

Dr. Foster: Article 2008-0571 is available for download

=====

Developmental Psychology Published by American Psychological Association

Dear Author,

The page proof of your article (# 2008-0571), which has been accepted for publication in Developmental Psychology, is now ready for your final review. To access your proof, please refer to this URL:

<http://rapidproof.cadmus.com/RapidProof/retrieval/index.jsp>

Login: your e-mail address

Password: ----

The site contains one file. You will need to have Adobe Acrobat® Reader software (Version 4.0 or higher) to read it. This free software is available for user downloading at <http://www.adobe.com/products/acrobat/readstep.html>.

If you have any problems with downloading your article from the Rapid Proof site, please contact rapidprooftech@cadmus.com. Please include your article number (2008-0571) with all correspondence.

This file contains a reprint order form, information regarding subscriptions and special offers, and a copy of the page proof for your article. The proof contains 4 pages.

Please read over your article carefully, as this will be your last opportunity to review the article prior to publication. It has been copyedited to conform to APA style, as described in the Publication Manual of the American Psychological Association (5th ed.), and for grammar, punctuation usage, and formal consistency. Other changes in wording are intended to more clearly convey your meaning; if meaning has been altered, please suggest an alternative that will restore the correct meaning and clarify the original passage. The references have been checked against citations; simple discrepancies have been resolved, whereas substantive edits have been flagged for your attention.

Proofread all elements of your article carefully. Be sure to check all of the following:

- Tables
- Equations and mathematical symbols
- Figures (including checking figure and caption placement)
- Non-English characters and symbols

Please respond to any queries that appear on the last page of the proof. Any extensive, nonessential changes and extensive changes due to author error will incur charges.

Because of APA's tightened production schedules, it is imperative that we receive any changes within 48 business hours. If you have no changes, email the manuscript editor at Developmental@apa.org that you have no changes. If you have minimal changes, summarize them in an email to the manuscript editor at Developmental@apa.org, clearly indicating the location of each change. If you are within the continental United States and have extensive changes, send a clearly marked proof to the postal address given at the end of this message. If you are outside the continental United States and have extensive changes, fax a

clearly marked proof to the manuscript editor at the fax number given at the end of this message.

To order reprints, please fill out the reprint order form and return it to Cadmus Reprints, Reprint Account Manager, P.O. Box 751903, Charlotte, NC 28275-1903.

For information about the NIH Pubmed Central deposit request as it relates to articles published in APA journals, including a Pubmed Central deposit request form, please go to <http://www.apa.org/journals/authors/pubmed-deposit.html>.

This article has not yet been selected to appear in an issue. The Editor makes all decisions concerning publication order.

If you have questions or concerns about the editing of your proofs, please contact me at the email address below.

Sincerely,

Manuscript Editor
Developmental Psychology
APA Journals Office
750 First Street, NE
Washington, DC 20002-4242
Tel: 202-336-5540
E-mail: Developmental@apa.org
FAX (for non-U.S. authors): 202-336-5549

REPRINTS

Authors have two options for ordering reprints:

Authors who need to use purchase orders may order reprints from the standard *Purchase Order Service*. For a substantially lower price, authors may use the *Prepaid Service*. The rate schedules on page 3 give the prices for each service. All international prices include shipping via WWDS. All domestic shipments will be made via UPS. We request that you do not use Post Office box numbers; provide a full street address if possible. Authors may request expedited shipping – the additional cost will be billed. You are required to pay all duties if they apply.

- **Prepaid Service:** To take advantage of this lower price option, submit your credit card information with your order or enclose a money order, certified check, or personal check. The prices given on page 3 include postage.
- **Purchase Order Service:** Reprint orders that are not prepaid must be accompanied by a purchase order. Cadmus Reprints will bill you later for the cost of the reprints. **Do not send remittance with the reprint order form and purchase order.** Remember that the price you see on page 3 includes postage, so it is the exact amount you will be billed. (Exception: Authors requesting expedited shipping will be billed the additional cost.)

Complete the order form on the next page and return it to Cadmus Reprints (not to APA). Only one order form is provided – include your coauthors' orders on this form or make photocopies of the order form for your coauthors. Check the box for either the prepaid service or the purchase order service. Give explicit instructions for all authors receiving reprints, using the space at the bottom of the order form.

