

differences fit into this story. We can be reasonably confident that the child who is energetic and expressive and then becomes an adolescent who loves parties and excitement has a dopaminergic system that is more sensitive to cues of reward than the child (and adolescent) who is reserved and introverted. We can even say that the proneness of extraversion to be expressed in riskier behavior during adolescence than at other ages is due, at least in part, to the relatively late development of the PFC. However, we have no direct evidence regarding how changes in dopaminergic function might be linked to changes in personality in an extraverted child versus an introverted child. Providing this evidence, for extraversion and also for other traits, will require extensive additional research, and developmental personality neuroscience is the field that will carry it out.

## REFERENCES

- Abe, J. A. A. (2005). The predictive validity of the Five-Factor Model of personality with preschool age children: A nine year follow-up study. *Journal of Research in Personality*, 39(4), 423–442.
- Abe, J. A. A., & Izard, C. E. (1999). A longitudinal study of emotion expression and personality relations in early development. *Journal of Personality and Social Psychology*, 77(3), 566–577.
- Ahadi, S. A., & Rothbart, M. K. (1994). Temperament, development, and the Big Five. In C. F. Halverson, Jr., G. A. Kohnstamm, & R. P. Martin (Eds.), *The developing structure of temperament and personality from infancy to adulthood* (pp. 189–207). Hillsdale, NJ: Erlbaum.
- Allen, T. A., & DeYoung, C. G. (2017). Personality neuroscience and the five factor model. In T. A. Widiger (Ed.), *Oxford handbook of the five factor model* (pp. 319–352). New York: Oxford University Press.
- Allen, T. A., Rueter, A. R., Abram, S. V., Brown, J. S., & DeYoung, C. G. (2017). Personality and neural correlates of mentalizing ability. *European Journal of Personality*, 31(6), 599–613.
- Andrews-Hanna, J. R., Smallwood, J., & Spreng, R. N. (2014). The default network and self-generated thought: Component processes, dynamic control, and clinical relevance. *Annals of the New York Academy of Sciences*, 1316, 29–52.
- Bäckman, L., Lindenberger, U., Li, S. C., & Nyberg, L. (2010). Linking cognitive aging to alterations in dopamine neurotransmitter functioning: Recent data and future avenues. *Neuroscience and Biobehavioral Reviews*, 34(5), 670–677.
- Bar-Haim, Y., Fox, N. A., Benson, B., Guyer, A. E., Williams, A., Nelson, E. E., et al. (2009). Neural correlates of reward processing in adolescents with a history of inhibited temperament. *Psychological Science*, 20(8), 1009–1018.
- Baron-Cohen, S., & Wheelwright, S. (2004). The empathy quotient: An investigation of adults with Asperger syndrome or high functioning autism, and normal sex differences. *Journal of Autism and Developmental Disorders*, 34(2), 163–175.
- Beaty, R. E., Kaufman, S. B., Benedek, M., Jung, R. E., Kenett, Y. N., Jauk, E., et al. (2016). Personality and complex brain networks: The role of openness to experience in default network efficiency. *Human Brain Mapping*, 37(2), 773–779.
- Becht, A. I., Prinzie, P., Deković, M., Van den Akker, A. L., & Shiner, R. L. (2016). Child personality facets and overreactive parenting as predictors of aggression and rule-breaking trajectories from childhood to adolescence. *Development and Psychopathology*, 28(2), 399–413.
- Berridge, K. C., Robinson, T. E., & Aldridge, J. W. (2009). Dissecting components of reward: "Liking," "wanting," and learning. *Current Opinion in Pharmacology*, 9(1), 65–73.
- Bjørnebekk, A., Fjell, A. M., Walhovd, K. B., Grydeland, H., Torgersen, S., & Westlye, L. T. (2013). Neuronal correlates of the Five Factor Model (FFM) of human personality: Multimodal imaging in a large healthy sample. *NeuroImage*, 65, 194–208.
- Blackford, J. U., Allen, A. H., Cowan, R. L., & Avery, S. N. (2013). Amygdala and hippocampus fail to habituate to faces in individuals with an inhibited temperament. *Social Cognitive Affective Neuroscience*, 8(2), 143–150.
