



Putting the theory before the data: is “massive modularity” a necessary foundation of evolutionary psychology?

Ian D. Stephen*

Department of Psychology and Evolutionary Psychology Research Group, Macquarie University, Sydney, NSW, Australia
*Correspondence: ian.stephen@mq.edu.au

Edited by:

Danielle Sulikowski, Charles Sturt University, Australia

Reviewed by:

Thomas Pollet, VU University Amsterdam, Netherlands

Keywords: massive modularity, evolutionary psychology, EEA, Santa Barbara school, human ethology

In this volume, Burke (2014) makes a number of arguments for why evolutionary approaches have failed to penetrate the rest of the field of psychology (what Burke refers to as “mainstream” psychology). While all of his arguments have merit, I will focus on one that I consider to be particularly important—the characterization by critics of the “Santa Barbara school” (Laland and Brown, 2011) as representative of all evolutionary approaches to psychology. Here, I agree with this point, and I expand upon Burke’s point to argue that the focus on massive modularity as one of the foundational principles of evolutionary psychology is “putting the theory before the data,” and opens the discipline to criticism that is unwarranted for many of its researchers.

In 2013, I was fortunate to attend a talk by John Richer at the International Society for Human Ethology’s Summer Institute, who argued that there is much to be gained from applying the ethological methodology of observation and documentation to clinical psychology settings. He was advocating deviating from hypothesis and experimentation, and applying a technique more akin to the production of ethnographies in social anthropology (Richer, 2014). While initially resistant to the idea, I later read Rozin’s (2001) critique of the state of social psychological research. A comparison is made to Darwin’s theory of evolution by natural selection which, he argues, was the result of a large body of observation, description and documentation that took place before the formalization of foundational principles. It grew out of an empiricist—as opposed to theorist—desire to understand

the origins of species. Rozin argues that social psychology, in its rush to model itself on more established lines of research, such as biology and cognitive science, has skipped these important stages of observation and description, which he considers so critical to the development of a young discipline. In so doing, Rozin argues, social psychologists have rushed to formalize as theoretical underpinnings of the discipline ideas that have little supporting evidence, and have greatly restricted the range of acceptable topics for investigation within the field.

The situation in evolutionary psychology is similar, though not identical. Early in its conception, researchers attempted to formalize the field with a set of foundational principles—typically evolved psychological mechanisms, massive modularity of mind/domain specificity and the concept of an environment of evolutionary adaptedness, often assumed to be the Pleistocene (Cosmides and Tooby, 1987). These principles are not universally accepted within the community of researchers who take an evolutionary approach to psychology (Laland and Brown, 2011), and Burke (2014) argues that the massively modular view of the brain is not necessary for the application of evolutionary theory to psychology. Indeed, most research in the field is focused on gathering observations and testing hypotheses derived from fundamental evolutionary principles, rather than from the Santa Barbara school’s formulation (Burke, 2014).

In most discussions about modularity and plasticity in the mind, the argument is really over the degree of modularity

in the mind, and therefore the level on which selection operates. In much of the research being conducted in the field of evolutionary approaches to psychology, this distinction is, however, largely irrelevant. In contrast to the criticisms of many critics of evolutionary approaches to behavior (Benton, 2000), even adherents to the Santa Barbara school’s formulation predict the evolution of flexible mental modules in order to allow flexibility of behavior in response to environmental and internal factors (Kurzman, 2002; see also Sperber, 2005). Consider the example of men’s preferences for women’s body size, which is hypothesized to represent a preference for healthy weight given the local environmental conditions. Men living in areas of food scarcity prefer higher BMI women, as this is most adaptive, while men in areas of food security prefer lower BMI women, as this is most adaptive given the local conditions (Tovée et al., 2006). This same hypothesis follows equally from a massive modularity, Santa Barbara school approach as from a mental plasticity, cultural evolution approach. The Santa Barbara school approach predicts that an evolved mental module for body size preference should have been selected to be sensitive to local ecological conditions, and would therefore predict the pattern of higher BMI preferences in areas of food scarcity and lower BMI preferences in areas of food security. A more moderate modularity approach would predict a mental module for attractiveness that can learn the appropriate preferences given the local ecological conditions, and thus predict the same pattern. Finally, a mental plasticity,

cultural evolution approach would predict that culturally transmitted body size preferences would result in fitness benefits for those who carried the appropriate body size preference given the local ecological conditions, and would therefore predict the same pattern. It is not necessary to commit to one of these models of mind in order to formulate hypotheses based on evolutionary predictions (Burke, 2014). The necessary foundational principles are merely that behavior, cognition and perception have fitness consequences, and that selection shapes behavior, perception and cognition; something upon which all researchers adopting evolutionary approaches to psychology can surely agree.

