PSY 607 STRUCTURE OF EXPERIENCE IN HUMAN DEVELOPMENT FALL 2014 SYLLABUS

Class meets TH 12-1:50 PM Franklin 271B

INSTRUCTOR
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COURSE OVERVIEW

What is the structure of early human experience and how do regularities in what babies see, hear and do matter for the developing system? Recent innovations in wearable technology (e.g., child-friendly head cameras and audio recorders) and analytics are making it possible to capture some basic statistical facts about the everyday experiences of young children. In this seminar, we will survey classic ideas about the role of the environment in human development as well as recent empirical discoveries about regularities in language and vision that are available to infants and toddlers. As we grapple with questions about how to capture and characterize the experienced structure, we will draw inspiration from psychology, linguistics, and computer science. Our larger goal will be to think together about how detailed measures of the way that experiences repeat, change and accrue over time provide mechanistic insight into how people build and use knowledge.

COURSE MATERIALS

All materials will be provided as PDF files on our Blackboard site.

INSTRUCTION PHILOSOPHY

This is a graduate-level seminar and you are all professional research psychologists. I expect you to treat this collegial seminar as you would any professional endeavor -- prepare, engage, and deliver. Throughout the course, you should be engaging with the material and using class meetings as opportunities to develop and refine your thinking with colleagues. Your efforts will help you build skills in critical reading, discussing, and implementing next steps in research that matters to you. I expect that you are excited to grapple with the content and plan to make the most of this opportunity to broaden and deepen your research expertise and skills. Welcome.

EXPECTATIONS & GRADING

Your job is to do the reading, prepare for and participate in class discussions, get involved in the material and hone your research design skills. If you are taking this course for one credit, your grade will be based on in-class participation. If you are taking this course for three credits, your grade will be based on in-class participation and writing a research proposal that matters to you.

Readings. Expect to dedicate considerable time outside of class to the readings -- it will be both demanding and rewarding. You are expected to complete the assigned readings before class and to take an active role in the class. Your best bet is to grapple with the issues presented in the readings before and during class.

Research proposal (applies only to students earning 3 credits). You will write a research proposal about a topic that matters to you. You will propose original research. The goal is for you to leave with a top-notch proposal that will be maximally useful to your graduate career. We will discuss specific guidelines and expectations together. Please talk to me early in the quarter to develop a plan.

Participation. As a professional research psychologist, you engage in intellectual discussion and debate with colleagues. This class will help you practice and improve these skills. You are expected to attend class and participate in class discussions. For each class, your participation (plus/minus) will be noted.

To earn an "A" for participation, you must earn a "plus" in at least 8 class sessions.
To earn a "Pass" for participation, you must earn a "plus" in at least 6 class sessions.

Your best bet is to attend every class and contribute to the discussions. On Blackboard, you will be able to see the "plus/minus" that you earn for each class. Please note that neither of the following things automatically earns you a "plus": showing up, opening your mouth. You must thoughtfully engage with the material. One strategy that will help you prepare to fully participate in discussions with your colleagues is to write down three questions based on the reading(s) that you'd like to discuss.

No. Plus earned (of 9 sessions)	participation grade	
8	A [100]	
7	B [89]	
6	C [79]	PASS
5	D [69]	
<5	F [50]	

FINAL LETTER GRADE
To earn 1 credit, your final letter grade will be your participation grade.

To earn 3 credits, your final letter grade will be:
In-class participation 85% ; Research proposal 15%

FAQ

What if I miss a class?
We have nine scheduled class meetings. You decide how to best earn the number of "plus" participation marks for the grade that you'd like. No questions asked.

If you have a professional scheduling conflict (e.g., a conference to attend) and you'd like to earn participation for the class session, tell Dr. Fausey at least one week in advance and you can agree on a written assignment. With the exception of extreme and unforeseen circumstances, contacting Dr. Fausey on the day of (or after) a missed class will be considered an unexcused absence and will result in no earned participation. Each class session is designed with you in mind. Your best strategy is to show up and reap the benefits.

