

Survey of Evolutionary Scholars and Students: Perceptions of Progress and Challenges

Daniel J. Kruger

School of Public Health, University of Michigan, Ann Arbor

Maryanne L. Fisher

Department of Psychology, St. Mary's University

Steven Platek

Department of Psychology, Georgia Gwinnett College

Catherine Salmon

Department of Psychology, University of Redlands

ABSTRACT

We created the first large survey of those involved in the evolutionary approach to human research regarding their perceptions on the state of this approach. Our objective was to assess scholars' perceptions of academic standing, career issues, challenges facing evolutionary scholars, and to gauge the academic strength and productivity of human evolutionary researchers. We did not attempt to gauge the theoretical progress of the approach as a science or its relative representation objectively, though we did collect participants' perceptions of scientific progress and challenges. We compiled a recruitment database of e-mails based on presenters at three iterations of three prominent evolutionary conferences (2008-2010) and sent personalized invitations to participate in an on-line survey. Participants (N = 297) gave detailed information on their perceptions, challenges, hopes, and expectations for the future. Overall, participants were optimistic in their views that evolutionary research would become more accepted and prominent, although they tended to believe that growth and advancement of the field would be a gradual process. Participants' strongest concerns and recommendations for those taking an evolutionary approach to human research focused on maintaining theoretical rigor, increasing methodological sophistication, utilizing interdisciplinary approaches with convergent data from multiple methodologies, and testing competing evolutionary hypotheses against each other. Several specifically cited concerns regarding misunderstandings resulting from simplistic accounts of sex differences in mating, whether by researchers or media covering this research. Participants were very

AUTHOR NOTE: Please direct correspondence to Daniel J. Kruger, School of Public Health, 1420 Washington Heights, Ann Arbor, MI 48109-2029. E-mail: kruger@umich.edu

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positive about the theoretical strengths of the evolutionary approach, yet they were more wary regarding the general lack of knowledge about evolution and resistance based on ideological grounds.

KEYWORDS

Evolution, Psychology, Anthropology, Expectations, Challenges, Survey

INTRODUCTION

In *On the Origin of Species by Means of Natural Selection*, Darwin (1859, p. 428) gave an ambitious vision, “in the distant future I see open fields for far more important researches. Psychology will be based on a new foundation, that of the necessary acquirement of each mental power and capacity by gradation. Much light will be thrown on the origin of man and his history.” One and a half centuries after Darwin's book forever changed the life sciences, evolutionists are active in the scientific study of humans, although they do appear to constitute a minority in their disciplines.

How do we gauge our progress as a field? There are several complementary ways to document the growth of a discipline, and to predict its future trajectory. Previous research has quantified progress in terms of journal citations and Google Scholar hits. E. O. Wilson's (1975) book, *Sociobiology*, was followed by a dramatic increase in the term “sociobiology” appearing in the scientific literature, and Barkow, Cosmides, and Tooby's edited book (1992), *The adapted mind: Evolutionary psychology and the generation of culture*, was associated with a similar increase in the use of the term “evolutionary psychology” (Webster, 2007a). Between 1985 and 2004, keywords related to evolution and Darwin steadily increased in the American Psychological Association's flagship journal, *Journal of Personality and Social Psychology* (Webster, 2007b). This trend continued in the following five years and was also seen in the Association for Psychological Science's flagship journal, *Psychological Science* (Peterson & Kruger, 2009). By 2009, articles based on an evolutionary framework comprised about 2% of the articles in the *Journal of Personality and Social Psychology* and about 3% of the articles in *Psychological Science* (Peterson & Kruger, 2009). The utilization of evolutionary theory may be increasing even faster in neuroscience compared to social and personality psychology (Webster, 2007c).

Special commentary issues of journals such as *Futures* (2011, Volume 43), *Psychological Science Agenda* (2009, Volume 23), and *Psychological Topics* (2006, Volume 15) have detailed how active researchers perceive progress in the field and detail their expectations for future directions. We have previously shared our experiences as individual researchers (Fisher, Goetz, Hill, Kruger, Michalski, Osipowicz, Platek, & Salmon, 2009; Fisher, Kruger, Platek, & Salmon, 2004), detailing the similarities and differences in our student and career experiences and offering insights to colleagues and students.

It is also useful to examine the perspectives of other researchers through surveys. This type of project can build on previous qualitative and ideographic papers that detail individual experiences in an attempt to quantify aggregate trends. Glass, Wilson, and Geher (2012) surveyed 27 authors of evolution-themed articles in *Behavioral and Brain Sciences* with seven questions to assess the state of evolutionary training at their previous and current institutions. Most of these authors revealed that their graduate training had scarce content on evolution, especially as it relates to human behavior, and that much of their own self-education occurred after completing their PhDs. They also generally reported that it would be difficult for faculty and students at their current institutions to receive evolutionary training.

In this paper, we report the results from the first large-scale survey on the state of evolutionary research focused on humans. We assessed scholars' perceptions of academic and career issues, and the challenges they face. We also surveyed scholars' views on the level of interest and understanding among students and the general public, and asked them to reflect on the academic strength and productivity of human evolutionary research. We do not attempt to assess the progress of the theoretical approach itself as an explanatory framework, as this has been addressed in part by previous work such as the studies of journal citations listed above. Sophisticated qualitative and quantitative examinations of theoretical maturation in future projects with different methodologies would be better assessments.

In the current study, we rely upon analyses of the aggregated experiences and perceptions of approximately 300 scholars and students. We ask: What are the challenges faced by these scholars? How have they made inroads into their scientific fields, and what are their career experiences? To address these questions, and others, we surveyed those working within human evolution and behavior.

We fully recognize that evolutionary theory is a theoretical framework for informing all branches of life science, rather than an evolutionary approach as a sub-discipline somehow separate from other parts of a field (see Buss, 2009). Yet, those conducting research with hypotheses generated from an evolutionarily informed theoretical framework constitute a minority in the fields of scientific research on humans. For example, there are specific conferences that pertain to use of evolutionary theory to understand human behavior, just as there are particular journals devoted to this topic. Thus, we often frame evolutionary research on human psychology and/or behavior as a distinct field to facilitate participants' assessments. We recognize that this approach is limited in that there are scholars who use an evolutionary framework to study human behavior who do not attend these conferences or who we might not have found based on departmental faculty websites, however active researchers not visible by these means are likely small in number.

METHODS

We compiled a recruitment database of e-mails based on presenters at evolutionary conferences and faculty web pages. These conferences included the regular meetings and summer institutes of the Human Behavior and Evolution Society (HBES), the International Society for Human Ethology (ISHE), and the

NorthEastern Evolutionary Psychology Society (NEEPS) held during the years 2008-2010. Research assistants (RAs) searched the academic web pages of faculty members and graduate students (when available) at all North American four-year colleges and universities listed in Wikipedia and/or U.S. News and World Report's 2010 college rankings. The departments that were reviewed included Psychology, Anthropology, Biology and their less regular counterparts (e.g., Behavioral Sciences, Social Sciences). Those expressing interests in Evolutionary Psychology, Evolutionary or Darwinian Anthropology, or who made other references to evolution and human psychology and/or behavior were included. RAs e-mailed potential participants individually from a Gmail address specially created for the study. Recipients were encouraged to forward the survey invitation to appropriate individuals. We created an on-line survey with Qualtrics and collected data from October 5, 2010 to April 16, 2011. Near the end of data collection, we sent a second request for participation. We generated a quantitative and qualitative report for each survey item.

Participants

Participants ($N = 297$) were located in North America (67.3%; 60.5% USA, 6.8% Canada), Europe (22.6%; 6.4% UK, 3.3% Netherlands, 2.8% Germany, 2.3% Italy, 1.8% Austria, 1% Belgium, 1% Sweden, and 0.5% each in Croatia, Czech Republic, Norway, Poland, Russia, Serbia, Slovak Republic, and Spain), Pacific (6.5%; 3.2% Japan, 1.8% Australia, 0.5% New Zealand, 0.5% China, 0.5% Singapore), South America (4.1%; 3.6% Brazil, 0.5% Chile), and South Africa (0.5%). Participants were 65% men, 35% women, and ranged in age from 20 to 82 years ($M = 40.05$, $SD = 12.78$). Respondents who were not currently students had worked in an average of 1.82 different institutions since obtaining their highest degree ($SD = 1.04$, range: 0-7).

Participants were predominantly current faculty (56%; 40% tenure track, 16% non-tenure track) and graduate students (30%). Nearly three-quarters (73%) of participants reported being at a Doctoral level university, 17% at a Masters Level College or University, and 5% at a Liberal Arts College or University. Those individuals not in academia ("Other") included a clinical psychologist, someone working at a research institute, an honorary research associate and writer, and a self-described "amateur." A little over half of respondents reported their major field of study as Psychology (56.1%), followed by Anthropology (23.6%) and Biology (8%). No more than 2% of respondents represented any other field. Participants' current departmental affiliations were also predominantly consistent with their major field of study; Psychology (49%), Anthropology (22%), and Biology (7%).

RESULTS

Section 1: Experiences with evolutionary research

The year participants began conducting or collaborating in academic research in general ranged from 1950 to 2011. Twenty five percent of participants were involved in research by 1992, 50% by 1999, and 75% by 2004. The year

participants were first exposed to an evolutionary perspective on human psychology and/or behavior ranged from 1956 to 2009; 25% of participants were exposed by 1992, 50% by 1999, and 75% by 2003. The year participants began conducting or collaborating in academic research from an evolutionary perspective ranged from 1962 to 2011; 25% of participants were involved in evolutionary research by 1996, 50% by 2002, and 75% by 2005. On average, there was a three year-period between when participants began academic research and when they began academic research from an evolutionary perspective ($M = 3.44$, $SD = 6.27$, Range: 0-33). This length of this lag between research initiation and adopting an evolutionary perspective has been decreasing every year, $r(277) = -.594$, $p < .001$.

Just over half of participants (56%) were introduced to evolutionary research on human psychology and/or behavior through academic coursework (see Table 1). Nearly half (44%) of participants were exposed to evolutionary research through an undergraduate course, with 12% more exposed through a graduate course. The other most cited form of introduction was a book or article read outside of coursework. "Other" forms of introduction were through friends or family members, participating in a research study, attending a lecture by William D. Hamilton, one participant remarked, "No one was doing empirical research on EP when I starting doing it. I was influenced, though, by books by Symons, E.O. Wilson, and of course the key papers and chapter by Robert Trivers."

Table 1. How did you first hear about evolutionary research on human psychology and/or behavior?