While mainstream cognitive psychology and neuroscience are producing some convincing data that different types of information are processed in different brain regions—which could be considered modules—and there have been some well-reasoned defenses of the concept of massive modularity (e.g., Barrett and Kurzban, 2006), the conception of the massively modular mind lacks sufficient empirical evidence (Laland and Brown, 2011). Burke (2014) points out that, in the absence of alternative formally articulated sets of foundational principles, the Santa Barbara school's formulation presents critics of evolutionary approaches to psychology with a supposed foundational principle that lacks a solid empirical basis, and allows these critics to dismiss the entire field as built on shaky foundations. Ironically, the criticism that is aimed at evolutionary approaches to psychology (which, it should be noted, began well before the formalization of the Santa Barbara principles) provides substantial pressure to formalize that other disciplines did not have to weather during their early stages (Rozin, 2001). Laland and Brown (2011) point out that Wilson felt that sociobiology was held up to unfair standards: "While the sociological or cultural model is assumed to be true unless proven false beyond any possible doubt, the biological model is assumed to be false unless evidence is completely unassailable in their support." This could also be said of evolutionary approaches to psychology more generally.

So where to from here? Others in this volume argue that the massive modularity of mind is an empirical question (Barrett et al., 2014), and I strongly agree. It may well turn out to be true, but before identifying this model of mind as a foundational principle, it is important to ensure that it is well supported empirically. In the meantime, it is encouraging to note that the early attempt to formalize foundational principles has not led to the over-focus on a small number of topics and techniques that Rozin (2001) decries in social psychology. Evolutionary approaches to psychology investigate a wide range of topics, from mate selection, life history strategy, food gathering and sharing, cooperation and altruism, aggression, gender roles, and parenting, and use a wide range of techniques—experimental psychological techniques, game theory, ethology, and ethnographic observations to name but a few. Anyone who attends HBES, EHBEA, ISHE or any of the other conferences dedicated to the approach will discover that new fields of study are constantly being approached through the lens of evolutionary theory.

In conclusion, then, while there is pressure from critics of the field to declare a set of foundational principles for the field, including determining whether or not the mind is domain specific and massively modular, these are empirical questions that require further research. Further, the structure of the mind is not a prerequisite for the investigation of psychology through an evolutionary lens. The field should therefore continue to research the question of modularity of mind, and continue to explore the broad range of human behavior and cognition through observation, documentation and hypothesis generation and testing. There is little to be gained by prematurely formalizing the foundations of the field—putting the theory before the data—particularly if those foundations later turn out to be shaky.

ACKNOWLEDGMENT

I would like to thank Prof Dick Stevenson for his discussion about the topic.

REFERENCES

Barrett, H. C., and Kurzban, R. (2006). Modularity in cognition: framing the debate. *Psychol. Rev.* 113, 628–647. doi: 10.1037/0033-295X.113.3.628