- Bradley, R., Binder, E., Epstein, M., Tang, Y., Nair, H., Liu, W., et al. (2008). Influence of child abuse on adult depression: Moderation by the corticotropin-releasing hormone receptor gene. *Archives of General Psychiatry*, 65(2), 190–200.
- Bress, J. N., & Hajcak, G. (2013). Self-report and behavioral measures of reward sensitivity predict the feedback negativity. *Psychophysiology*, 50(7), 610–616.
- Bridgett, D. J., Gartstein, M. A., Putnam, S. P., Lance, K. O., Iddins, E., Waits, R., et al. (2011). Emerging effortful control in toddlerhood: The role of infant orienting/regulation, maternal effortful control, and maternal time spent in caregiving activities. *Infant Behavior and Development*, 34(1), 189–199.
- Bromberg-Martin, E. S., Matsumoto, M., & Hikosaka, O. (2010). Dopamine in motivational control: Rewarding, aversive, and alerting. *Neuron*, 68(5), 815–834.
- Brown, S. M., Manuck, S. B., Flory, J. D., & Hariri, A. R. (2006). Neural basis of individual differences in impulsivity: Contributions of corticolimbic circuits for behavioral arousal and control. *Emotion*, 6(2), 239–245.
- Bunge, S. A. (2004). How we use rules to select actions: A review of evidence from cognitive neuroscience. *Cognitive, Affective, and Behavioral Neuroscience*, 4(4), 564–579.
- Bunge, S. A., & Zelazo, P. D. (2006). A brain-based

- account of the development of rule use in childhood. *Current Directions in Psychological Science*, 15(3), 118–121.
- Buss, K. A., Schumacher, J. R. M., Dolski, I., Kafin, N. H., Goldsmith, H. H., & Davidson, R. J. (2003). Right frontal brain activity, cortisol, and withdrawal behavior in 6-month-old infants. *Behavioral Neuroscience*, 117(1), 11–20.
- Calkins, S. D., Fox, N. A., & Marshall, T. R. (1996). Behavioral and physiological antecedents of inhibited and uninhibited behavior. *Child Development*, 67(2), 523–540.
- Carlson, S. M. (2005). Developmentally sensitive measures of executive function in preschool children. *Developmental Neuropsychology*, 28(2), 595–616.
- Casey, B. J. (2015). Beyond simple models of self-control to circuit-based accounts of adolescent behavior. *Annual Review of Psychology*, 66, 295–319.
- Caspi, A., & Shiner, R. L. (2006). Personality development. In W. Damon & R. Lerner (Series Eds.) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Vol. 3. Social, emotional, and personality development* (6th ed., pp. 300–365). New York: Wiley.
- Cheetham, A., Allen, N. B., Whittle, S., Simmons, J., Yücel, M., & Lubman, D. I. (2017). Orbitofrontal cortex volume and effortful control as prospective risk factors for substance use disorder in adolescence. *European Addiction Research*, 23(1), 37–44.
- Choi, Y. Y., Shamosh, N. A., Cho, S. H., DeYoung, C. G., Lee, M. J., Lee, J. M., et al. (2008). Multiple bases of human intelligence revealed by cortical thickness and neural activation. *Journal of Neuroscience*, 28(41), 10323–10329.
- Churchwell, J. C., & Yurgelun-Todd, D. A. (2013). Age-related changes in insula cortical thickness and impulsivity: Significance for emotional development and decision-making. *Developmental Cognitive Neuroscience*, 6, 80–86.
- Clauss, J. A., Seay, A. L., VanDerKlok, R. M., Avery, S., Cao, A., Cowan, R. L., et al. (2014). Structural and functional bases of inhibited temperament. *Social Cognitive and Affective Neuroscience*, 9(12), 2049–2058.
- Conklin, H. M., Luciana, M., Hooper, C. J., & Yarger, R. S. (2007). Working memory performance in typically developing children and adolescents: Behavioral evidence of protracted frontal lobe development. *Developmental Neuropsychology*, 31(1), 103–128.
- Conway, A. R., Kane, M. J., & Engle, R. W. (2003). Working memory capacity and its relation to general intelligence. *Trends in Cognitive Sciences*, 7(12), 547–552.