To determine the cost of the reprints, count the number of pages in the printed article and refer to the rate schedules on page 3. For example, if your article is 11 pages long, you want 100 reprints, you live in the United States, and you are using the prepaid service, your total cost would be \$118. If your proof includes a page of queries following the text, do not include the query page in your article count.

Send the order form to Cadmus Reprints when you return the page proofs. Reprints will be mailed within two weeks of the publication of the journal. Orders received after the issue goes to press will be processed with the next issue.

Where to Order Reprints

Send your order form with credit card information, money order, certified check, personal check, or purchase order in the amount indicated on the rate schedule to:

Cadmus Reprints
P.O. Box 751903
Charlotte, NC 28275-1903

Phone: (410) 819-3914 FAX: (410) 820-9765

Personal checks must clear before reprints are processed. There is a \$30.00 charge for returned checks.



AMERICAN
PSYCHOLOGICAL
ASSOCIATION

2008 REPRINT ORDER FORM

APA Journal Authors: To order reprints, complete all sections of this form. Please read the instructions on page 1.

Developmental Psychology

3320071

2008-0571

SEND the reprint order and

- (1) credit card number, or
- (2) money order/certified check, or
- (3) approved purchase order, or
- (4) check

to:

Cadmus Reprints
P.O. Box 751903
Charlotte, NC 28275-1903

BILLING NAME _____

ORGANIZATION _____

ADDRESS (no P.O. Box) _____

CITY _____ STATE _____ ZIP CODE _____

ARTICLE TITLE _____

AUTHOR _____

DATE _____

PHONE # _____

FAX # _____

E-MAIL _____

REPRINTS INCLUDE COLOR? YES NO

OF TOTAL ARTICLE PAGES _____

OF REPRINTS _____

OF COVERS _____

PAYMENT METHOD: CHECK ONE:

___ CREDIT CARD CARD NUMBER _____

___ VISA EXPIRATION DATE _____

___ MASTERCARD SIGNATURE _____

___ MONEY ORDER/CERT. CHECK (make payable to **Cadmus Reprints**)

___ APPROVED PURCHASE ORDER (original PO must be attached)

___ CHECK (shipment delayed until check clears)

COMPUTE COST OF ORDER

PRICE (per chart) \$ _____

Add'l for Covers \$ _____

SUBTOTAL \$ _____

PA residents add 6% tax \$ _____

Add'l for Expedited Shipping \$ _____

TOTAL \$ _____

COMPLETE SHIPPING LABEL below. No P.O. Boxes.

Include phone number on international shipments. International shipments can be made via AIR for additional charges; please indicate in Special Shipping Instructions if you desire this expedited service.

(TYPE OR PRINT MAILING LABEL BELOW)

SHIP TO:	Phone No. _____
Name _____	
Address _____	

City _____	State _____ Zip _____
Expedited Service (enter service required): _____	



RATES EFFECTIVE WITH 2008 ISSUES

Black and White Reprint Prices Prepaid						
Domestic (USA only)						
# of Pages	50	100	200	300	400	500
1-4	\$53	\$71	\$80	\$109	\$139	\$168
5-8	\$68	\$91	\$138	\$182	\$228	\$276
9-12	\$88	\$118	\$186	\$259	\$332	\$407
13-16	\$100	\$147	\$239	\$332	\$426	\$518
17-20	\$118	\$175	\$287	\$409	\$523	\$641
21-24	\$137	\$200	\$341	\$481	\$620	\$763
Covers	\$64	\$70	\$93	\$117	\$143	\$168

Color Reprint Prices Prepaid						
Domestic (USA only)						
# of Pages	50	100	200	300	400	500
1-4	\$113	\$192	\$270	\$363	\$422	\$462
5-8	\$177	\$232	\$346	\$506	\$612	\$717
9-12	\$195	\$257	\$399	\$588	\$772	\$914
13-16	\$211	\$277	\$456	\$668	\$882	\$1,093
17-20	\$232	\$300	\$515	\$754	\$991	\$1,277
21-24	\$253	\$322	\$575	\$838	\$1,102	\$1,465
Covers	\$64	\$70	\$93	\$117	\$143	\$168

Black and White Reprint Prices Prepaid						
International (includes Canada and Mexico)						
# of Pages	50	100	200	300	400	500
1-4	\$77	\$93	\$114	\$162	\$205	\$253
5-8	\$106	\$125	\$204	\$278	\$354	\$432
9-12	\$141	\$171	\$282	\$403	\$515	\$637
13-16	\$169	\$214	\$365	\$516	\$669	\$819
17-20	\$205	\$260	\$444	\$639	\$825	\$1,013
21-24	\$235	\$298	\$525	\$753	\$979	\$1,206
Covers	\$89	\$95	\$136	\$187	\$235	\$284