- Barrett, L., Pollet, T., and Stulp, G. (2014). From computers to cultivation: reconceptualising evolutionary psychology. *Front. Psychol.* 5:867. doi: 10.3389/fpsyg.2014.00867
- Benton, T. (2000). "Social causes and natural relations," in *Alas Poor Darwin: Arguments Against Evolutionary Psychology*, eds H. Rose and S. Rose (New York, NY: Harmony Books), 249–270.
- Burke, D. (2014). Why isn't everyone an evolutionary psychologist? *Front. Psychol.* 5:910. doi: 10.3389/fpsyg.2014.00910
- Cosmides, L., and Tooby, J. (1987). "From evolution to behaviour: evolutionary psychology as the missing link," in *The Latest on the Best: Essays on Evolution and Optimality*, ed J. Dupre (Cambridge, MA: The MIT Press), 277–306.
- Kurzban, R. (2002). Alas poor evolutionary psychology: unfairly accused, unjustly condemned. *Hum. Nat. Rev.* 2, 99–109. Available online at: <http://human-nature.com/nibbs/02/apd.html>
- Laland, K., and Brown, G. (2011). *Sense and Nonsense: Evolutionary Perspectives on Human Behaviour*, 2nd Edn. Oxford: Oxford University Press.
- Richer, J. (2014). "Disordered" behaviour. Alternatives to DSM-5 from an ethological perspective. *Hum. Ethol. Bull.* 29, 27–55. Available online at: http://media.anthro.uni.vie.ac.at/ishj_journal/index.php/heb/article/view/113/100
- Rozin, P. (2001). Social psychology and science: Some lessons from Solomon Asch. *Pers. Soc. Psychol. Rev.* 5, 2–14. doi: 10.1207/S15327957PSPR0501_1
- Sperber, D. (2005). "Dan Sperber. 2005. Modularity and relevance: how can a massively modular mind be flexible and context-sensitive?," in *The Innate Mind: Structure and Content*, eds P. Carruthers, S. Laurence, and Stich, S (Oxford: Oxford University Press), 53–68.
- Tovée, M. J., Swami, V., Furnham, A., and Mangalparsad, R. (2006). Changing perceptions of attractiveness as observers are exposed to a different culture. *Evol. Hum. Behav.* 27, 443–456. doi: 10.1016/j.evolhumbehav.2006.05.004

Conflict of Interest Statement: The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Received: 25 August 2014; accepted: 24 September 2014; published online: 10 October 2014.

Citation: Stephen ID (2014) Putting the theory before the data: is "massive modularity" a necessary foundation of evolutionary psychology? *Front. Psychol.* 5:1158. doi: 10.3389/fpsyg.2014.01158

This article was submitted to *Evolutionary Psychology and Neuroscience*, a section of the journal *Frontiers in Psychology*.

Copyright © 2014 Stephen. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) or licensor are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

FRONTIERS FOCUSED REVIEWS: THE BEST ARTICLES REACH A BROADER COMMUNITY

[Home](#) [About](#) [Submit](#) [Advertise & PR](#)

[REGISTER](#) [LOGIN](#)

[Science](#)

[Medicine](#)

[Technology](#)

[Society](#)

[Culture](#)

[My Frontiers](#)

[Search](#)



frontiers
IN PSYCHOLOGY



[Journal](#)

[Community](#)

JULY 14, 2011

Journal Info

Home
 About the Journal
 Editorial Board
 Archive
 Research Topics
 View Some Authors
 Review Guidelines
 Search



Article Type

All

Publication Date

From

To



Author Info

Why Submit?

Fees

Article Types

Author Guidelines

Submission Checklist

Contact Editorial Office

Submit Manuscript

Review Guidelines

Frontiers Reviews significantly redefine the assignments for both authors and editors in order to guarantee the most accurate, efficient and impartial reviews in academic publishing. Frontiers reviews largely rely on the advanced IT functionalities of the Frontiers platform and are typically articulated into two consecutive phases:

INDEPENDENT REVIEW

During the Independent Review phase, the review editors assess the paper independently from each other and the authors, according to a standardized review template.

INTERACTIVE REVIEW

During the Interactive Review phase, authors and Review Editors can interact with each other through real-time comments in the discussion forum. The Associate Editor and if required the Specialty Chief Editor can also enter the Review Forum and oversee this review process.

[Frontiers Review at a Glance](#)

[Frontiers Full Review](#)

[Frontiers Short Review](#)

Frontiers Review at a Glance

The [Frontiers Review System](#) provides and guarantees:

OPEN REVIEWS

Frontiers is striving to remove any bias from the review process and acknowledge the reviewers for the significant contributions in improving the paper. To guarantee the most transparent and objective reviews, the identities of review editors remain anonymous during the review period. Only in case an article is accepted do their names appear on the published manuscript, without exceptions. However, if for any reasons a review editor withdraws during any stage of the review process, his/her name will not be disclosed.