What if I turn in an assignment late?
If you submit an assignment after its due date, your grade on the assignment will be reduced by 50%. This is true whether you submit your assignment 1, 2, 3, 4, or 5 days late. After 5 days, late work will no longer be accepted without some documented medical or family emergency. Your best strategy is to submit assignments on time.

Do you grade on a curve? Offer extra credit?
No, I do not grade on a curve. No, I do not offer extra credit. Your best strategy is to focus your energy on doing your best on all of your work.

ACADEMIC HONESTY

The short version: Don't cheat. Don't plagiarize. If you are unsure, please ask me.

As a member of the university community you are expected to be honest and forthright in all of your academic endeavors. To falsify the results of one's research, to present the words, ideas, data, or work of another as one's own, or to cheat on an examination corrupts the essential process by which knowledge is advanced.

All work submitted in this course must be your own and produced exclusively for this course. The use of sources (ideas, quotations, paraphrases) must be properly acknowledged and documented.

One form of academic misconduct is cheating. Among other definitions, it is considered cheating if you lie to Dr. Fausey about a class absence or absence/delay relating to an assignment.

Another form of academic misconduct is plagiarism, or using someone else's ideas and words without appropriate citation on a written assignment. Do not copy from Wikipedia, other students' papers, scholarly articles, websites, and a host of other sources. In this course, all submitted work will be checked by SafeAssign. Do not attempt plagiarism because you will be caught. Plagiarism is academic misconduct and cases of plagiarism will be treated as such.

Please note that it is mandatory for instructors to report suspected academic misconduct to the Office of Student Conduct. For the consequences of academic dishonesty, refer to the Schedule of Classes published quarterly. Violations will be taken seriously and are noted on student disciplinary records.

For more information regarding academic honesty and the student conduct code at the University of Oregon, visit the University's Office of Student Life website at: http://studentlife.uoregon.edu/StudentConductandCommunityStandards/StudentConductCode/tabid/69/Default.aspx

STATEMENT FOR STUDENTS WITH DISABILITIES

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring accommodation, please contact UO Accessible Education Center.

DISCLAIMER

This syllabus is an outline of the course and its policies, which may be changed for reasonable purposes during the semester at the instructor's discretion. You will be notified in class and/or via email if any changes are made to this syllabus and an updated syllabus will be provided on Blackboard.

Date	Description	Main Reading(s)	Related Readings(s)
Oct 2	**Group Discussion** What is structure? What kinds of structure(s) matter for what kinds of developmental change?		Marcus & Davis, 2014
Oct 9	**How does the environment matter for developmental change? Some classics.**	West & King, 1987 Gottlieb, 1991	Alberts, 2008 Elman, 1993 Elman et al., 1996 Fox, Levitt, & Nelson, 2010 Lord, 2012 Nelson, 2003 Nelson et al., 2007 Newport, 1990 Pinker & Prince, 1988 Smith, 2013 Turkewitz & Kenny, 1982
Oct 16	**Infants can learn from structure.**	Sequences Saffran et al., 1996 Fiser & Aslin, 2002 Cross-modal co-occurrence Smith & Yu, 2008 Vlach & Sandhofer, 2011 Distributions Casenhiser & Goldberg, 2005 Oakes & Spalding, 2007	Baldwin et al., 2001 Benitez & Smith, 2012 Gómez, 2002 Gómez & Gerken, 2000 Kirkham et al., 2002 Kuhl et al., 1992 Lew-Williams&Fernald,2007 Marcus et al., 1999 Maye et al., 2002 Mendoza & Baldwin, 2014 Romberg & Saffran, 2013 Samuelson et al., 2011 Scherf & Scott, 2012 Vlach et al., 2008 Werker et al., 1981 Xu & Garcia, 2008 *...and many more!*
Oct 23	**Structure captured from 3rd-person recordings.** **(broadly construed)**	Change over time (language) Hills, 2012 Hills et al., 2009 Roy, Frank, & Roy, 2009 Multimodal regularities Cartmill et al., 2013 Karasik et al., 2014 Roy, Frank, & Roy, 2012	Adolph et al., 2012 Beckage et al., 2011 Deák et al., 2014 Gogate et al., 2000 Hart & Risley, 1995 Hoff-Ginsburg, 1991 Huttenlocher et al., 2007 Iverson, 2010 Karasik et al., 2012 Kidd et al., 2012 Laakso & Smith, 2007 Lobo et al., 2014 Mintz, 2003 Monaghan et al., 2005 Vosoughi et al., 2010 Ullman et al., 2010 Wass & Smith, 2014 CHILDES bibliography