How did you first hear about evolutionary research on human psychology and/or behavior?		
Response	n	%
Undergraduate course	131	44.4
Book or article not read for a course	81	27.5
Graduate course	34	11.5
Colleague	22	7.5
Conference	7	2.4
Documentary	4	1.4
News article	3	1
Accidentally while searching for other topics	2	0.7
Website	1	0.3
Other	10	3.4

Participants then estimated the proportion of their evolutionary research conducted collaboratively on a 0-100% scale, yielding an average estimate of 59%. Twenty nine percent of participants stated they conducted 100% of their evolutionary research collaboratively (25%, 50%, and 75% quartiles: 30%, 70%,

90%). The average participant had nine collaborators for evolutionary research projects (25%, 50%, and 75% quartiles: 3, 5, 10 collaborators). On average, participants had three collaborators based in their current institutions (25%, 50%, and 75% quartiles: 0, 2, 4). In terms of distance from collaborators, the average proportion of collaborators who were local was 40%, and 21% of individuals only worked with local collaborators (25%, 50%, and 75% quartiles: 0%, 33%, 67%).

Faculty participants worked with a mean of five graduate students (25%, 50%, and 75% quartiles: 0, 3, 5) and 12 undergraduate students on evolutionary research projects (25%, 50%, and 75% quartiles: 1, 4, 12). Participants also worked with a mean of two graduate students who were primarily supervised by someone else on evolutionary research projects (25%, 50%, and 75% quartiles: 0, 0, 2) and two undergraduate students (25%, 50%, and 75% quartiles: 0, 0, 1).

Participants were asked to answer the question “What attracted you to the evolutionary perspective?” Their responses fit into several categories. For many it was the “big picture,” interdisciplinarity and consilience, a functional approach to examining behavior (including answering “Why?” questions), integrating proximate and ultimate explanations, parsimony, and explanatory and predictive power. As one respondent noted, “It helped catalyze grudges and disappointments I had felt with my field for a long time, providing me with a common sense perspective that seemed relevant to my disciplinary realities.” Another respondent remarked, “Evolution is the unifying theory of all life sciences. It is empirically true, whereas theories commonly used in social sciences are frequently empirically false.” Many participants included a remark that an evolutionary approach “makes sense,” sometimes in contrast to other frameworks. For example, “It made sense of the world in a way that no other paradigm to which I had been exposed was capable of matching; once exposed I couldn't see the world any other way.” Many respondents have backgrounds that include biological approaches and the comparative method. Others were attracted by the work of specific researchers, including Darwin, William Hamilton, Konrad Lorenz, and Nikolas Tinbergen, as well as contemporary scholars such as Richard Dawkins, John Tooby and Leda Cosmides, Don Brown, Don Symons, Steven Pinker, and David Buss. Others noted the specific utility of the perspective for explaining some particular area or question of interest to them such as theory of mind, mating, morality, or risk-taking. The ability to make novel predictions and its unifying potential for psychology were other major attractions. Several participants remarked that adopting an evolutionary framework would be an inevitable feature of scientific progress in the social sciences; for example, one respondent wrote, “It seemed logically inevitable. What other perspective is there?”

Of the 274 participants who reported working with collaborators, two-thirds had met collaborators at their own institution, about half (53%) met collaborators at a conference, and 41% knew their collaborators from graduate school (see Table 2).

Table 2. How did you meet the collaborators that you have worked with? (Check all that apply).

How did you meet the collaborators that you have worked with? (All applicable)		
Response	n	%
They work or worked at my institution	182	66
Conference	144	53
Knew from graduate school	111	41
First contacted via e-mail	92	34
Knew from undergraduate program	42	15
I gave an invited talk at their institution	39	14
They gave an invited talk at my institution	30	11
Colleagues	25	9
Other	29	13

Section 2: Evolutionary research productivity

On average, 73% of participants' research was designed to test evolutionary hypotheses (25%, 50%, and 75% quartiles: 50%, 80%, 100%). Participants had an average of 22 papers ($M = 22.11$, $SD = 38.85$) that were published or in press at peer-reviewed journals, and 89% of participants had at least one publication (25%, 50%, and 75% quartiles: 3, 8, 25). Two-thirds (66%) of these papers were based on evolutionary hypotheses and 31% of participants based all of their papers on evolutionary hypotheses (25%, 50%, and 75% quartiles: 30%, 80%, 100%). Participants reported an average of 13 papers ($M = 12.52$, $SD = 22.45$) based on evolutionary hypotheses that were published or in press at peer-reviewed journals, whereas 85% of participants had at least one publication based on evolutionary hypotheses (25%, 50%, and 75% quartiles: 1, 5, 13).

Participants had an average of 29 presentations ($M = 28.94$, $SD = 42.22$) at academic or professional conferences, and 97% of participants had at least one presentation (25%, 50%, and 75% quartiles: 7, 15, 32). On average, 75% of these presentations were based on evolutionary hypotheses, whereas 38% of participants based all of their papers on evolutionary hypotheses (25%, 50%, and 75% quartiles: 60%, 90%, 100%). Participants reported an average of 18 presentations ($M = 18.37$, $SD = 27.53$) based on evolutionary hypotheses at academic or professional conferences, and 96% of participants had at least one presentation based on evolutionary hypotheses (25%, 50%, and 75% quartiles: 4, 10, 20).

Section 3: Perceptions of support for an evolutionary approach to research

Participants reported mixed views on how supportive external funding agencies were towards academic research that is explicitly testing evolutionary hypotheses. Responses were approximately divided into thirds, such that a third of participants thought that agencies were supportive, indifferent, or hostile (see Figure

1). Participants reported a range of home department attitudes regarding evolutionary research, and although a majority (60%) felt that their department was supportive, 19% considered it indifferent and 20% considered it hostile. A larger proportion of participants thought that those in their field were supportive (56%) rather than hostile (28%) to evolutionary research. The majority of participants (60%) thought that the level of support had been stable over the past five years (see Figure 2); however a larger proportion of participants (32%) thought that funding agencies were becoming more supportive, rather than less supportive (9%). About half (47%) of participants have received external funding to support their evolutionary-based research. The majority of participants (61%) thought that department attitude was stable over the past five years; however, a larger number of participants (34%) thought that departments were becoming more supportive, rather than less supportive (4%).

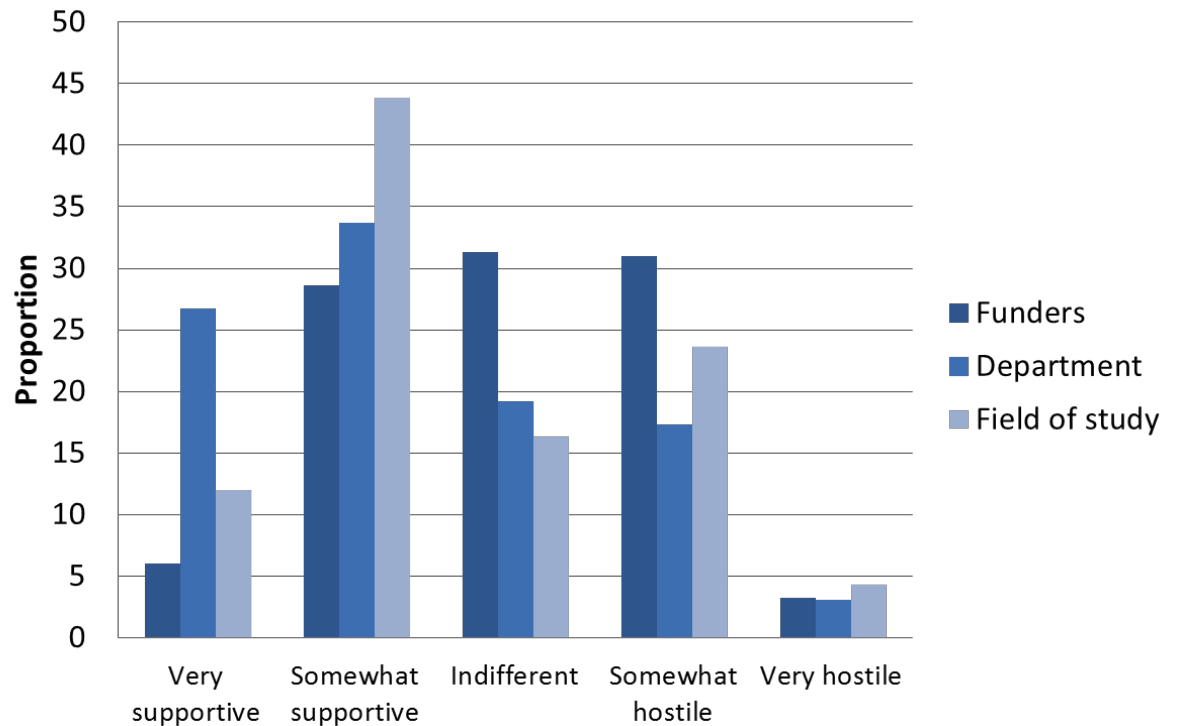


Figure 1. Perceived level of support for evolutionary research on human psychology and behavior across groups.

Departments had an average of 25 faculty members ($SD = 30$, $Md = 20$, range: 0-350). On average, about a third (36%) of faculty members could be considered allies, being either active evolutionary researchers or sympathetic to evolutionary research (and may or may not have a small number of evolutionary projects, see Table 3). The largest portion of faculty was considered indifferent to evolutionary research (41%), and those who were hostile formed the smallest

portion (13%). At least one-quarter of participants reported that one-quarter or more of the faculty in their department were active evolutionary researchers.