Color Reprint Prices Prepaid						
International (includes Canada and Mexico)						
# of Pages	50	100	200	300	400	500
1-4	\$137	\$214	\$304	\$416	\$489	\$547
5-8	\$215	\$266	\$413	\$602	\$739	\$873
9-12	\$249	\$309	\$495	\$731	\$956	\$1,144
13-16	\$280	\$345	\$582	\$853	\$1,125	\$1,394
17-20	\$318	\$385	\$671	\$984	\$1,292	\$1,648
21-24	\$351	\$420	\$760	\$1,110	\$1,462	\$1,909
Covers	\$89	\$95	\$136	\$187	\$235	\$284

Black and White Reprint Prices Purchase Order						
Domestic (USA only)						
# of Pages	50	100	200	300	400	500
1-4	\$57	\$77	\$87	\$119	\$151	\$183
5-8	\$74	\$99	\$149	\$197	\$248	\$299
9-12	\$95	\$128	\$202	\$281	\$360	\$441
13-16	\$109	\$159	\$259	\$360	\$462	\$562
17-20	\$128	\$190	\$312	\$444	\$568	\$696
21-24	\$148	\$217	\$370	\$522	\$672	\$828
Covers	\$69	\$76	\$101	\$127	\$155	\$182

Color Reprint Prices Purchase Order						
Domestic (USA only)						
# of Pages	50	100	200	300	400	500
1-4	\$122	\$208	\$293	\$394	\$458	\$501
5-8	\$192	\$251	\$376	\$549	\$665	\$778
9-12	\$212	\$278	\$433	\$638	\$838	\$992
13-16	\$229	\$301	\$495	\$725	\$957	\$1,186
17-20	\$251	\$325	\$559	\$818	\$1,076	\$1,385
21-24	\$275	\$350	\$624	\$910	\$1,196	\$1,590
Covers	\$69	\$76	\$101	\$127	\$155	\$182

Black and White Reprint Prices Purchase Order						
International (includes Canada and Mexico)						
# of Pages	50	100	200	300	400	500
1-4	\$84	\$101	\$123	\$176	\$223	\$275
5-8	\$115	\$136	\$222	\$301	\$385	\$469
9-12	\$154	\$185	\$306	\$437	\$559	\$691
13-16	\$183	\$233	\$396	\$560	\$725	\$888
17-20	\$222	\$282	\$481	\$693	\$895	\$1,099
21-24	\$255	\$323	\$570	\$817	\$1,063	\$1,309
Covers	\$97	\$103	\$148	\$203	\$255	\$308

Color Prices Purchase Order						
International (includes Canada and Mexico)						
# of Pages	50	100	200	300	400	500
1-4	\$149	\$232	\$330	\$451	\$530	\$593
5-8	\$233	\$288	\$448	\$653	\$801	\$947
9-12	\$270	\$335	\$537	\$793	\$1,037	\$1,241
13-16	\$304	\$374	\$632	\$925	\$1,221	\$1,513
17-20	\$345	\$418	\$729	\$1,068	\$1,402	\$1,788
21-24	\$381	\$456	\$824	\$1,205	\$1,586	\$2,071
Covers	\$97	\$103	\$148	\$203	\$255	\$308

Additional Rates	
Set title page, each	\$16.00
Each extra mailing	\$32.00
Remake pages, each	\$50.00

Subscriptions and Special Offers

In addition to purchasing reprints of their articles, authors may purchase an annual subscription, purchase an individual issue of the journal (at a reduced rate), or request an individual issue at no cost under special "hardship" circumstances.

To place your order, fill out the order form below (including the mailing label) and send the completed form and your check or credit card information to the address listed on the order form.

For information about becoming a member of the American Psychological Association, call the Membership Office at 1-800-374-2721.