Date	Description	Main Reading(s)	Related Readings(s)
Oct 30	**Structure captured from 1st-person recordings in the lab.**	Franchak et al., 2011 Kretch et al., 2014 Smith, Yu, & Pereira, 2011 Yu & Smith, 2013	Fathin, Ren, & Regh, 2011 Foulsham et al., 2011 Frank et al., 2013 Pinto, Cox, & DiCarlo, 2008 Pirsiavash & Ramanan,2012 Pereira et al., 2010 Raudies et al., 2012 Yoshida & Smith, 2008 Yu & Smith, 2012 Yurovsky et al., 2013
Nov 6	**Structure captured from 1st-person recordings in the wild.**	Language & Motor Abney et al., 2014 Weisleder & Fernald, 2013 Vision Fausey et al. , submitted Jayaraman et al., submitted	Aslin, 2009 Braddick & Atkinson, 2011 Sugden et al., 2014
Nov 13	**How do we characterize the available structure?** **A multi-disciplinary challenge.** **Part 1: What do we count and why.**	***we will collectively decide which of these to make "Main Readings", based on student interests** Categories/Concepts Anderson & Schooler, 1991 Griffiths & Tenenbaum, 2006 Tenenbaum et al., 2011 Vision Geisler 2008 Greene, 2013 Simoncelli 2003 Ullman et al., 2012 Cutting et al., 2010 Wass & Smith, 2014 Non-human Blumberg et al., 2013 Blumberg et al., 2014 Takahashi et al., 2013 Physics Barabasi, 2005	Language Whorf, 1956 *...many more!* Neuroscience Bullmore & Sporns, 2009 Byrge et al., 2014 Hasson et al., 2012 Schapiro et al., 2013 Computer vision Lapedriza et al., 2013 *more TBA* Computer science Andrew Ng. TBA. Börner, 2011 Börner & Polley, 2014 *...and many more!*
Nov 20	**How do we characterize the available structure?** **A multi-disciplinary challenge.** **Part 2. The curious case of Zipf.**	Overview (language) Piantadosi 2014 Computer vision Salakhutdinov et al., 2011 Zhu et al., 2014 Matters for learning Casenhiser & Goldberg, 2005 Kurumada et al., 2013	Barsalou et al., 1998 Elio & Anderson, 1984 Navarro, 2013 Nosofsky, 1988 Oakes & Spalding, 1997

Date	Description	Main Reading(s)	Related Readings(s)
Dec 4	**So you want to design a study. . .** **Methodological & sampling issues in developmental "big data".**	Adolph & Robinson, 2011 Smith et al., in press Tomasello & Stahl 2004 *TBA: perhaps one more*	Zeanah et al., 2003 Databrary Wordbank CHILDES *TBA: Other databases (computer vision, network science)*
Dec 8	**Finals week -- No Class Meeting** **unless everyone votes to celebrate with a final session!**		

Reading List

Note: One quarter is far too little time to cover every relevant and interesting paper on this course topic! I have included additional references for students who may be interested in learning more.

We will add to this list throughout the quarter! Everyone should contribute. Bring related papers to class, email the group, get everyone thinking. By the end of the quarter, this list should be even more interesting!