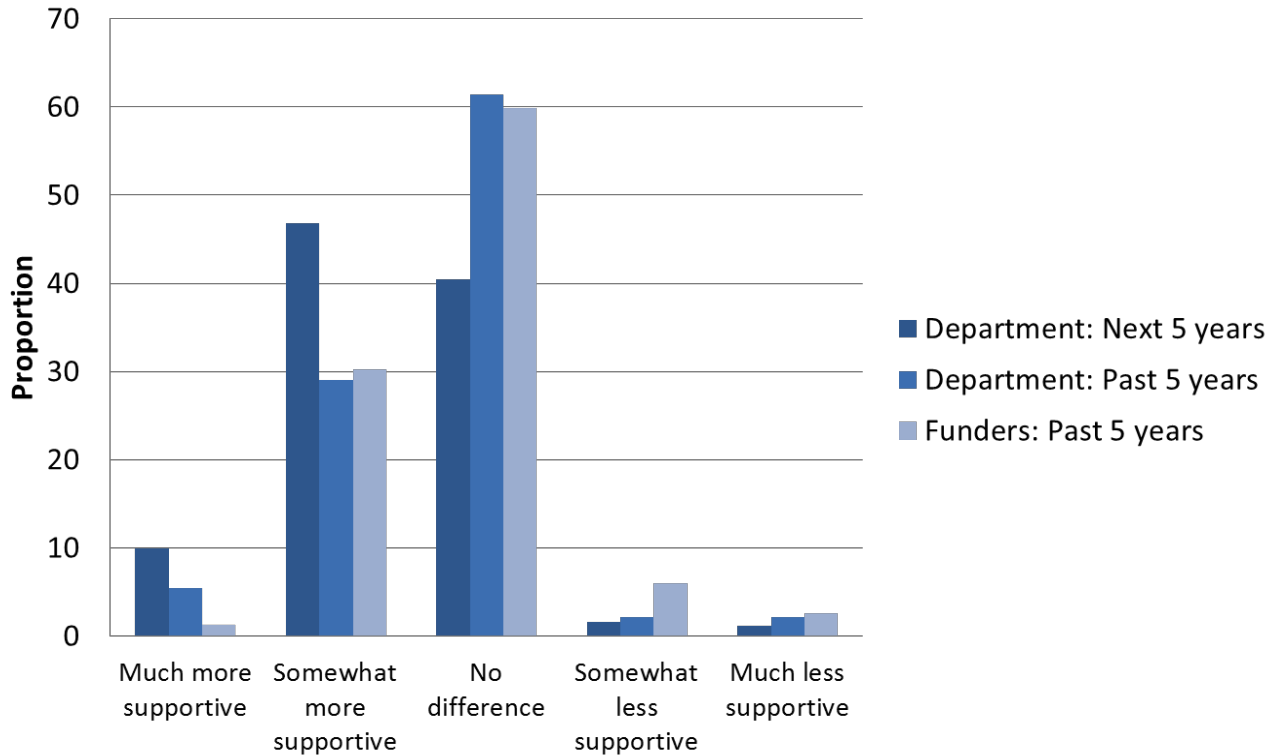


Figure 2. Perceived change in support from department and external funding agencies for evolutionary research.

Participants indicated which types of evolutionary coursework were available in their departments. About one-quarter (23%) of participants were in a department with a PhD program with an explicitly evolutionary focus, and about one-fifth (18%) of participants' departments had a Master's level program with an explicitly evolutionary focus (see Table 4). About a third of participants' departments (36%) had graduate level evolutionary coursework and half (50%) had undergraduate level evolutionary coursework. Note that respondents are those who have substantial interest in evolutionary research, so these proportions are likely biased compared to a systematic census of university departments and programs.

The most commonly available evolutionary-themed event that participants reported as occurring within their departments was individual external guest speakers (45%), followed by individual internal speakers, not for a regular class (29%, see Table 5). About a fifth (22%) of participants' departments had an evolutionary speakers' series that continued from year to year, an additional 10%

had an evolutionary speakers' series at least once. About a fifth (18%) of participants' departments had a Darwin Day event.

Table 3. Proportion of departmental faculty by disposition towards evolutionary research.

Proportion of departmental faculty by disposition towards evolutionary research					
Attitude	M	SD	25%	50%	75%
Active evolutionary researchers	18.50	24.69	2.67	9.09	25.00
Sympathetic to evolutionary research	17.29	17.49	2.83	14.29	26.25
Indifferent to evolutionary research	40.52	35.11	5.00	35.71	66.67
Somewhat hostile to evolutionary research	9.06	13.52	0	4.00	14.90
Very hostile to evolutionary research	4.22	9.82	0	0	4.10

Table 4. Departmental availability of evolutionary coursework.

Does your department have any of the following?	
Response	% Yes
PhD in an explicitly evolutionary program	23
Masters in an explicitly evolutionary program	18
Bachelors in an explicitly evolutionary program	9
Graduate concentration or certificate in evolutionary studies	9
Undergraduate concentration or certificate in evolutionary studies	7
Graduate level evolutionary coursework	36
Undergraduate level evolutionary coursework	50

Table 5. Departmental availability of evolutionary events and activities.

Departmental availability of events with an evolutionary focus	
Response	% Yes
Individual external guest speakers	45
Individual internal speakers, not for a regular class	29
An ongoing speakers' series including external guest speakers	22
A Darwin Day event	18
A speakers' series including external guest speakers that is now complete	10
Some other event with an evolutionary theme	22

Section 4: Perceptions of interest in and understanding of an evolutionary approach to research

Participants felt that nearly three-quarters (72%) of department faculty were at least somewhat interested in the evolutionary perspective (see Figure 3). The majority of participants (60%) felt that department faculty's interest in the evolutionary perspective was unchanged in the past five years; though 38% thought that interest had increased (see Figure 4). Four-fifths (81%) of participants in departments with graduate students (89% of all participants) felt that these students were at least somewhat interested in the evolutionary perspective (see Figure 3). Half of these participants felt that the level of interest had not changed in the past five years, though nearly half (46%) felt that interest had increased (see Figure 4). Similar numbers were obtained for undergraduate students, as almost nine out of ten (87%) participants felt that the undergraduates in their departments were at least somewhat interested in the evolutionary perspective (see Figure 3). Participants believed there was a high level of interest in evolutionary research among the general public, such that 86% thought that the general public was at least somewhat interested, and 49% thought that the general public was moderately or very interested (see Figure 3). Most (67%) of participants believed that the general public's level of interest had increased at least somewhat in the past five years (see Figure 4).

Participants believed that their own departmental faculty were less interested in evolutionary research than faculty in their field from other departments, $t(227) = 6.786$, $p < .001$, $d = .45$, graduate students in their department, $t(214) = 4.71$, $p < .001$, $d = .32$, undergraduate students, $t(227) = 5.23$, $p < .001$, $d = .34$, and the general public, $t(227) = 4.36$, $p < .001$, $d = .28$. Participants also believed that others in their field were more interested in evolutionary research than graduate students in their department, $t(201) = 4.71$, $p = .029$, $d = .16$.

Nearly three-quarters of participants (72%) felt that the understanding of the evolutionary perspective on human psychology and behavior among other faculty members in their department was either 'fair' or 'poor' (see Figure 5). More participants thought that graduate students' understanding of the evolutionary perspective on human psychology and behavior was 'fair' or 'poor' (57%) than 'good' (43%). In contrast to the high level of interest in the evolutionary perspective among department undergraduates, two-thirds (66%) of participants felt that department undergraduates' understanding of the evolutionary perspective on human psychology and behavior was either 'fair' or 'poor'.

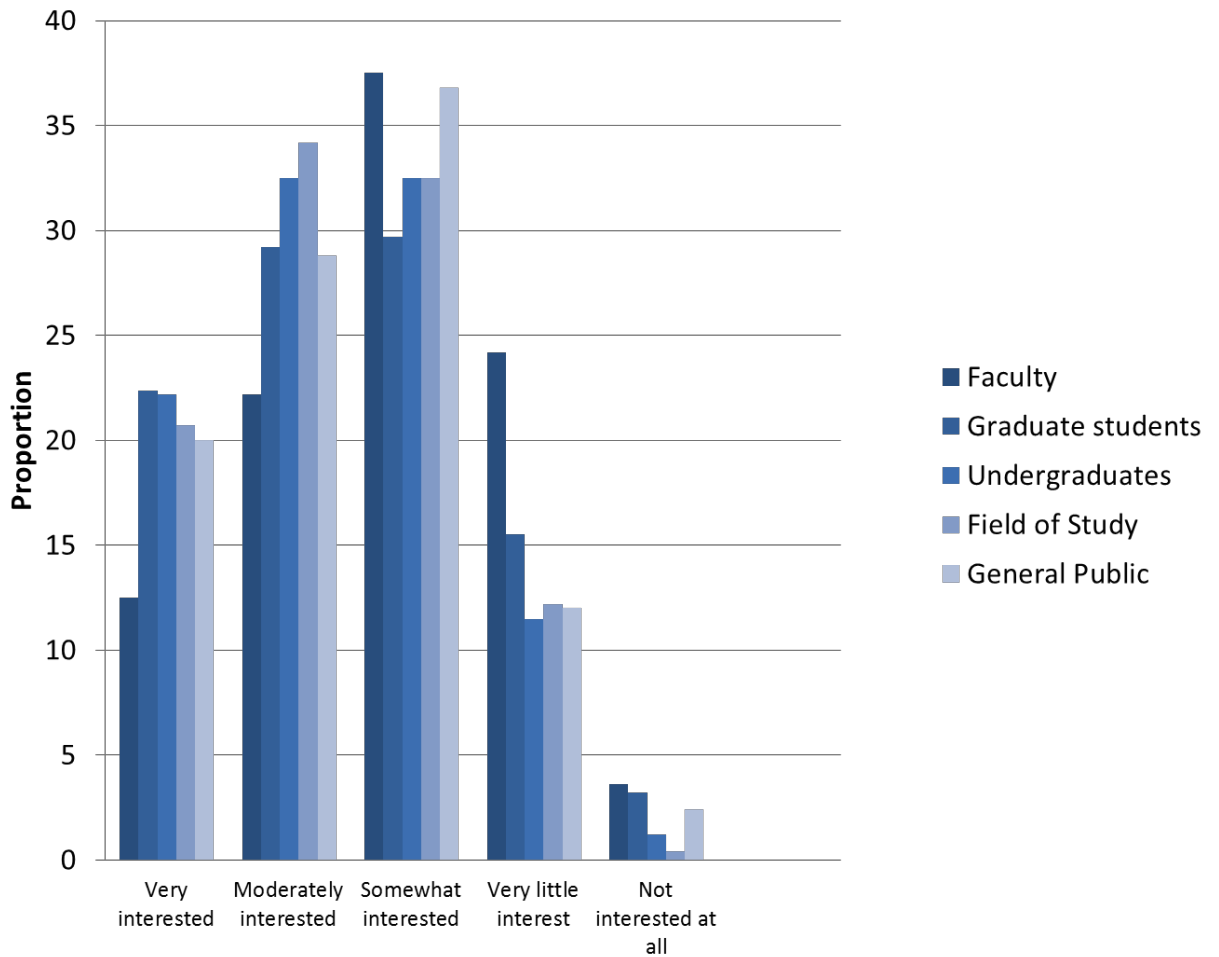


Figure 3. Perceived interest in the evolutionary perspective on human psychology and behavior across groups.

Nearly all (95%) participants believed that the general public's understanding of the evolutionary perspective on human psychology and behavior was either 'fair' or 'poor'. Participants believed that graduate students in their department had a better understanding of evolutionary research than undergraduate students, $t(208) = 4.02, p < .001, d = .28$, and the general public, $t(213) = 13.65, p < .001, d = .93$. Participants also believed that undergraduate students had a better understanding of evolutionary research than the general public, $t(237) = 13.13, p < .001, d = .85$.