2008 APA Journal Subscription Rates

Journal*	Individual Rate	APA Member Rate
American Psychologist	\$ 261	\$ 12
Behavioral Neuroscience	\$ 272	\$ 143
Developmental Psychology	\$ 236	\$ 110
Emotion	\$ 98	\$ 52
Experimental & Clinical Psychopharm.	\$ 126	\$ 57
Health Psychology	\$ 106	\$ 63
Jrnl of Abnormal Psychology	\$ 146	\$ 67
Jrnl of Applied Psychology	\$ 208	\$ 95
Jrnl of Comparative Psychology	\$ 84	\$ 52
Jrnl of Consulting & Clinical Psychology	\$ 251	\$ 114
Jrnl of Counseling Psychology	\$ 103	\$ 52
Jrnl of Educational Psychology	\$ 161	\$ 73
JEP: Animal Behavior Processes	\$ 109	\$ 52
JEP: Applied	\$ 84	\$ 52
JEP: General	\$ 84	\$ 52
JEP: Human Perception & Performance	\$ 332	\$ 152
JEP: Learning, Memory & Cognition	\$ 332	\$ 152

Journal*	Individual Rate	APA Member Rate
Jrnl of Family Psychology	\$ 126	\$ 57
Jrnl of Personality & Social Psychology	\$ 464	\$ 214
Neuropsychology	\$ 126	\$ 57
Professional Psych.: Research & Practice	\$ 126	\$ 57
Psychological Assessment	\$ 126	\$ 57
Psychological Bulletin	\$ 208	\$ 96
Psychological Methods	\$ 84	\$ 52
Psychological Review	\$ 156	\$ 71
Psychology & Aging	\$ 144	\$ 67
Psychology of Addictive Behaviors	\$ 84	\$ 70
Psychology, Public Policy & Law	\$ 84	\$ 52
Rehabilitation Psychology	\$ 84	\$ 57

*For journal descriptions, see APA's Web site:
<http://www.apa.org/journals>

CUT ALONG DASHED LINE – RETURN LOWER PORTION TO APA ORDER DEPARTMENT

Instructions: Check the appropriate box, enter journal title and price information, and complete the mailing label in the right column. Enclose a check made out to the **American Psychological Association**, and mail it with the form to the APA Order Department or complete the credit card information below.

Annual Subscription (available on January-December basis only). To subscribe, specify calendar year of the subscription. Refer to the Subscription Rates shown above.

Journal: _____

Calendar year of subscription: _____ Price: _____

Special Offers! If you are an APA journal article author, you may take advantage of two Special Offers. (These offers do not apply to Educational Publishing Foundation journals.)

Individual Copy. You may order individual copies of the entire issue in which your article appears. As an author, you receive a special reduced rate of \$5 per copy for up to a maximum of 25 copies. No phone requests accepted.

Journal: _____

Vol. no.: _____ Issue no.: _____ Issue month: _____

_____ copies @ \$5 a copy = \$ _____ (order amount)
 + _____ (handling; see below)

TOTAL enclosed: \$ _____

Handling Fees		
Order amount:	U.S.	International
< \$15	\$5	\$15
\$15 - \$60	\$6	\$16
> \$60	Order amount X .10	\$20

Hardship Request. If you do not have a personal subscription to the journal and you do not have access to an institutional or departmental subscription copy, you may obtain a single copy of the issue in which your article appears at no cost by filing out the information below.

Journal: _____

Vol. no. : _____ Issue no.: _____

Issue month: _____

CREDIT CARD PAYMENT

___ VISA ___ MASTERCARD ___ AMERICAN EXPRESS

CARD NUMBER _____

Expir. Date _____ Signature _____

PRINT CLEARLY – THIS IS YOUR MAILING LABEL

SHIP TO:	Phone No. _____
Name _____	
Address _____	

City _____ State _____ Zip _____	
Expedited Service (enter service required): _____	

Send the completed form and your check, made out to the **American Psychological Association**, or your credit card information to:

APA Order Department
750 First Street, NE
Washington, DC 20002-4242

All orders must be prepaid. Allow 4-6 weeks after the journal is published for delivery of a single copy or the first copy of a subscription.

New Methods for New Questions: Obstacles and Opportunities

E. Michael Foster

University of North Carolina, Chapel Hill

Ariel Kalil

University of Chicago

Two forces motivate this special section, “New Methods for New Questions in Developmental Psychology.” First are recent developments in social science methodology and the increasing availability of those methods in common software packages. Second, at the same time psychologists’ understanding of developmental phenomena has continued to grow. At their best, these developments in theory and methods work in tandem, fueling each other. Newer methods make it possible for scientists to better test their ideas; better ideas lead methodologists to techniques that better reflect, capture, and quantify the underlying processes. The articles in this special section represent a sampling of these new methods and new questions. The authors describe common themes in these articles and identify barriers to future progress, such as the lack of data sharing by and analytical training for developmentalists.