- Cooper, A. J., Duke, E., Pickering, A. D., & Smillie, L. D. (2014). Individual differences in reward prediction error: Contrasting relations between feedback-related negativity and trait measures of reward sensitivity, impulsivity and extraversion. *Frontiers in Human Neuroscience*, 8, 248.
- Côté, S., Vaillancourt, T., LeBlanc, J. C., Nagin, D. S., & Tremblay, R. E. (2006). The development of physical aggression from toddlerhood to pre-adolescence: A nation wide longitudinal study of Canadian children. *Journal of Abnormal Child Psychology*, 34(1), 68–82.
- Cremers, H., van Tol, M. J., Roelofs, K., Aleman, A., Zitman, F. G., van Buchem, M. A., et al. (2011). Extraversion is linked to volume of the orbitofrontal cortex and amygdala. *PLOS ONE*, 6(12), e28421.
- Cumberland-Li, A., Eisenberg, N., & Reiser, M. (2004). Relations of young children's agreeableness and resiliency to effortful control and impulsivity. *Social Development*, 13(2), 193–212.
- Darki, F., & Klingberg, T. (2015). The role of fronto-parietal and fronto-striatal networks in the development of working memory: A longitudinal study. *Cerebral Cortex*, 25, 1587–1595.
- Davey, C. G., Whittle, S., Harrison, B. J., Simmons, J. G., Byrne, M. L., Schwartz, O. S., et al. (2015). Functional brain-imaging correlates of negative affectivity and the onset of first-episode depression. *Psychological Medicine*, 45(5), 1001–1009.
- Davidov, M., Zahn-Waxler, C., Roth-Hanania, R., & Knafo, A. (2013). Concern for others in the first year of life: Theory, evidence, and avenues for research. *Child Development Perspectives*, 7(2), 126–131.
- Davidson, R. J. (1992). Emotion and affective style: Hemispheric substrates. *Psychological Science*, 3(1), 39–43.
- Davis, F. C., Knodt, A. R., Sporns, O., Lahey, B. B., Zald, D. H., Brigidi, B. D., et al. (2013). Impulsivity and the modular organization of resting-state neural networks. *Cerebral Cortex*, 23(6), 1444–1452.
- De Fruyt, F., Bartels, M., Van Leeuwen, K. G., De Clercq, B., Decuyper, M., & Mervielde, I. (2006). Five types of personality continuity in childhood and adolescence. *Journal of Personality and Social Psychology*, 91, 538–552.
- De Pauw, S. S., & Mervielde, I. (2010). Temperament, personality and developmental psychopathology: A review based on the conceptual dimensions underlying childhood traits. *Child Psychiatry and Human Development*, 41(3), 313–329.
- De Pauw, S. S., Mervielde, I., & Van Leeuwen, K. G. (2009). How are traits related to problem behavior in preschoolers?: Similarities and contrasts between temperament and personality. *Journal of Abnormal Child Psychology*, 37(3), 309–325.
- Denissen, J. J., & Penke, L. (2008). Motivational individual reaction norms underlying the Five-Factor model of personality: First steps towards a theory-based conceptual framework. *Journal of Research in Personality*, 42(5), 1285–1302.
- Dennison, M., Whittle, S., Yücel, M., Byrne, M. L., Schwartz, O., Simmons, J. G., et al. (2015). Trait positive affect is associated with hippocampal volume and change in caudate volume across adolescence. *Cognitive, Affective, and Behavioral Neuroscience*, 15(1), 80–94.

- Depue, R. A., & Collins, P. F. (1999). Neurobiology of the structure of personality: Dopamine, facilitation of incentive motivation, and extraversion. *Behavioral and Brain Sciences*, 22(3), 491–517.
- Depue, R. A., & Fu, Y. (2013). On the nature of extraversion: Variation in conditioned contextual activation of dopamine-facilitated affective, cognitive, and motor processes. *Frontiers in Human Neuroscience*, 7, 288.
- Depue, R. A., & Morrone-Strupinsky, J. V. (2005). A neurobehavioral model of affiliative bonding: Implications for conceptualizing a human trait of affiliation. *Behavioral and Brain Sciences*, 28(3), 313–349.