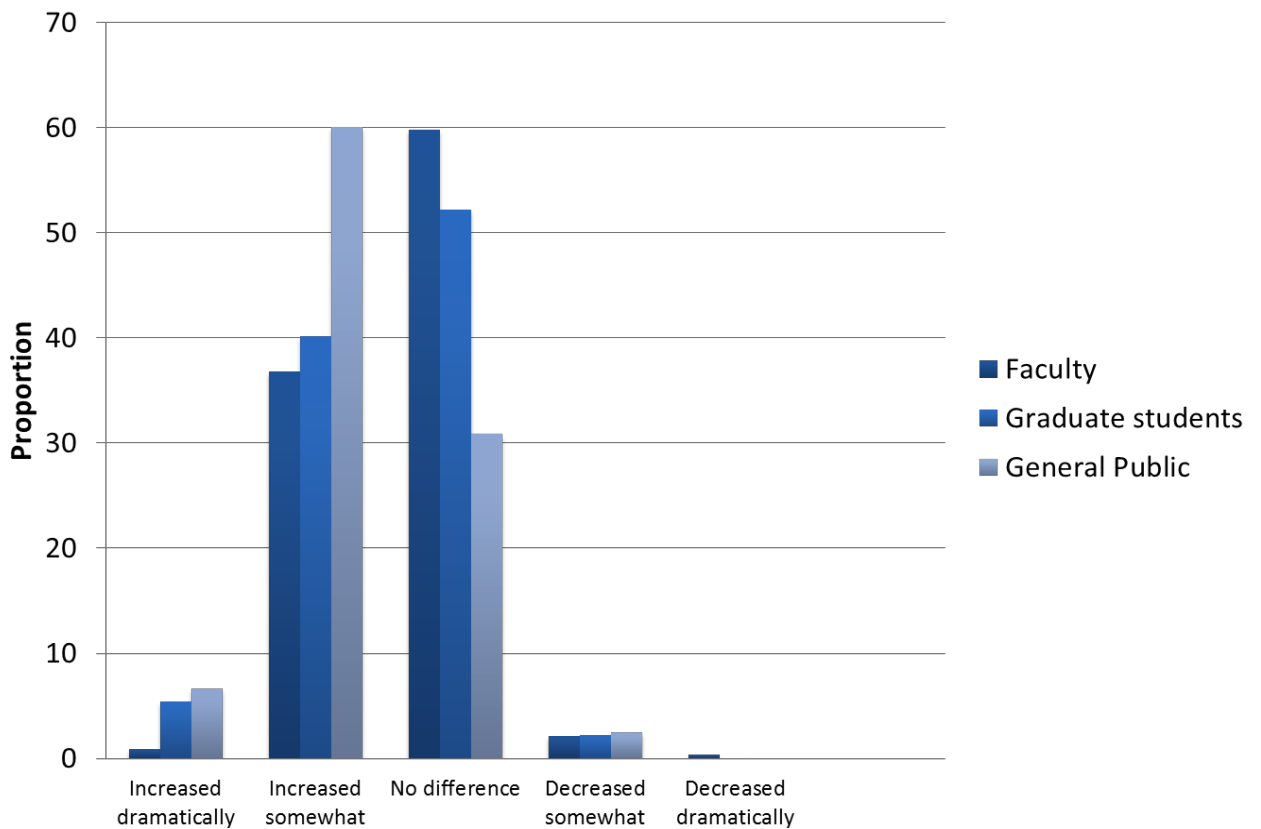


Figure 4. Perceived change in interest in past 5 years across groups in the evolutionary perspective on human psychology and behavior.

Participants believed that there was a high level of interest in evolutionary research among those in their field; 87% thought that those in their field were at least somewhat interested, and 55% thought that those in their field were moderately or very interested. Participants were generally hopeful for greater levels of interest in their field, such that 67% believed that those in their field would be at least somewhat more interested in evolutionary research in five years (see Figure 6). Most participants (67%) believed that evolutionary research was at least somewhat prominent in their field, whereas 44% believed that evolutionary research was moderately or very prominent in their field (see Figure 6). Most participants (78%) believed that evolutionary research was more prominent now than five years ago (see Figure 8). Three-quarters of participants (74%) also believed that evolutionary research would become more prominent in five years than it is now (see Figure 8).

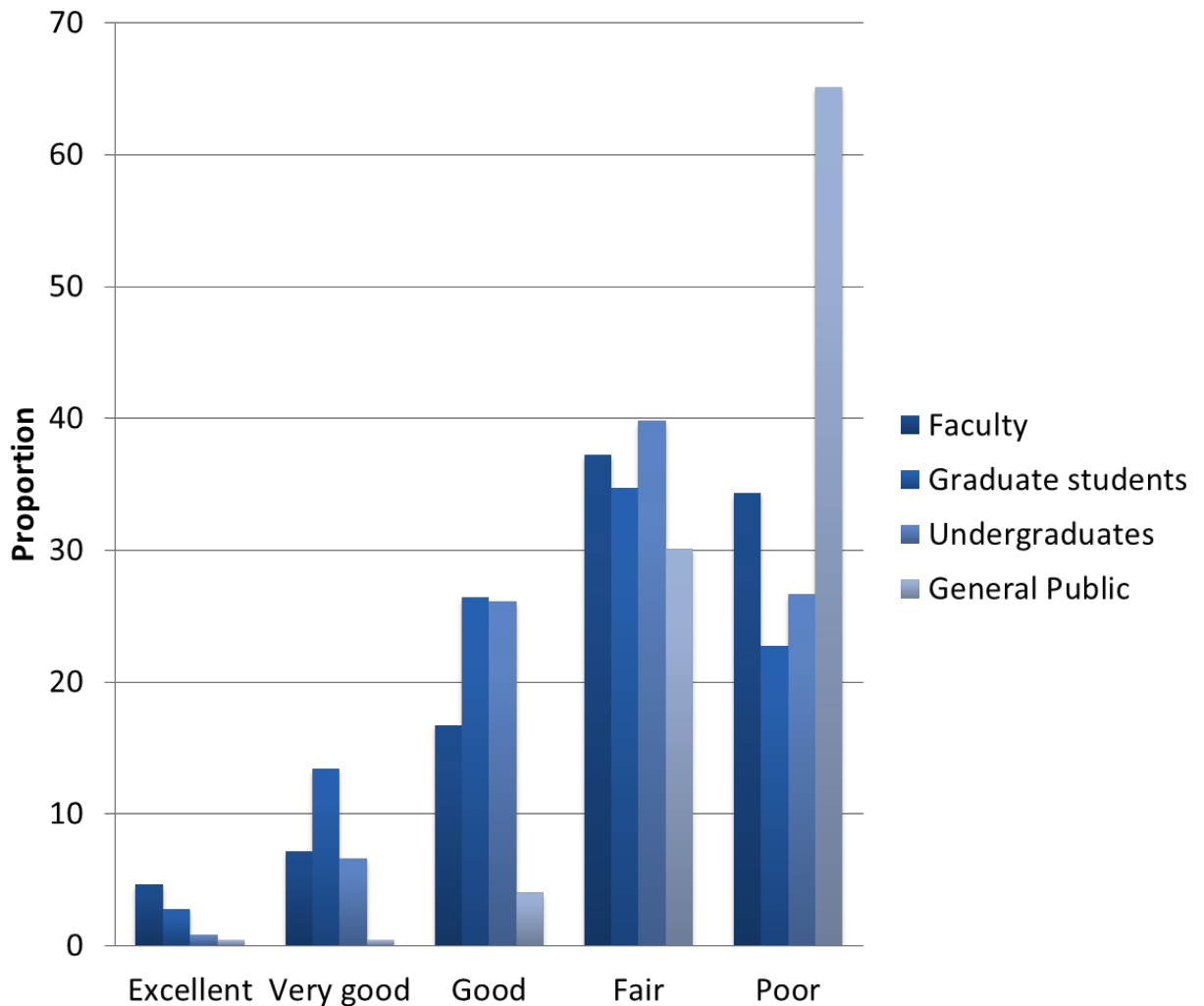


Figure 5. Perceived understanding of the evolutionary perspective on human psychology and behavior across groups

Participants estimated the extent that attitudes in their field towards evolutionary research would change due to: 1) Conversion of those already active in the field; 2) Retirement of those currently active in the field; and 3) Addition of new researchers, responses summed to 100%. Participants gave the highest overall value was given for "Addition of new researchers," ($M = 38.58$, $SD = 25.78$), followed by "Retirement of those currently active in the field," ($M = 27.18$, $SD = 21.51$), and finally "Conversion of those already active in the field," ($M = 16.83$, $SD = 18.75$).

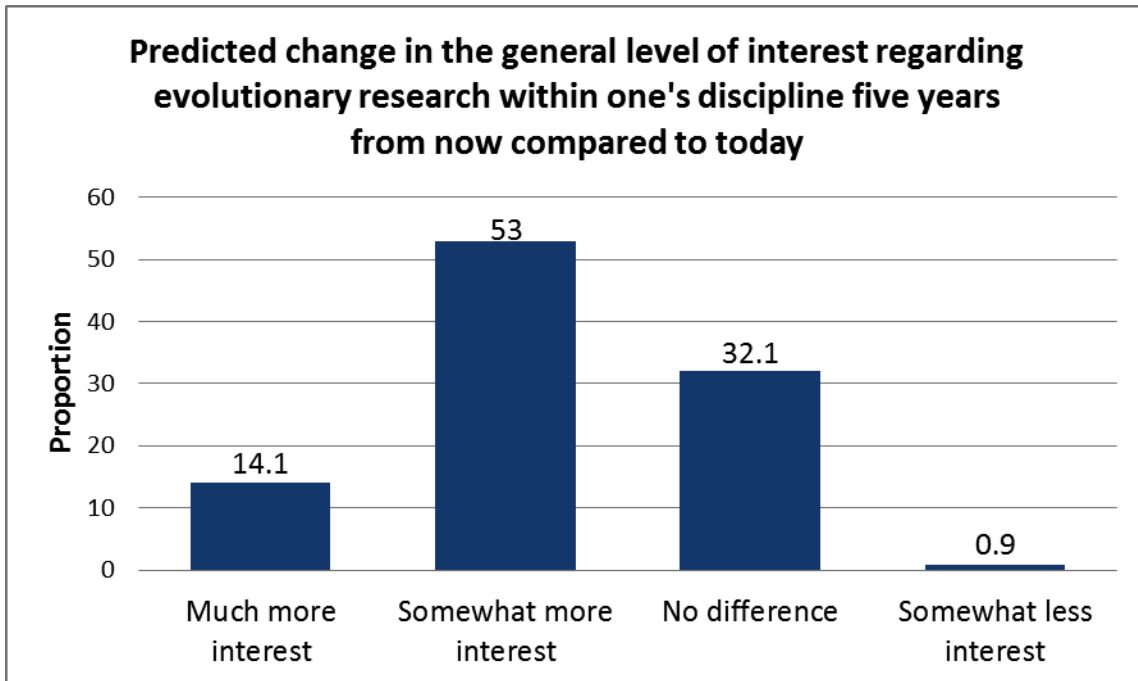


Figure 6. How do you think the general level of interest regarding evolutionary research in your discipline will be five years from now, compared to today?