***Papers that are assigned for "main readings" are in blue bold with a star.**

***Abney, D. H., Warlaumont, A. S., Haussman, A., Ross, J. M., & Wallot, S. (2014). Using nonlinear methods to quantify changes in infant limb movements and vocalizations. *Frontiers in psychology*, *5*.**

Adolph, K. E., Cole, W. G., Komati, M., Garciaguirre, J. S., Badaly, D., Lingeman, J. M., Chan, G. L. Y. , & Sotsky, R. B. (2012). How do you learn to walk? Thousands of steps and dozens of falls per day. *Psychological Science, 23*, 1387-1394.

***Adolph, K. E., & Robinson, S. R. (2011). Sampling development. "Tools of the Trade" section, *Journal of Cognition and Development, 12,* 411-423.**

Alberts, J. R. (2008). The nature of nurturant niches in ontogeny. *Philosophical Psychology*, *21*(3), 295-303.

***Anderson, J. R., & Schooler, L. J. (1991). Reflections of the environment in memory. *Psychological science*, *2*(6), 396-408.**

Aslin, R.N. (2009). How infants view natural scenes gathered from a head-mounted camera. *Optometry and vision science: official publication of the American Academy of Optometry, 86*(6), 561–565.

Baldwin, D. A., Baird, J. A., Saylor, M. M., & Clark, M. A. (2001). Infants parse dynamic action. *Child Development*, *72*(3), 708-717.

Barabasi, A. L. (2005). The origin of bursts and heavy tails in human dynamics. *Nature*, *435*(7039), 207-211.

Barsalou, L. W., Huttenlocher, J., & Lamberts, K. (1998). Basing categorization on individuals and events. *Cognitive Psychology*, *36*(3), 203-272.

Beckage, N., Smith, L., & Hills, T. (2011). Small worlds and semantic network growth in typical and late talkers. *PloS One*, *6*(5), e19348.

Benitez, V. L., & Smith, L. B. (2012). Predictable locations aid early object name learning. *Cognition*, *125*(3), 339-352.

Blumberg, M. S., Coleman, C. M., Gerth, A. I., & McMurray, B. Spatiotemporal structure of REM sleep twitching reveals developmental origins of motor synergies. *Current Biology,* 23, 2100-2109, 2013.

Blumberg, M. S., Gall, A. J., & Todd, W. D. The development of sleep–wake rhythms and the search for elemental circuits in the infant brain. *Behavioral Neuroscience,* 128, 2014.

Börner, Katy. 2011. "Network Science: Theory, Tools and Practice". In *William Sims Bainbridge, Ed. Leadership in Science and Technology: A Reference Handbook*. SAGE Publications, Inc.

Börner, Katy, and David E. Polley. 2014. *Visual Insights: A Practical Guide to Making Sense of Data*. Cambridge, MA: The MIT Press.

Braddick, O., & Atkinson, J. (2011). Development of human visual function. *Vision research*, *51*(13), 1588-1609.

Brent, M. R., & Siskind, J. M. (2001). The role of exposure to isolated words in early vocabulary development. *Cognition*, *81*(2), B33-B44.

Bullmore, E., & Sporns, O. (2009). Complex brain networks: graph theoretical analysis of structural and functional systems. *Nature Reviews Neuroscience*, *10*(3), 186-198.

Byrge, L., Sporns, O., & Smith, L. B. (2014). Developmental process emerges from extended brain–body–behavior networks. *Trends in cognitive sciences*.

***Cartmill, E. A., Armstrong, B. F., Gleitman, L. R., Goldin-Meadow, S., Medina, T. N., & Trueswell, J. C. (2013). Quality of early parent input predicts child vocabulary 3 years later. *Proceedings of the National Academy of Sciences*, *110*(28), 11278-11283.**