Keywords: methodology, causal inference, latent class

This special section, “New Methods for New Questions in Developmental Psychology,” was motivated by two forces. The first involves recent developments in social science methodology and the increasing availability of those methods in common software packages. Widely available software offers new methods for handling missing data, multilevel models, data collected under complex sampling schemes, and alternative measurement models (such as item response theory) to name just a few. What is most striking is that many of these methods are now available in combinations. One can model latent classes at different levels in a multiclass model with data that were collected with differential probabilities of selection under alternative assumptions for missing data. Although many of these methods have been available to the methodological elite for some time, they required knowledge of complicated computer languages and of substantive areas, such as numerical optimization.

At the same time, psychologists’ understanding of developmental phenomena has continued to grow. Our understanding of neighborhood effects, for example, has moved from analyses of poverty rates in census tracts to a more refined understanding of the underlying mechanisms that influence children’s growth and well-being, such as collective efficacy (Elliott et al., 1996; Sampson, Raudenbush, & Earls, 1997) and the ways families manage their resources (Furstenberg, Cook, Eccles, Elder, & Sameroff, 1999).

At their best, these developments in theory and methods work in tandem, fueling each other. Newer methods make it possible for scientists to better test their ideas; better ideas lead methodologists to methods that better reflect, capture, and quantify the underlying processes.

The articles in this special section represent a sampling of these new methods and new questions. The articles cover a range of methods, but some common themes emerge. The most common involves person-centered approaches, such as latent class analyses or configural frequency analysis (Mun, von Eye, Bates, & Vascillo, 2008; von Eye, Mun, & Bogat, 2008). These methods are particularly well suited for questions concerning diagnoses or for identifying subgroups of individuals with particular traits (e.g., particularly amenable to intervention). Other articles extend these models in important ways by examining the dynamics of behavior (Flaherty, 2008; Kaplan, 2008; Lanza & Collins, 2008;).

AQ: 1

Causal modeling was the focus of four articles, and these articles addressed an area in which developmental psychologists have much to learn from other social scientists and statisticians. The articles included here help teach not only that some degree of causal inference is possible outside of an experiment, but also that across the field, we psychologists must strengthen our arguments and analytic methods to make such inferences. Many of the articles submitted to *Developmental Psychology* rush to one of two extremes: They either argue that causal modeling is impossible outside of an experiment or make wild causal claims based on weak arguments. For example, developmentalists often claim that temporal ordering establishes causality. For example, simply flipping through the journal, it is easy to find articles claiming that if X precedes Y , then X causes Y , or that if X_t is related to Y_t , controlling for Y_{t-1} , then X causes Y . Neither claim is necessarily true. Both reflect considerable methodological and conceptual confusion: For example, t and $t-1$ may represent time points of measurement and may have no significance for the underlying developmental processes. Furthermore, controlling for Y_{t-1} actually may make a causal interpretation more difficult (Glymour, Weuve, Berkman, Kawachi, & Robins, 2005). For example, including lagged dependent variables as explanatory variables creates statistical problems in the presence of autocorrelated errors, a problem that has been known in other social sciences for four decades (Durbin, 1970; Taylor & Wilson, 1964). Still, temporal ordering can help identify causal relationships. That ordering, however, is neither sufficient nor necessary for doing so.

E. Michael Foster, Department of Maternal and Child Health, School of Public Health, University of North Carolina, Chapel Hill; Ariel Kalil, Harris School of Public Policy, University of Chicago.

Correspondence concerning this article should be addressed to E. Michael Foster, School of Public Health, University of North Carolina, Chapel Hill, Rosenau Hall, Campus Box 7445, Chapel Hill, NC 27599-7445. E-mail: emfoster@unc.edu

Three articles represent applications of the latest developments in this area of methodology, some of them borrowing from other fields with rich traditions of work on this problem (Gennettian, Magnuson, & Morris, 2008; Hong, & Yu, 2008; Stuart & Green, 2008). A fourth article (Haviland, Nagin, Rosenbaum, & Tremblay, 2008) extends these methods to a longitudinal context.

