063	.950
Biology Major	.113	.110	.061	1.025	.306
Atheistic Perception of Evolution	-.334	.109	-.180	-3.059	.002

Table: regression for self-defined evolution acceptance (F(3,282) = 4.674, p = .003), Adjusted R square = .04

	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
Step 1:					
(Constant)	7.279	.313		23.254	.000
Gender	-.151	.323	-.027	-.466	.642
Biology Major	.667	.315	.124	2.118	.035
Atheistic Perception of Evolution	-.941	.313	-.176	-3.010	.003

Table: regression for comfort learning evolution (F(3,282) = 4.840, p = .003), Adjusted R square = .04

	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
Step 1:					
(Constant)	4.985	.118		42.201	.000
Gender	-.176	.122	-.085	-1.441	.151
Biology Major	.179	.119	.088	1.506	.133
Atheistic Perception of Evolution	-.377	.118	-.186	-3.191	.002

Table: regression for perceived conflict between religion and evolution (F(3,281) = 10.973, p < .001), Adjusted R square = .10

	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
Step 1:					
(Constant)	104.136	5.237		19.885	.000
Gender	4.154	1.353	.080	3.069	.002
Biology Major	2.426	1.653	.038	1.468	.142
Atheistic Perception of Evolution	-12.990	1.500	-.223	-8.662	.000