STANDARDIZED AND HIGH QUALITY REVIEWS

Frontiers provides a review template to make reviews systematic and convene the efforts of review editors exclusively on objective issues. The review must focus solely on the quality of both the research and the manuscript, and aim at providing constructive comments to bring the final paper to its best quality. This allows fair, rapid, comprehensive and comparable assessment of research. The evaluation of the research will be done successively by means of the [Frontiers Evaluation System](#). Moreover, Frontiers provides authors with the highest quality review service by assigning only the world's top researchers to the Frontiers Boards of editors.

INTERACTIVE REVIEWS

Our Interactive Review Forum facilitates the review process by enabling all participants (authors, review editors, the associate editor and, if need be, the specialty chief editor) to view reports and directly communicate with one another to easily address comments regarding an article. Indeed, the goal of the Interactive Review is to facilitate convergence of opinions. This phase allows unlimited rounds of reviews and resubmissions, until the manuscript is deemed acceptable.

RAPID PAPER PENDING PUBLICATIONS

Once the Interactive Review Forum is activated, Frontiers allows to immediately publish the abstract of an article in review as "paper pending". By securing the public declaration date of the discovery, the paper pending allows a pressure-free and most effective collaboration with the review editors towards improving the manuscript, without the concern that the authors' discovery might be scooped while the review is on-going.

OBJECTIVE REVIEW

Frontiers promotes a strict separation between [review](#) and [evaluation](#). Review editors may comment only in regard to objective issues and may reject research papers based exclusively upon objective errors. The mandate for review editors is to ensure that the results are valid, the analysis is flawless and the quality as high as possible. The significance of articles is separately evaluated by the entire community by means of the [Frontiers Evaluation System](#).

ARBITRATIONS

Should a dispute arise that threatens to reject an article, the author may trigger arbitration. In the first place, the associate editor will arbitrate and involve all review editors in a discussion aimed at resolving the dispute. If a resolution cannot be agreed upon, the specialty chief editor is alerted and can opt to bring in additional review and associate editors for consultation. An article can be rejected if the arbitration rules that the objective error stands. Review editors are entitled to trigger arbitration, too, if they reckon that the author is reluctant to make required changes. Review editors may withdraw from the review process if they disagree with other editors, the authors and the arbitration rulings (in which case their identity remains undisclosed). The withdrawal of a review editor requires the recruitment of a new one, and significantly slows down the process. Therefore, authors are encouraged to co-operate as much as possible in addressing the concerns of the review editors involved with their articles.

Full Peer Review

The following articles types are attributed a full, standardized peer review:

Tier 1: [Original Research Articles](#), [Hypothesis & Theory Articles](#), [Perspective Articles](#), [Methods Articles](#), [Clinical Case Studies](#), [Mini Reviews](#) and [Review Articles](#).

Tier 2: [Focused Reviews](#)

POST SUBMISSION STEPS

Following the Frontiers online manuscript submission, an associate editor of the relevant Frontiers Specialty is immediately invited to take on the manuscript editorial assignment. After a preliminary content check, the associate editor may either decide to send the manuscript out for review or recommend it for immediate rejection to the specialty chief editor.

In the latter case, the specialty chief editor may confirm the associate editor's recommendation of immediate article rejection due to the following reasons:

- An objective error (generally accepted by the community and not one that would be debatable by some);
- An excessive amount of language errors;
- Lack of research quality or ethical standards.

The specialty chief editor may, nevertheless, override the associate editor's recommendation and decide that the manuscript deserves being reviewed, in which case he/she will assign the article to a new associate editor who agrees to send the article for review.

The associate editor then assigns the article to at least two review editors, either selected from the Frontiers Board of review editors or appropriately recruited among the experts in the area. The whole process described above is a rapid one, since review editors are invited within one week from article submission and must accept or decline a review invitation within a few business days.

INDEPENDENT REVIEW PHASE

Within ten days after being assigned to an article, the review editors shall submit the standardized Frontiers Independent Review Report via the online review forum. The associate editor is automatically notified as soon as each of the Independent Review Reports is submitted.

During the Independent Review phase, the review editors assess the paper independently from each other and the authors, according to our [standardized review](#) template.