Other articles applied methods that are well known outside of psychology but have been used relatively little in developmental studies. These include qualitative and mixed-methods research (Yoshikawa, Weisner, Kalil, & Way, 2008) and data mining (Gruenewald, Mroczek, Ryff, & Singer, 2008). Another article examined a growing area in psychology (i.e., the interaction of genes and environment; Price & Jaffee, 2008). Another article combined a traditional concern of psychologists (measurement) with the creative use of data (Curran et al., 2008). Guryan, Jacob, Klopfer, and Groff (2008) contributed an article that made use of technology in a novel way to answer questions of long-standing interest in the field. All of the articles applied these methods to substantive questions of interest.

What do these articles tell psychologists about the development of theory and methods? Progress appears a bit uneven. Some of the methods do seem to be in search of a theory. For example, the application of latent class analysis in developmental psychology seems stunted by uncertainty about whether the underlying constructs are actually discrete rather than continuous. This uncertainty is understandable given the limited usefulness of data for distinguishing the two models (Bartholomew, 1987). Hopefully, these developments will lead psychologists to probe more deeply into the question of whether the phenomena of interest involve discontinuities and, in turn, to consider of what discrete constructs imply for measurement.

In some instances, in contrast, theory does seem to spur a method's development. For example, dyadic interactions are a linchpin of developmental psychology. For many years, researchers have largely chosen one construct to be the dependent variable (e.g., children's behavior) and another to be the explanatory variable (e.g., parenting). Theory indicates that such variables influence each other and evolve together, but (with notable exceptions) empirical work seldom incorporates such simultaneity (Patterson, 1986). The articles in this section move the methodology for modeling dyads forward in a way that better reflects the underlying theory.

The articles and the topics covered—as well as the topics not covered—identify areas for future research. Broad areas of social science methodology are completely missing from the articles included or even among the submissions themselves. For example, we received no articles that incorporated nonparametric or semi-parametric methods, such as various smoothing techniques. We also received no articles on the latest developments in clinical trials methodology, such as group sequential trials (Jennison & Turnbull, 2000). Surely such articles would be of interest to developmental psychologists evaluating interventions of one sort or another, especially when iatrogenic effects are possible (e.g., in a group therapy for conduct-disordered youth; Dishion, McCord, & Poulin, 1999).

We also were particularly disappointed that we received no applications of qualitative methodology. The original solicitation explicitly indicated that we would welcome such contributions. Other missing areas represent methods used in other areas of

psychology, such as taxometrics. Given the importance of distinguishing latent constructs from latent classes, such methods seem especially important. (This omission is surprising given that the American Psychological Association recently published a book on that very topic; Schmidt, Kotov, & Joiner, 2004.) Another theme we observed among the set of submissions is that developments in methodology can run the risk of being driven by a narrow range of software, notably Mplus (Muthén & Muthén, 1998, 2005). Perhaps this relationship is to be expected, and an economist would hardly fault a manufacturer for being responsive to consumer demands. Nonetheless, when an entire field relies on a single piece of software, the field becomes subject to needs and interests of the software developers. One problem is that most developmentalists do not work with software—like Stata (StataCorp, 2007) or R (R Development Core Team, 2007)—that can be easily extended to incorporate new methods.

This set of excellent articles nevertheless illustrates another theme: Psychologists need to know more about how these methods perform in real-world situations. We encouraged our authors to submit articles based on real data, not simulated data. Certainly such simulations are invaluable for assessing the statistical properties of estimators and estimation procedures, but analyses with a range of real data are important as well. Developmentalists analyzing data need a sense of whether more complex methods provide new insights or whether the findings based on traditional methods are robust. This need seems especially pressing in instances where the methods accomplish related ends (e.g., latent class analysis and configural frequency analysis). Researchers need to know the situations in which each method matches the research question and performs best.

Although we hope that these articles signal progress in the application of new methods to new questions in developmental psychology, a range of barriers slows progress. First and foremost are two issues of training. First, if our experience with finding reviewers is any indication, developmental psychology needs more methodologists. Any journal faces challenges in getting reviews, but the problems with obtaining reviews for this issue were especially formidable. We asked more than 200 scholars to review the 30 articles submitted for consideration. Many turned us down, indicating that they lacked the methodological expertise needed.

Second, and more problematic, is the methodological training nonmethodologists receive in developmental psychology. Most developmental psychology programs do not seem to recognize that statistics is a field of mathematics. On the basis of an informal survey of 20 graduate programs in developmental psychology, most developmental psychologists apparently take a course or two in statistics, but that course is often focused on applications rather than the underlying mathematical structure.