Participants were able to make comments in an open-ended question on departmental issues. Many participants reside in departments with considerable interdisciplinary, though not evolutionary, research. Some were in evolutionary anthropology departments or programs that explicitly followed an evolutionary approach. Many stated that their departments are split into evolutionary, anti-evolutionary, and/or indifferent camps, especially those in anthropology. Participants remarked that those in different camps within departments have very little direct interaction.

Even though many reported hostility or indifference from departmental colleagues (especially in psychology and anthropology), they also noted that some of the most hostile individuals have retired or are getting close to retirement. Others reported that some of the other faculty in their department feel less strongly about whether one relies on an evolutionary framework and instead appreciate one's productivity regardless of the theoretical perspective that is used. One participant elaborated, "It used to be much more hostile than it is now because some of the most hostile people have retired. Some folks are curious but hesitant. In particular, it is hostility over work on gender and sex differences that has probably provoked most of the hostility - and to be perfectly honest, seeing the low quality of some of the evolutionary work out there, I can't always necessarily blame them. I find that a slow and rational explanation is much more effective at converting them than an in-your-face 'I'm an evolutionist and it's the best perspective' that I've seen others do. Oh, and it helps to acknowledge that there is some bad evolutionary work, just as there is some bad work in any field."

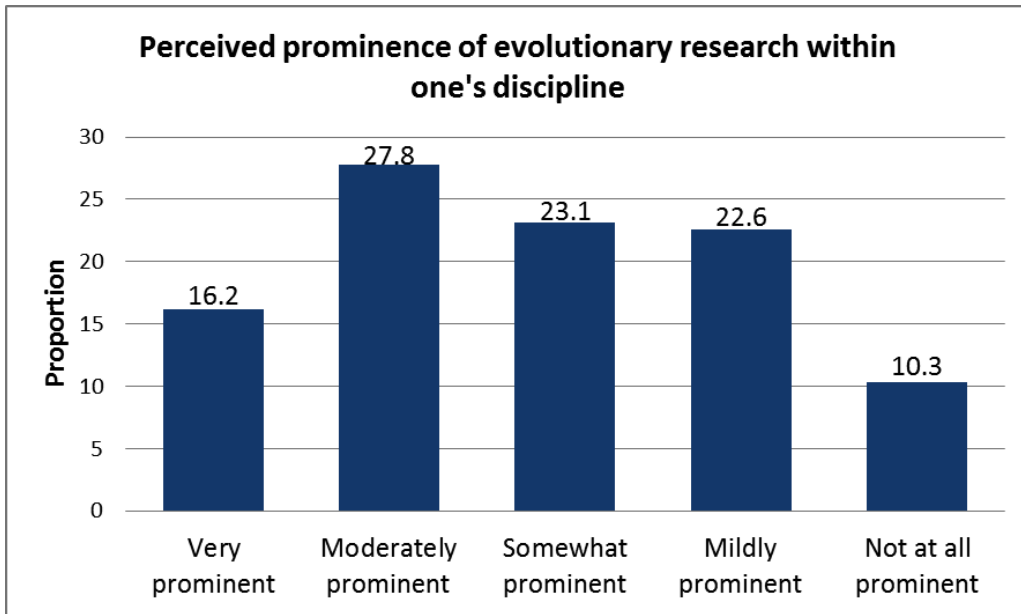


Figure 7. How prominent do you think evolutionary research is in your discipline today?

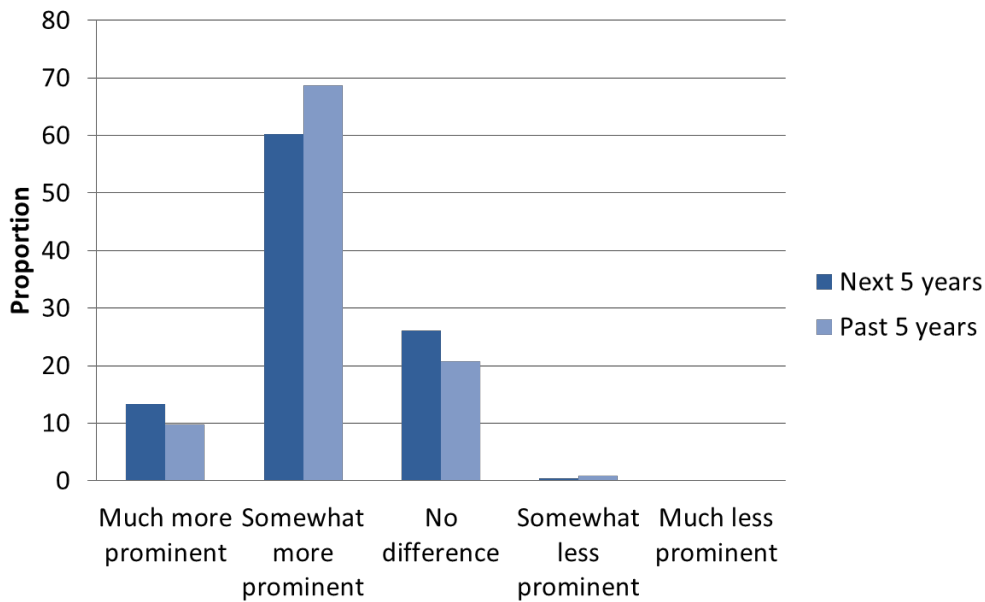


Figure 8. Perceived and expected change in prominence of evolutionary research.

Participants also noted that there still is a real lack of understanding of the perspective on the part of their colleagues. One noted that, “The lack of understanding of evolutionary theory is disturbing. I sometimes hear things I would

expect people without higher education to say,” another commented that, “They're supportive but generally unaware of even fundamental ideas, such as kin selection.” Some remarked that it is tough to be the only evolutionary minded person in a department, for example, “I am singularly responsible for all [evolutionary events and activities] checked above.” Some individuals reported that conditions were much better in a department with one or two big name people in the field. Interestingly, a couple of individuals from very small departments reported a high degree of unity regardless of perspective, perhaps due to requiring a united front to obtain limited resources for the department as a whole.

Section 4: Conferences

The majority (77%) of participants attend an evolutionary themed conference at least once a year (see Figure 9). The majority (59%) of participants considered evolutionary themed conferences to be more collegial than other conferences they attend (see Figure 10). Most participants felt that (72%) there was no difference in the collegiality of evolutionary themed conferences since they began attending them (see Figure 11). Similar proportions thought that evolutionary themed conferences were becoming more (16%) and less (13%) collegial. About two-thirds (65%) of participants identified themselves as conducting research based on evolutionary theory moderately or very strongly when at non-evolutionary themed conferences (see Figure 12).

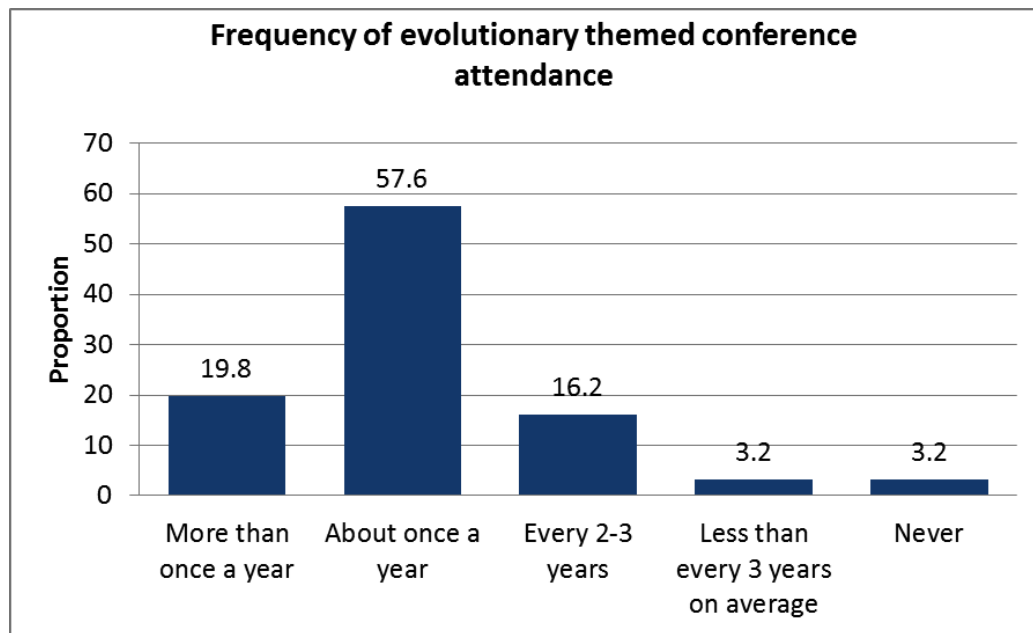


Figure 9. How frequently do you attend evolutionary themed conferences?

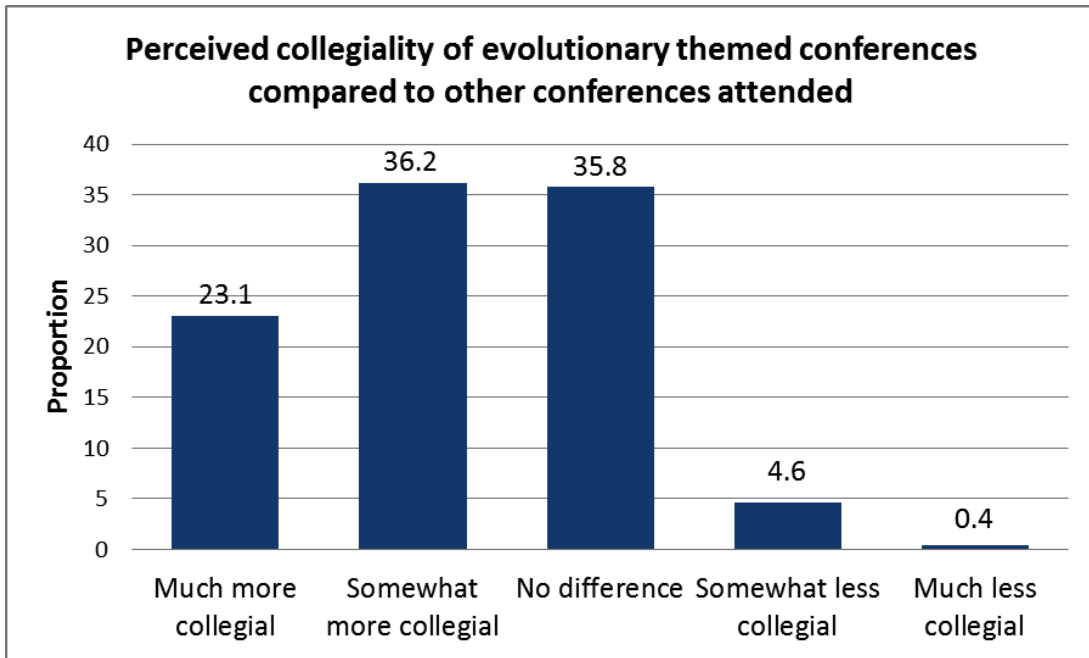


Figure 10. How collegial are evolutionary themed conferences compared to other conferences that you attend?