***Casenhiser, D., & Goldberg, A. E. (2005). Fast mapping between a phrasal form and meaning. *Developmental Science*, *8*(6), 500-508.**
Cutting, J. E., DeLong, J. E., & Nothelfer, C. E. (2010). Attention and the evolution of Hollywood film. *Psychological Science*.
Databrary. http://databrary.org/
Deák, G. O., Krasno, A. M., Triesch, J., Lewis, J., & Sepeta, L. (2014). Watch the hands: infants can learn to follow gaze by seeing adults manipulate objects. *Developmental Science*, *17*(2), 270-281.
Elio, R., & Anderson, J. R. (1984). The effects of information order and learning mode on schema abstraction. *Memory & cognition*, *12*(1), 20-30.
Elman, J. L. (1993). Learning and development in neural networks: The importance of starting small. *Cognition*, *48*(1), 71-99.
Elman, J. L., Bates, E. A., Johnson, M. H., Karmiloff-Smith, A., Parisi, D., & Plunkett, K. (1996). *Rethinking innateness*. Cambridge, MA: MIT Press.
Fathi, A., Ren, X., & Rehg, J. M. (2011, June). Learning to recognize objects in egocentric activities. In *Computer Vision and Pattern Recognition (CVPR), 2011 IEEE Conference On* (pp. 3281-3288). IEEE.
***Fausey, C.M., Jayaraman, S., & Smith, L.B. (submitted). From faces to hands: Changing visual input in the first two years.**
***Fiser, J., & Aslin, R. N. (2002). Statistical learning of new visual feature combinations by infants. *Proceedings of the National Academy of Sciences*, *99*(24), 15822-15826.**
Foulsham, T., Walker, E., & Kingstone, A. (2011). The where, what and when of gaze allocation in the lab and the natural environment. *Vision research*, *51*(17), 1920-1931.
Fox, S.E., Levitt, P., & Neslon III, C.A. (2010). How the timing and quality of early experiences influence the development of brain architecture. *Child development, 81*(1), 28-40.
***Franchak, J. M., Kretch, K. S., Soska, K. C., & Adolph, K. E. (2011). Head-mounted eye-tracking: A new method to describe infant looking. *Child Development, 82*(6), 1738-1750.**
Frank, M.C., Simmons, K., Yurovsky, D., & Pusiol, G. (2013). Developmental and postural changes in children's visual access to faces. *Proceedings of the 35th annual meeting of the Cognitive Science Society.*
Geisler, W. S. (2008). Visual perception and the statistical properties of natural scenes. *Annual Review of Psychology, 59*, 167-192.
Gogate, L. J., Bahrick, L. E., & Watson, J. D. (2000). A study of multimodal motherese: The role of temporal synchrony between verbal labels and gestures. *Child Development*, *71*(4), 878-894.
Gómez, R. L. (2002). Variability and detection of invariant structure. *Psychological Science*, *13*(5), 431-436.
Gómez, R. L., & Gerken, L. (2000). Infant artificial language learning and language acquisition. *Trends in cognitive sciences*, *4*(5), 178-186.
***Gottlieb, G. (1991). Experiential canalization of behavioral development: Theory. *Developmental Psychology, 27*(1), 4-13.**
Greene, M.R. (2013) Statistics of High-level Scene Context. *Frontiers in Perception Science,* 4, 777.
Griffiths, T. L., & Tenenbaum, J. B. (2006). Optimal predictions in everyday cognition. *Psychological Science*, *17*(9), 767-773.
Hart, B., & Risley, T. R. (1995). *Meaningful differences in the everyday experience of young American children*. Paul H Brookes Publishing.
Hasson, U., Ghazanfar, A. A., Galantucci, B., Garrod, S., & Keysers, C. (2012). Brain-to-brain coupling: a mechanism for creating and sharing a social world. *Trends in cognitive sciences*, *16*(2), 114-121.
***Hills, T. (2012). The company that words keep: Comparing the statistical structure of child versus adult-directed language. Journal of Child Language, available on CJO2012. doi:10.1017/S0305000912000165**
***Hills, T., Maouene, M., Maouene, J. & Sheya, A., & Smith L.B (2009). Longitudinal analysis of early semantic networks: Preferential attachment or preferential acquisition? *Psychological Science, 20(6),* 729-739.**
Hoff-Ginsberg, E. (1991). Mother-child conversation in different social classes and communicative settings. *Child development*, *62*(4), 782-796.
Huttenlocher, J., Vasilyeva, M., Waterfall, H. R., Vevea, J. L., & Hedges, L. V. (2007). The varieties of speech to young children. *Developmental psychology*, *43*(5), 1062.