The result of this training is apparent in the submissions to the journal. Seldom do articles actually present the model in mathematical form; the submissions generally refer to this or that particular procedure by name. That level of detail probably was sufficient when the statistical procedures were fairly simple. When an article indicates that the analyses relied on a standard regression model with four covariates, readers generally know what was done. However, in complex models mixing latent classes with latent trajectories and nonlinear link functions, it is difficult or impossible to know what was actually done. For example, in these models, distributional assumptions or the choice of optimization

routines becomes critical; one would have to be very familiar with the software used to understand what was done. Further complicating matters are advances in statistical computing. Various estimation procedures are available for essentially the same model, and the choice of method often has implications for the properties of the resulting estimates.

Researchers who are not methodologists still need to know enough of the underlying statistical procedures to identify and interpret the key features of estimation. Available software makes a powerful array of statistical tools available; proper application depends on something more than pointing and clicking the right options

We believe that an important goal for the field is to bridge the chasm between the statistical methodologists in developmental psychology and developmentalists applying the methods they develop. Methodologists in psychology seem to be as well trained as specialists in other social sciences. In our experience, where developmental psychology lags behind other social sciences, notably economics, is in the statistical expertise of applied researchers. The training in economics generally involves two or three courses in mathematical statistics; furthermore, economics training builds on a foundation of mathematics that economists use in their theories. Although psychologists may eschew the mathematical theories (perhaps correctly), there is no doubt that the mathematical training gives economists a leg up in learning statistics. One might learn how to maximize a utility function to understand human behavior; the mathematics of maximizing a likelihood function is basically the same.

Another barrier to further methodological development in developmental psychology is the relatively limited culture of data sharing. If researchers developing methods are unable to assess a range of data sets, then understanding whether and how new methods can be applied is difficult. For example, the manual for one software package indicates that one can estimate multilevel models with data collected as part of complex sampling and that one can estimate those models in a flexible way (i.e., using adaptive quadrature; Hesketh-Rabe, Pickles, & Skrondal, 2001). Practical experience, however, indicates that generating parameter estimates can take literally weeks, making any assessment of the robustness of key model assumptions difficult or impossible. Methodologists are interested in determining whether and how their methods function in real world applications, but applied researchers need to share their data with them.

One explanation psychologists give for not sharing their data is that they spend too much time collecting it. Of course, one could argue that they collect too much data. (It is helpful to remember as well that the bulk of these data are collected with taxpayer money.) There are many large data sets that were competently collected and are well documented, representative of meaningful populations, and publicly available. Those data sets increasingly include developmentally appropriate measures. Those data sets represent a much sounder basis for further research in both theory and methods. New methods applied to unrepresentative or small samples are not especially useful, no matter how much effort went into data collection. No more useful are new insights gained from such data. Furthermore, the discourse that occurs between different researchers examining the same data set with different methods and different theories proves to be beneficial for the field as a whole. By not sharing or working from the same data sets, the field of

developmental psychology is denied a major avenue for advancement.

Our hope is that the articles presented here advance the natural development of methodology and conceptual research in developmental psychology and stimulate progress in overcoming these barriers.