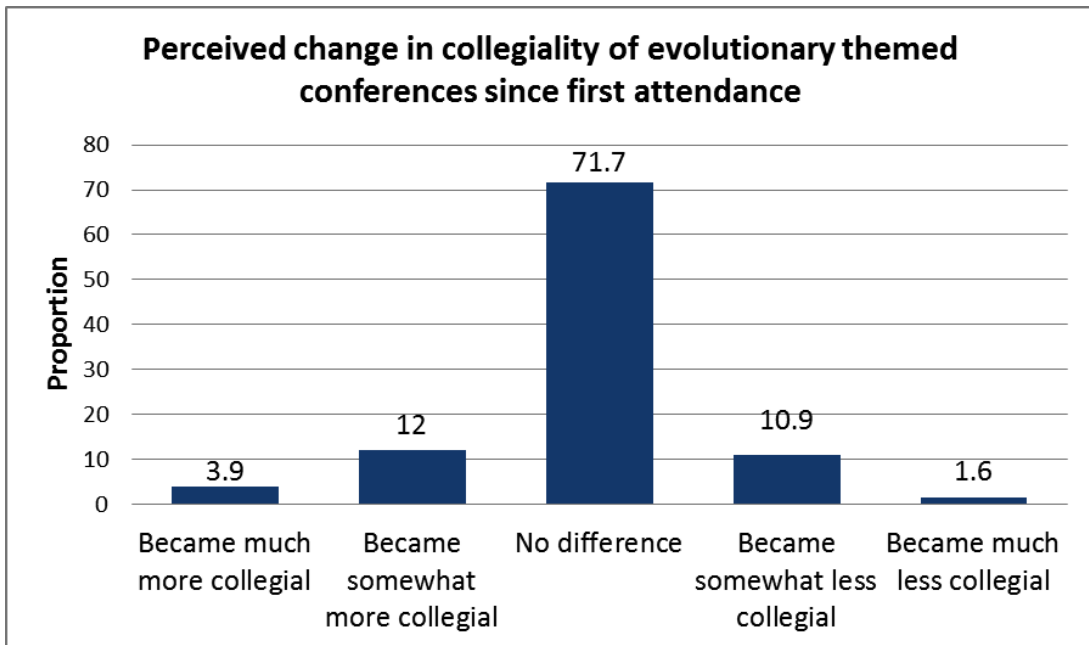


Figure 11. How have evolutionary themed conferences changed in collegiality since you began attending them?

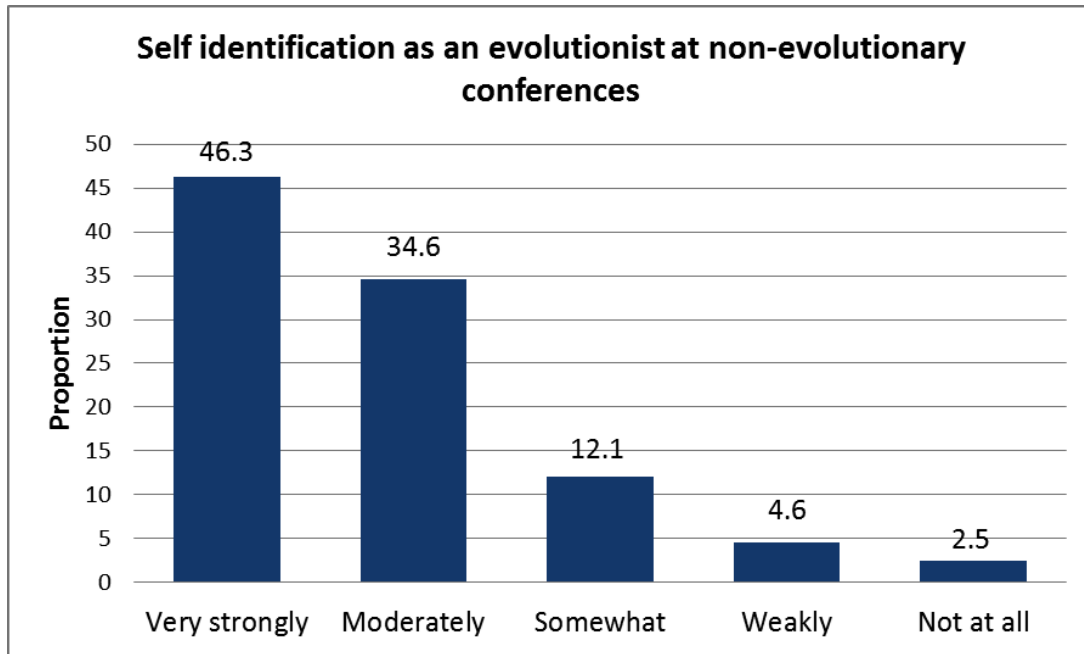


Figure 12. When you are at non-evolutionary themed conferences, how strongly do you identify yourself as an evolutionist?

Participants were asked to provide open-ended comments about the conferences they have attended. The majority of respondents appreciate evolution-based conferences for several reasons including intellectual exchange, establishing new collaborations, networking opportunities, collegiality, and a chance to socialize. Respondents commented that they are a “Good venue for intellectual exchange and establishing new collaborations,” and “Evolution-based conferences are by far my favorite to attend. The atmosphere always facilitates networking and socializing along with the interesting talks.” Participants remarked that because of the common evolutionary framework, diversity in presentations was an asset, compared to general conferences where discrepant approaches are a barrier. Participants also reported that it was more difficult to be taken seriously at larger and more general conferences and that they spent too much time defending the perspective rather than focusing on their specific work. Several participants stated they found non-evolutionary conferences increasingly boring or irrelevant. Many respondents mentioned liking the small size of HBES, ISHE, and NEEPS annual meetings as they found them more collegial than larger conferences. One remarked, “Usually evolution-themed sessions at non-ev conferences are not great, and they seem to often be preaching to the choir a bit. But of course I think they are necessary. It’s just sad that some research areas that should be based on evolutionary reasoning are filled with scholars that do not recognize it.”

On the other hand, several others mentioned that they found HBES to be cliquish and felt marginalized, as they were not part of a “big name” research group.

Some participants stated that attendees from specific schools tend to be particularly cliquish. A few individuals noted that attendees at evolutionary-themed conferences seem to take them less seriously than other conferences, one noting that the poster sessions at the HBES meetings and the Society for Personality and Social Psychology Evolutionary Psychology Preconference "were set up embarrassingly poorly." One bemoaned the prevalence of "adaptationist thinking" compared to other important aspects of evolutionary theory, and advocated more research from a comparative approach. Some respondents noted that as the popularity of evolutionary approaches increases, the importance of maintaining rigor also increases; "With its growing popularity, evolutionary psychology has produced more and more people eager to test their "evolutionary" idea without solid backgrounds in evolutionary theory. It will be to the benefit of HBES to maintain rigor in its members and conference presenters."

Section 5: Career issues for evolutionary researchers

The majority (63%) of participants felt that someone emphasizing an evolutionary perspective in their research would have more difficulty obtaining a job in their field, compared to someone with roughly the same credentials who does not use an evolutionary perspective (see Figure 13). Half (50%) of the participants felt that job prospects were no different for those conducting research based on evolutionary theory compared to five years ago, though more thought that conditions have improved (44%) than deteriorated (7%, see Figure 13). The majority (57%) of participants did not believe that job prospects for evolutionists would improve in five years, though more thought that conditions would improve (43%) than deteriorate (13%, see Figure 13). Most (65%) participants identified themselves moderately or very strongly as an evolutionist when applying for their current position (see Figure 14). The majority (58%) of participants would identify themselves moderately or very strongly as an evolutionist were they to go on the job market in the next year (see Figure 14). However, fewer participants would identify themselves very strongly as an evolutionist in a new job search (26%) than when applying for their current position (40%). A larger proportion of participants (53%) thought that being an evolutionist had benefitted their career standing rather than hindered it (26%, see Figure 15).

In open-ended responses, respondents remarked on several themes related to career issues. One prominent theme was the duality, in terms of the advantages and disadvantages, of using an evolutionary perspective. Relying on evolutionary theory can be intellectually rewarding and enhance productivity, but it can be costly in terms of the hostility it triggers from others. For example, a respondent wrote, "Its helped my research, but there are still negative biases against evolutionary applications of human behavioral research." Another researcher wrote, "Within anthropology, applying evolution to human behavior is still taboo in too many institutions." Another elaborated, "The primary difficulty is that there are fewer evolutionary positions in anthropology than non-evolutionary ones. In some regards, an individual with an evolutionary background is at an advantage, however, because typically s/he is also well-trained in traditional anthropology and thus may be able to compete for a more traditional cultural or biological anthropology position, whereas

someone with a non-evolutionary perspective will be unable to compete for an evolutionary position."

Many students reported using two versions of their application or Curriculum Vitae (CV), such that one is explicitly evolutionary, while the other one has the evolutionary focus removed or muted. One student stated, "All EP graduate students applying for jobs generally have at least 2 versions of their resume, with one version having been scrubbed clean." A faculty participant revealed, "Two days ago I was informed, in confidence, that a student of mine was not considered for a position at a major research university because of his evolutionary taint. I think this is very common. I suspect that many people in this field get jobs in spite of, not because of, our evolutionary work. That is certainly true for me." One person remarked, "I am trying to find a job. I do not say that I'm an evolutionary psychologist. I say that I am a biological psychologist." Some faculty were wary of advertising their evolutionary perspective too strongly before being tenured, and others noted that one anti-evolutionist on a search committee can result in blacklisting. Some individuals noted the influence of their location; for example, hostility in the American Bible Belt or the general acceptance of human evolution in Sweden. One participant benefitted from subtlety; "I recently was given a tenure track offer. In my application I mentioned that I used the evolutionary approach, and it helped my application somewhat. However, the position was not open to those who were 100% evolutionary psychologists."