Iverson, J.M. (2010). Developing language in a developing body: The relationship between motor development and language development. *Journal of Child Language, 37,* 229-261.

***Jayaraman, S., Fausey, C.M., & Smith, L.B. (submitted). The faces in infant-perspective scenes change over the first year of life.**

Karasik, L. B., Adolph, K. E., Tamis-LeMonda, C. S., & Zuckerman, A. L. (2012). Carry on: Spontaneous object carrying in 13-month-old crawling and walking infants. *Developmental Psychology, 48 (2),* 389-397.

***Karasik, L. B., Tamis-LeMonda, C. S., & Adolph, K. E. (2014). Crawling and walking infants elicit different verbal responses from mothers. *Developmental Science, 17*, 388-395.**

Kidd, C., Piantadosi, S. T., & Aslin, R. N. (2012). The Goldilocks effect: Human infants allocate attention to visual sequences that are neither too simple nor too complex. *PLoS One*, *7*(5), e36399.

Kirkham, N. Z., Slemmer, J. A., & Johnson, S. P. (2002). Visual statistical learning in infancy: Evidence for a domain general learning mechanism. *Cognition*, *83*(2), B35-B42.

***Kretch, K. S., Franchak, J. M., & Adolph, K. E. (2014). Crawling and walking infants see the world differently. *Child Development, 85*(4), 1503-1518.**

Kuhl, P. K., Williams, K. A., Lacerda, F., Stevens, K. N., & Lindblom, B. (1992). Linguistic experience alters phonetic perception in infants by 6 months of age. *Science*, *255*(5044), 606-608.

***Kurumada, C., Meylan, S. C., & Frank, M. C. (2013). Zipfian frequency distributions facilitate word segmentation in context. *Cognition*, *127*(3), 439-453.**

Laakso, A., & Smith, L. B. (2007). Pronouns and verbs in adult speech to children: A corpus analysis. *Journal of child language*, *34*(04), 725-763.

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Lew-Williams, C., & Fernald, A. (2007). Young children learning Spanish make rapid use of grammatical gender in spoken word recognition. *Psychological Science*, *18*(3), 193-198.

Lobo, M. A., Kokkoni, E., de Campos, A. C., & Galloway, J. C. (2014). Not just playing around: Infants' behaviors with objects reflect ability, constraints, and object properties. *Infant Behavior and Development*, *37*(3), 334-351.

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Lord, K. (2013). A comparison of the sensory development of wolves (Canis lupus lupus) and dogs (Canis lupus familiaris). *Ethology*, *119*(2), 110-120.

Marcus, G & Davis, E.. (2014). Eight (No, Nine!) problems with big data. New York Times. http://www.nytimes.com/2014/04/07/opinion/eight-no-nine-problems-with-big-data.html

Marcus, G. F., Vijayan, S., Rao, S. B., & Vishton, P. M. (1999). Rule learning by seven-month-old infants. *Science*, *283*(5398), 77-80.

Maye, J., Werker, J. F., & Gerken, L. (2002). Infant sensitivity to distributional information can affect phonetic discrimination. *Cognition*, *82*(3), B101-B111.

Mendoza, J. K., & Baldwin, D. (2014). Light on Infants' Discovery of Structure. *Advances in child development and behavior*, *46*, 113.

Mintz, T. H. (2003). Frequent frames as a cue for grammatical categories in child directed speech. *Cognition*, *90*(1), 91-117.

Monaghan, P., Chater, N., & Christiansen, M. H. (2005). The differential role of phonological and distributional cues in grammatical categorisation. *Cognition*, *96*(2), 143-182.

Navarro, D. J. (2013). Finding hidden types: Inductive inference in long-tailed environments. In *35th Annual Conf of the CogSci Soc* (pp. 1061-1066).