References

- Bartholomew, D. J. (1987). *Latent variable models and factor analysis*. London: Oxford University Press.
- Curran, P., Hussong, A., Cai, L., Huang, W., Chassin, L., Sher, K., & Zucker, R. (2008). Pooling data from multiple longitudinal studies: The role of item response theory in integrative data analysis. *Developmental Psychology, 44*, ???-???
- Dishion, T. J., McCord, J., & Poulin, F. (1999). When interventions harm: Peer groups and problem behavior. *American Psychologist, 54*, 755-764.
- Durbin, J. (1970). Testing for serial correlation in least-squares regression when some of the regressors are lagged dependent variables. *Econometrica, 38*, 410-421.
- Elliott, D. S., Wilson, W. J., Huizinga, D., Sampson, R. J., Elliott, A., & Rankin, B. (1996). The effects of neighborhood disadvantage on adolescent development. *Journal of Research in Crime and Delinquency, 33*, 389.
- Flaherty, B. (2008). Testing the degree of cross-sectional and longitudinal dependence between two discrete dynamic processes. *Developmental Psychology, 44*, ???-???
- Furstenberg, F. F., Jr., Cook, T. D., Eccles, J. S., Elder, G. H., Jr., & Sameroff, A. (1999). *Managing to make it: Urban families and adolescent success*. Chicago: University of Chicago Press.
- Gennettian, L., Magnuson, K., & Morris, P. (2008). From statistical associations to causation: What developmentalists can learn from instrumental variables techniques coupled with experimental data. *Developmental Psychology, 44*, ???-???
- Glymour, M. M., Weuve, J., Berkman, L. F., Kawachi, I., & Robins, J. M. (2005). When is baseline adjustment useful in analyses of change? An example with education and cognitive change. *American Journal of Epidemiology, 162*, 267-278.
- Gruenewald, T., Mroczek, D., Ruff, C., & Singer, B. (2008). Diverse pathways to positive and negative affect in adulthood and later life: An integrative approach using recursive partitioning. *Developmental Psychology, 44*, ???-???
- Guryan, J., Jacob, B., Klopfer, E., & Groff, J. (2008). Using technology to explore social networks and mechanisms underlying peer effects in classrooms. *Developmental Psychology, 44*, ???-???
- Haviland, A., Nagin, D., Rosenbaum, P., & Tremblay, R. (2008). Combining group-based trajectory modeling and propensity score matching for causal inferences in nonexperimental longitudinal data. *Developmental Psychology, 44*, ???-???
- Hesketh-Rabe, S., Pickles, A., & Skrondal, A. (2001). *GLLAMM manual: Technical Report 2001/01*. London: Department of Biostatistics and Computing, University of London.
- Hong, G., & Yu, B. (2008). Effects of kindergarten retention on children's social-emotional development: An application of propensity score method to multivariate multilevel data. *Developmental Psychology, 44*, ???-???
- Jennison, C., & Turnbull, B. W. (2000). *Group sequential methods with applications to clinical trials*. Boca Raton, FL: CRC Press.
- Kaplan, D. (2008). An overview of Markov chain methods for the study of stage-sequential developmental processes. *Developmental Psychology, 44*, ???-???
- Lanza, S., & Collins, L. (2008). A new SAS procedure for latent transition

- analysis: Transitions in dating and sexual risk behavior. *Developmental Psychology*, 44, ???-???
- Mun, E. Y., von Eye, A., Bates, M., & Vaschillo, E. (2008). Finding groups using model-based cluster analysis: Heterogeneous emotional self-regulatory processes and heavy alcohol use risk. *Developmental Psychology*, 44, ???-???
- Muthén, L. K., & Muthén, B. O. (1998). *Mplus: The comprehensive modeling program for applied researchers*. Los Angeles: Author.
- Muthén, L. K., & Muthén, B. O. (2005). *Mplus: Statistical analysis with latent variables: User's guide*. Los Angeles: Author.
- Patterson, G. R. (1986). Performance models for antisocial boys. *American Psychologist*, 41, 432-444.
- Price, T., & Jaffee, S. (2008). Effects of family environment: Gene-environment interaction and passive gene-environment correlation. *Developmental Psychology*, 44, ???-???
- R Development Core Team. (2007). R: A language and environment for statistical computing [Computer software]. Vienna, Austria: R Foundation for Statistical Computing.
- Sampson, R. J., Raudenbush, S. W., & Earls, F. (1997, August 15). Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science*, 277, 918-924.
- Schmidt, N. B., Kotov, R., & Joiner, T. E. (2004). *Taxometrics: Toward a new diagnostic scheme for psychopathology*. Washington, DC: American Psychological Association.
- StataCorp. (2007). *Stata Statistical Software: Release 10.0* [Computer software]. College Station, TX: Stata Corporation.
- Stuart, E., & Green, K. (2008). Using full matching to estimate causal effects in nonexperimental studies: Examining the relationship between adolescent marijuana use and adult outcomes. *Developmental Psychology*, 44, ???-???
- Taylor, L. D., & Wilson, T. A. (1964). Three-pass least squares: A method for estimating models with a lagged dependent variable. *Review of Economics and Statistics*, 46, 329-346.
- von Eye, A., Mun, E. Y., & Bogat, G. A. (2008). Temporal patterns of variable relationships in person-oriented research: Longitudinal models of configural frequency analysis. *Developmental Psychology*, 44, ???-???
- Yoshikawa, H., Weisner, T., Kalil, A., & Way, N. (2008). Mixing qualitative and quantitative research methods in developmental science: Uses and methodological choices. *Developmental Psychology*, 44, ???-???

Received January 15, 2008

Revision received January 15, 2008

Accepted January 15, 2008 ■

AUTHOR QUERIES

AUTHOR PLEASE ANSWER ALL QUERIES

1

AQ1: Copyeditor: Delete semicolon?