Once all review editors have submitted an Independent Review Report, the associate editor is responsible for activating the successive phase of the Frontiers Review, i.e. the Interactive Review Forum. Even if the Independent Review Reports are unfavorable to the authors, the Interactive Review Forum must be activated to allow authors the opportunity of rebuttal.

INTERACTIVE REVIEW PHASE

Once the associate editor activates the Interactive Review Forum, authors are immediately notified to enter the forum, where they are able to view the review comments, and have up to two months to prepare responses and/or a revised manuscript resubmission, if necessary.

The associate editor monitors the discussions occurring between authors and review editors within this forum, and ensures not only the timeliness, but also the constructiveness of the participants' interaction. Should a dispute arise at this stage, the associate editor must act as a mediator, working with all parties involved to resolve the issues and even inviting new review editors for further opinions. If the disagreement persists, the specialty chief editor is then obliged to enter the Interactive Review Forum, examine the situation and take a final decision, as to whether the review should be ended by article rejection or continued by a new set of editors.

When a disagreement cannot be resolved to the satisfaction of a review editor, the latter is in full right to withdraw from the review at any phase, in which case the associate editor will invite another review editor.

At this stage, a manuscript may be rejected for the following reasons:

- an objective error is found that cannot be corrected;
- experiments are found to be invalid;
- authors are unable or unwilling to address issues raised by the review editors.

The review is complete once all review comments are addressed to the review editors' satisfaction.

ARTICLE ACCEPTANCE

If the review editors are satisfied with the authors' efforts at amending the manuscript, they then briefly finalize their Interactive Review Reports, which automatically notifies the associate editor of article acceptance. The associate editor accepts the final version of the manuscript within five days, and this action does not require the approval of the specialty chief editor.

Once a manuscript is accepted, the authors receive an automated notification informing them of the acceptance and the provisional PDF will instantly appear online. Review editors are invited to publish a one-page joint commentary to be linked to the published article, however this is not mandatory. Payment of the publication fee is required within thirty days of acceptance and necessary before final publication of the manuscript.

REJECTION

Articles can only be rejected by the chief editor, while the associate editor who handles an article can only recommend to reject an article. The chief editor may override an associate editor's recommendation to reject the article and insist to call in further review editors to continue the review process.

TIER 2

If the submitted article is a [Focused Review](#), i.e. a prestigious, invitation-only, tier 2 review highlighting an outstanding tier 1 article, the previous Associate and Review Editors are assigned the review of the new manuscript again (if available to take on the article). This manuscript is again written by the previous authors and is an abridged and revised version of the original article following the author guidelines for Focused Reviews. It requires a full peer review in regard to technical language, since it addresses a broader, less specialized community.

Short Peer Review

The following articles types are attributed a shortened peer review:

Tier 1: [Commentaries](#), [Opinion Articles](#), [Editorials](#) and [Book Reviews](#).

Tier 2: [Frontiers Commentaries](#).

Short peer reviews differ from full peer reviews mainly in two aspects: they are directly forwarded to the Interactive Review phase and they may be

reviewed by the Associate Editor alone. It is up to the Associate Editor's consideration if further reviewers are invited to the review process.

Therefore, following the Frontiers online manuscript submission, an Associate Editor of the relevant Frontiers Specialty is immediately invited to take on the manuscript editorial assignment, which encompasses the role of the reviewer, too. Since no Independent Review Report is required, the Associate Editor directly activates the Interactive Review Forum by carrying out the review.

Interactive Review, and article acceptance and rejection follow exactly the same rules established for full peer reviews.

TIER 2

If the submitted article is a [Frontiers Commentary](#), i.e. a prestigious, invitation-only, tier 2 commentary emphasizing an outstanding tier 1 article, the original Specialty Chief Editor is assigned the short review of the new manuscript. This manuscript is written by the Associate or Review Editor/s who reviewed the original article and requires a short peer review in regard to technical language, since it addresses a less specialized community.

[Home](#)
[About Frontiers](#)
[Contact Frontiers](#)

[Register with Frontiers](#)
[Submit Manuscript](#)
[Submit Abstract](#)

[Shopping](#)
[Advertise](#)
[Donate](#)

[Website Terms of Use](#)
[Privacy Policy](#)
[Copyright Statement](#)



© 2007 - 2011 Frontiers Media S.A. All Rights Reserved