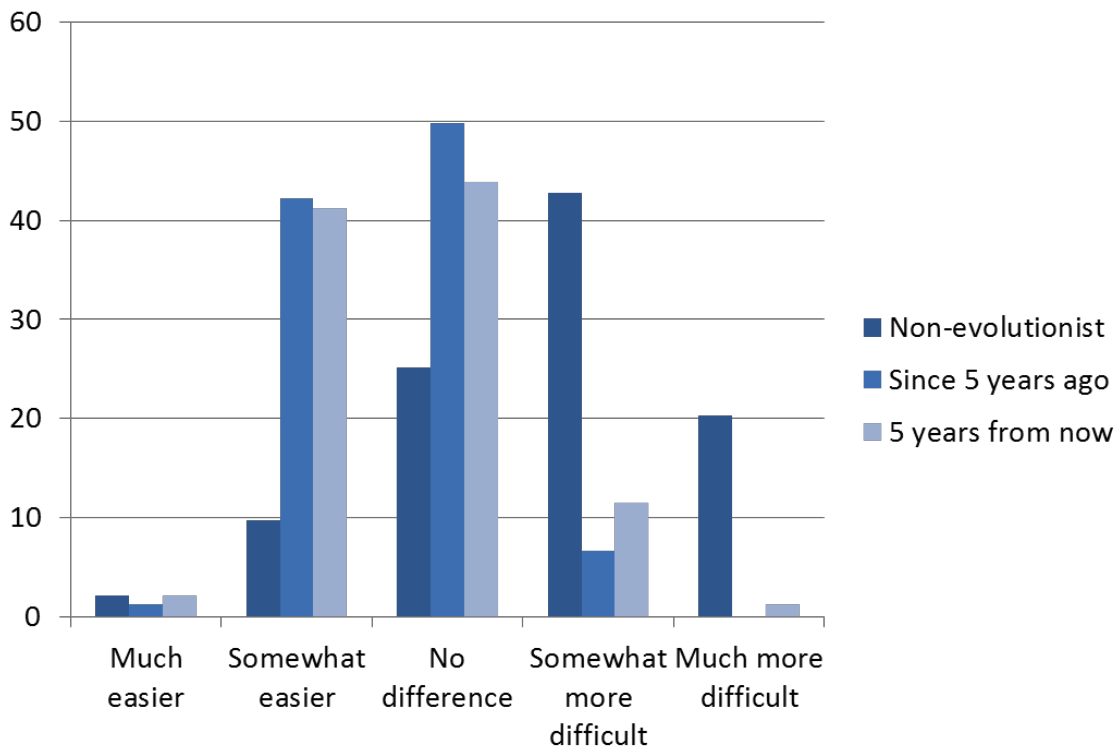


Figure 13. Perceived relative ease of getting a job in one's field.

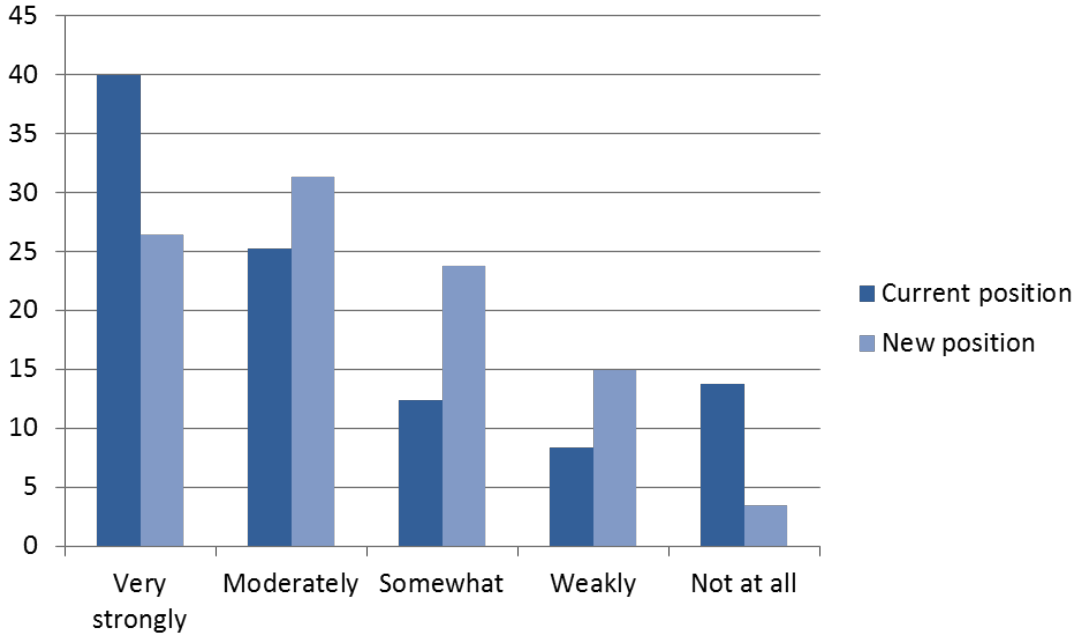


Figure 14. Strength of identification as an evolutionist in job applications.

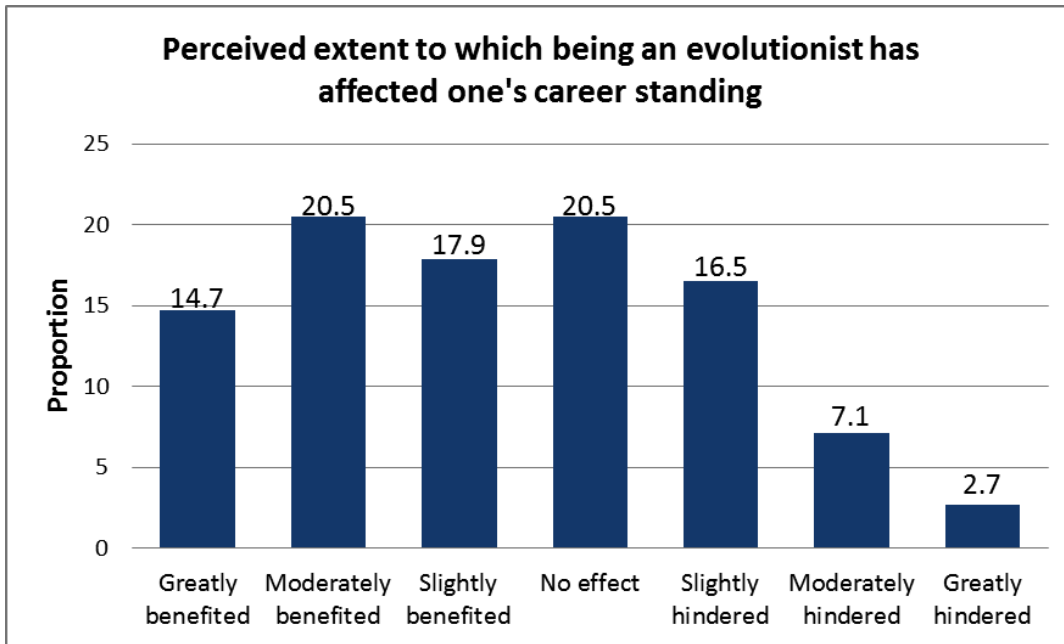


Figure 15. How do you think being an evolutionist has affected your career standing?

There was also general concern about the current state of the economy and its detrimental effects on faculty positions available, as well as a perception that remaining position openings were recruiting for traditional areas associated with the larger undergraduate courses. Some participants recommended building a secondary strength such as statistics as a way to improve one's value on the job market. However, a few others noted that the demand for evolutionary psychology courses stemming from student interest is on the rise, and evolutionary studies programs are emerging throughout the country, so consequently, departments may respond by hiring at least a token evolutionist.

Section 6: Perceptions of challenges and trajectories for evolutionary approaches

There were a wide range of answers regarding major current challenges for evolutionary researchers, including maintaining theoretical rigor, avoiding narrowness, education about basic principles, marketing and dissemination to the public, and ideological hostility. Here are two representative responses: "The biggest hurdle is the lack of knowledge about evolution. And not only the lack of correct knowledge, but the preponderance of misinformation," and "Evolution is an idea that everybody thinks they understand, but very few really do. I think a big challenge is to get non-evolutionary scholars to really understand the claims that evolutionary social scientists actually make. This kind of basic education can help evolutionary researchers get grants, jobs, and papers published. I believe some of the misunderstandings are willful and politically motivated, but a lot of times it has to do with missing the subtleties of a very complicated idea cloaked by simplifying assumptions."

One respondent suggested that the biggest challenge is, "Hostility driven by a postmodern, interpretive, highly politicized, phenomenological orientation in the humanities which is taking over the social sciences." Another remarked, "Stupid religious people [are the greatest challenge]. Humanity is still at a state where we might as well be sacrificing goats." One cited, "Ignorance on the part of our peers, especially the recycling of criticisms to the sociobiological ideas of the 1970s" as a challenge. Someone else cautioned about, "Ignorance of evolutionary theory caused primarily by the naturalistic/moralistic fallacies but disguised as a genuine interest in methodological rigor." A few noted how misunderstandings could result from problematic aspects of the media sound-bites covering evolutionary research; "I think that the dissemination of evolutionary research to the public (e.g., attractiveness studies) are presented in an extremely reductionist manner and this can create gross misunderstandings. These misunderstandings can be particularly damaging if this is the only insight some people have into evolutionary research (e.g., by way of funding opportunities)."

Others also noted the challenges of growing public interest, for example, "evolutionary research is very popular, but public comprehension is still pretty low, making misinterpretation and thus backlash a relatively big problem," and "Surviving the bad reputation brought upon EP by the media (and I don't mean the negative attitude towards EP that can sometimes be observed in the press; quite the contrary, the EP-friendly media with their superficial knowledge that presents EP as

a cheap “know-it-all” almanac, which is certainly more damaging than being publicly attacked by some angry clergyman or a hard core feminist...) and by some irresponsible researchers within the field itself.”

Participants noted the phenomenon of circling the wagons against hostile forces and its consequences. For example, one respondent wrote, “EP folks have been forced to adopt a defensive position because of the opposition the field faces. This has been both bane and a boon...It has forged strong bonds within the community of researchers along with developing the tendency to write off criticism too easily when it comes from a party outside the field. There is some truly terrible research within our field, just like in any other field and it should not be supported so willingly just because it is EP work.” There was also a concern with public perception of the field and the misunderstanding of research results that can occur. Several individuals suggested that more attention needs to be focused on getting people (lay people and other academics) to really understand evolutionary theory.

Some participants cautioned against the dangers of presenting oneself as part of a sect that has seen the light or promoting work in a flashy way that can easily be misinterpreted. Others expressed concern with avoiding political implications and avoiding getting dragged into such issues. There were also concerns raised about conflicts between political and religious beliefs and science in general.