Nelson, C.A. (2003). The development of face recognition reflects an experience-expectant and activity-dependent process. In O. Pascalis & A. Slater (Eds.), *The development of face processing in infancy and early childhood: Current perspectives* (pp. 79-97). New York, NY: Nova Science Publishers.

Nelson, C. A., Zeanah, C. H., Fox, N. A., Marshall, P. J., Smyke, A. T., & Guthrie, D. (2007). Cognitive recovery in socially deprived young children: The Bucharest Early Intervention Project. *Science*, *318*(5858), 1937-1940.

Newport, E.L. (1990). Maturational constraints on language learning. *Cognitive Science, 14*(1), 11-28.

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Nosofsky, R. M. (1988). Similarity, frequency, and category representations. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *14*(1), 54.

***Oakes, L. M., & Spalding, T. L. (1997). The role of exemplar distribution in infants' differentiation of categories. *Infant Behavior and Development*, *20*(4), 457-475.**

Pereira, A.F., James, K.H., Jones, S.S., & Smith, L.B. (2010). Early biases and developmental changes in self-generated object views. *Journal of Vision, 10*(11), 1-13.

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Raudies, F., Gilmore, R. O., Kretch, K. S., Franchak, J. M., & Adolph, K. E. (2012, November). Understanding the development of motion processing by characterizing optic flow experienced by infants and their mothers. In *Development and Learning and Epigenetic Robotics (ICDL), 2012 IEEE International Conference on* (pp. 1-6). IEEE.

Romberg, A. R., & Saffran, J. R. (2013). All together now: Concurrent learning of multiple structures in an artificial language. *Cognitive science*, *37*(7), 1290-1320.

***Roy, B. C., Frank, M. C., & Roy, D. (2009). Exploring word learning in a high-density longitudinal corpus. *Proceedings of the 31st annual meeting of the Cognitive Science Society*.**

***Roy, B.C., Frank, M.C., & Roy, D. (2012). Relating activity contexts to early word learning in dense longitudinal data. *Proceedings of the 34th annual meeting of the Cognitive Science Society*.**

***Saffran, J. R., Aslin, R. N., & Newport, E. L. (1996). Statistical learning by 8-month-old infants. *Science*, *274*(5294), 1926-1928.**

***Salakhutdinov, R., Torralba, A., & Tenenbaum, J. (2011, June). Learning to share visual appearance for multiclass object detection. In *Computer Vision and Pattern Recognition (CVPR)* (pp. 1481-1488). IEEE.**

Samuelson, L. K., Smith, L. B., Perry, L. K., & Spencer, J. P. (2011). Grounding word learning in space. *PloS one*, *6*(12), e28095.

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Scherf, K. S., & Scott, L. S. (2012). Connecting developmental trajectories: Biases in face processing from infancy to adulthood. *Developmental psychobiology*, *54*(6), 643-663.

Simoncelli, E. P. (2003). Vision and the statistics of the visual environment. *Current Opinion in Neurobiology, 13*(2), 144–149.

Smith, L.B. (2013). It's all connected: Pathways in visual object recognition and early noun learning. *American Psychologist, 68*(8), 618-629.

***Smith, L. B. & Yu, C. (2008). Infants rapidly learn word-referent mappings via cross-situational statistics. *Cognition, 106(3),* 1558-1568.**

***Smith, L. B., Yu, C., & Pereira, A. F. (2011). Not your mother's view: The dynamics of toddler visual experience. *Developmental science, 14*(1), 9-17.**

***Smith, L.B., Yu, C., Yoshida, H., & Fausey, C.M. (in press). Contributions of head-mounted cameras to studying the visual environments of infants and young children. *Journal of Cognition and Development*.**

Sugden, N. A., Mohamed-Ali, M. I., & Moulson, M. C. (2014). I spy with my little eye: Typical, daily exposure to faces documented from a first-person infant perspective. *Developmental psychobiology*, *56*(2), 249-261.

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