Not all participants, especially many of the student respondents, felt qualified to answer the question about how the field has changed over the past five years. Of those that did respond, some of the changes were seen as positive, including greater methodological rigor, researchers being much more critical of themselves and others in their findings, using more tools such as hormone assays, greater focus on individual differences, dealing with broader topics including culture, the increase in academic programs and field specific journals. Respondents also noted the increase in public attention and popular press books, as well as greater representation in top tier journals.

One participant remarked, “The field has grown and become more interdisciplinary in the past five years. Findings have gone more mainstream.” Others suggested that there was too much emphasis on mating and that although there is better research being done, there is also poorer research performed, more weak co-opting of “evolutionary” explanations (i.e., vague appeals to survival benefits), and more “pop” evolutionists with questionable books and credentials. One respondent noted that scientists are under greater pressure to publish, which could cause a reduction in the quality of articles. Others thought that there has been little change, which they did not find surprising in a five-year window, and commented on how paradigm shifts in science tend to be rather slow.

Respondents identified several important aspects in how they hoped that the state of evolutionary approaches would change over the next five years; many of these were reoccurring themes. One of the most prominent themes was the need for increased methodological rigor and attention to quality. One respondent suggested a more formal system of education, such as standardized curricula and core standards of knowledge. Respondents would like to see more direct tests of competing evolutionary hypotheses as well as tests with hypotheses from researchers not following an evolutionary approach. Of course, some also wanted to

see, "More recognition for my ideas." Some psychologists also hoped, "to see evolutionary psychology become a typical area in psychology departments alongside the standard areas of social, industrial/organizational, clinical, cognitive, and developmental psychology."

Many respondents proposed that greater integration of diverse research methodologies, types of data, and disciplines would enhance the quality of the field. Interdisciplinary collaborations could help promote acceptance of evolutionary approaches, marshal evidence on the full scope from proximate mechanisms through ultimate explanations, and combine areas of expertise that are difficult to simultaneously cover in the training of any one individual. Moreover, the integration of evolutionary approaches such as evolutionary psychology, evolutionary anthropology, behavioral ecology, biology, ethology, behavior genetics, neuroscience, and dual-inheritance approaches could lead to stronger research. Respondents recommended complementing survey methods with observational (ethological) methods and integrating multiple levels and types of data. Quite a few respondents focused on the need for evolutionarily friendly jobs and grant funding.

It is notable that some respondents to a survey for evolutionary scholars stated the need for less "hand-waving" and "just-so stories." As one respondent remarked, "Other areas of psychology treat evolution as a 'garbage' area that runs a correlation between two variables and calls it an 'adaptation.' That kind of research in evolutionary psychology needs to stop." Several respondents commented that there is too much research on mating and sex differences (especially generalizing findings from undergraduates in wealthy nations) and that they would like to see more studies in areas such as vision, hearing, and judgment and decision-making. Research in more general or mainstream areas would persuade other psychological and behavioral researchers that evolutionary theory is deeply helpful for explaining their own areas of expertise. Some explicitly advised against courting controversy or getting into political issues. One noted that getting exposure is part of the game, and sexy research gets people noticed, though s/he considered this unfortunate and detrimental to the science.

Many respondents remarked that they would like to see life-history theory become a unifying framework. Some participants proposed gene-culture co-evolution would be a useful governing theme, while others focused on the necessity for more dialogue between the sciences and humanities. Several respondents wished to see more applications of evolutionary theory and findings to practical applied issues, especially those aimed at improving the human condition.

There were diverging opinions on whether the evolutionary approach should be a separately recognized and respected field or whether fields such as evolutionary psychology and evolutionary anthropology should disappear, as all studies of behavior should consider evolutionary theory.

Some individuals would like to see evolutionary psychology become a typical area in psychology departments alongside the standard areas of social, industrial-organizational, clinical, cognitive, and developmental psychology. Others would require the teaching of evolution for all majors and graduate students in psychological and behavioral research.

Many participants remarked on the importance of incorporating evolution in the curricula at all levels of education. For example, one person wrote, "Evolution

should be taught PROPERLY in public schools so that the public and new students are better prepared to understand the research.” They bemoaned the fact that many researchers had to engage in fruitless debates about fundamentals and defend the theory of evolution before discussing their actual research. Providing comprehensive and systematic basic education on evolution may promote greater acceptance from colleagues and help prepare the public and new students to understand the research. Several respondents hoped for more designated job openings and external funding. Several would like to see more series of talks by luminaries in the field, the expansion of programs such as the Evolutionary Studies Consortium (EvoS), and more regional conferences like NEEPS.

Respondents were generally modest in their expectations for changes for the field in the next five years. Most were optimistic that the field would progress in the directions described above, but that change would be slow and incremental. Some did not think that five years was enough to notice substantial change. One remarked, “I expect not much change until more of the ‘old’ thinkers retire.” The current lack of funding and adverse economic climates were mentioned as inhibiting factors. Others noted that a few institutional structures were creating enhanced opportunities, such as Arizona State's new School of Human Evolution and Social Change, Harvard's new Department of Human Evolutionary Biology, and Duke's recently renamed Department of Evolutionary Anthropology. Several participants mentioned that the most hostile critics of the evolutionary approach would be retiring and replaced with scholars who would be potentially more accepting. Another noted that evolutionary researchers were becoming more media savvy and thus the approach was benefitting from better public relations. One participant mentioned that the growing attention to individual differences might also attract new people to the field.

DISCUSSION

Our survey represents an attempt to assess scholars' perceptions of fields that rely upon evolutionary theory to explain human behavior. We surveyed members of three conference communities, as well as scholars who we located via departmental websites. Our respondents included a wide range of new and seasoned scholars; we received replies from graduate students, new faculty, and those who have recently retired. In general, the respondents perceive there to be positive change in terms of the acceptance of those using an evolutionary view, but outline many challenges that scholars still face.

Overall, participants were optimistic for increased interest and support for evolutionary approaches over time, though some cautioned that disciplinary change would occur “one PhD defense and one retirement at a time.” The rate of change may not be quite that slow, as new researchers are initiating research from an evolutionary perspective earlier in their careers compared to more established researchers. We also believe that the fact that participants had an average of three collaborators at their current institution was an indicator of the increasing presence of the perspective within department. Some smaller schools have more than one person who is relying on an evolutionary framework, which makes for a supportive environment for junior faculty.

Participants also remarked on increased mass media interest, and that members of the general public seem keen to learn about evolutionary-informed research. However, this interest is a double-edged sword, as it might lead to more students requesting evolutionary research in their courses or training, but that increased instruction does not necessarily imply quality, or accurate dissemination of information. Respondents noted concerns with poor public understanding and gaps between interest and understanding among those attracted to the perspective. Although many participants had institutions with undergraduate evolutionary psychology courses (or courses about human behavior that strongly incorporate an evolutionary view), we hope that more universities and colleges will provide better instruction in the basics of evolutionary theory. There is also much room for improvement in this area in elementary and high school education, at least in the United States, which would help with the public understanding.

We concur with the perceived importance of the mass media as a mechanism for evolutionary education (and mis-education). Mass media has always been a more prominent source of science information for the general public than academic journals or lectures, and modern on-line forms of media create new potential outlets for dissemination and interaction. Precisely because of the evolutionary focus on essential features of human nature as well as individual variation, results that are relevant to our social lives catch the attention of the media whether for talk shows or documentaries. Given that mass media can easily misinform, or provide overly reductionist accounts of findings, we provide specific tips on how to best interact with various forms of media in our previous paper (Fisher, Kruger, & Garcia, 2011).

The information we have presented in the current paper represents the experiences of evolutionists, but is not a systematic census on the properties of departments. Other methods would be more suitable for some types of research questions, such as a count of the number of evolutionary PhD programs in human research. We are hoping that the results of this survey prove to be useful to current and future scholars and students of the evolutionary approach to human research, as well as those outside the approach, such as historians of science, who study the progress of scientific fields.

We assessed the beliefs of evolutionary researchers regarding how others perceive human evolutionary research. This project complements the quantification of journal articles and citations (e.g., Peterson & Kruger, 2009; Webster, 2007a, 2007b, 2007c), journal commentary issues featuring the perspectives of specific researchers, and articles detailing the experiences and trajectories of individual researchers (e.g., Fisher, Goetz, Hill, Kruger, Michalski, Osipowicz, Platek, & Salmon, 2009; Fisher, Kruger, Platek, & Salmon, 2004). It is also useful to examine the perspectives of other researchers through surveys. This type of project can build on previous qualitative and ideographic papers that detail individual experiences in an attempt to quantify aggregate trends. Glass, Wilson, and Geher (2012) surveyed 27 authors of evolution-themed articles in Behavioral and Brain Sciences with seven questions to assess the state of evolutionary training at their previous and current institutions. Most of these authors revealed that their graduate training had scarce content on evolution, especially as it relates to human behavior, and that much of their own self-education occurred after completing their PhDs. They also generally

reported that it would be difficult for faculty and students at their current institutions to receive evolutionary training.

Other research has assessed factors related to evolutionary understanding (e.g., Garvey, 2008; Geher & Gambacorta, 2010). Garvey (2008) found that frequency of church attendance, strength of belief in God, high need for cognitive closure, and aversion to unpleasant and/or potentially threatening environmental stimuli predicted tendencies to endorse a Biblical explanation for the origins of the universe and biological life rather than an evolutionary explanation. Geher and Gambacorta (2010) surveyed academics and non-academics on their beliefs regarding the relative influences of “nature” and “nurture.” They found that those who were politically more liberal considered “nurture” more influential than those who were more conservative, especially for human sex-differences. Academics, especially those in sociology or women’s studies, also considered “nurture” more influential than non-academics. Parents, who had experience raising offspring, were more likely to attribute human sex-differences to “nature.” Academics were also more likely to see behavioral differences between roosters and hens as caused by “nurture,” however there were no differences by individual characteristics on attributions for cross-species differences for cats and dogs.

Future research may assess perceptions of human evolutionary research among a general sample of academic researchers, not just those specifically selected for their evolutionary background. These studies would help determine the accuracy of in-group perceptions and build on the patterns documented by existing projects. Such efforts may coincide with replications of this study, which would provide comparisons between evolutionists and non-evolutionary researchers, as well as determine changes in beliefs and perceptions over time. Studies of attitudes and perceptions of scholars are useful because they document the development of a field, and enable us to examine how specific issues arise that hinder, or encourage, students and faculty in specific research areas. Given that our sample is predominantly North American, results of similar surveys may be different in Europe or other emerging areas such as Japan and Brazil. Overall, we are pleased to help foster the continuing maturation of our field.

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