- DeYoung, C. G. (2006). Higher-order factors of the Big Five in a multi-informant sample. *Journal of Personality and Social Psychology*, 91(6), 1138–1151.
- DeYoung, C. G. (2013). The neuromodulator of exploration: A unifying theory of the role of dopamine in personality. *Frontiers in Human Neuroscience*, 7, 762.
- DeYoung, C. G. (2014). Openness/intellect: A dimension of personality reflecting cognitive exploration. In M. L. Cooper & R. J. Larsen (Eds.), *APA handbook of personality and social psychology: Vol. 4. Personality processes and individual differences* (pp. 369–399). Washington, DC: American Psychological Association.
- DeYoung, C. G. (2015). Cybernetic Big Five theory. *Journal of Research in Personality*, 56, 33–58.
- DeYoung, C. G., Cicchetti, D., & Rogosch, F. A. (2011). Moderation of the association between childhood maltreatment and neuroticism by the corticotropin-releasing hormone receptor 1 gene. *Journal of Child Psychology and Psychiatry*, 52(8), 898–906.
- DeYoung, C. G., Hirsh, J. B., Shane, M. S., Papademetris, X., Rajeevan, N., & Gray, J. R. (2010). Testing predictions from personality neuroscience: Brain structure and the Big Five. *Psychological Science*, 21(6), 820–828.
- DeYoung, C. G., Peterson, J. B., & Higgins, D. M. (2005). Sources of openness/intellect: Cognitive and neuropsychological correlates of the fifth factor of personality. *Journal of Personality*, 73(4), 825–858.
- DeYoung, C. G., Peterson, J. B., Séguin, J. R., & Tremblay, R. E. (2008). Externalizing behavior and the higher order factors of the Big Five. *Journal of Abnormal Psychology*, 117(4), 947–953.
- DeYoung, C. G., Quilty, L. C., & Peterson, J. B. (2007). Between facets and domains: 10 aspects of the Big Five. *Journal of Personality and Social Psychology*, 93(5), 880–896.
- DeYoung, C. G., Quilty, L. C., Peterson, J. B., & Gray, J. R. (2014). Openness to experience, intellect, and cognitive ability. *Journal of Personality Assessment*, 96(1), 46–52.
- DeYoung, C. G., & Rueter, A. R. (2016). Impulsivity as a personality trait. In K. D. Vohs & R. F. Baumeister (Eds.), *Handbook of self-regulation: Research, theory, and applications* (3rd ed., pp. 345–363). New York: Guilford Press.
- DeYoung, C. G., Shamosh, N. A., Green, A. E., Braver, T. S., & Gray, J. R. (2009). Intellect as distinct from openness: Differences revealed by fMRI of working memory. *Journal of Personality and Social Psychology*, 97(5), 883–892.
- DeYoung, C. G., Weisberg, Y. J., Quilty, L. C., & Peterson, J. B. (2013). Unifying the aspects of the Big Five, the interpersonal circumplex, and trait affiliation. *Journal of Personality*, 81(5), 465–475.
- Digman, J. M. (1997). Higher-order factors of the Big Five. *Journal of Personality and Social Psychology*, 73(6), 1246–1256.
- Digman, J. M., & Shmelyov, A. G. (1996). The structure of temperament and personality in Russian children. *Journal of Personality and Social Psychology*, 71(2), 341–351.
- DiPietro, J. A., Hodgson, D. M., Costigan, K. A., & Johnson, T. R. (1996). Fetal antecedents of infant temperament. *Child Development*, 67(5), 2568–2583.
- Dougherty, L. R., Smith, V. C., Olino, T. M., Dyson, M. W., Bufford, S. J., Rose, S. A., et al. (2013). Maternal psychopathology and early child temperament predict young children's salivary cortisol 3 years later. *Journal of Abnormal Child Psychology*, 41(4), 531–542.
- Dumontelle, I., Apperly, I. A., & Blakemore, S. J. (2010). Online usage of theory of mind continues to develop in late adolescence. *Developmental Science*, 13(2), 331–338.
- Durbin, C. E., Hayden, E. P., Klein, D. N., & Olino, T. M. (2007). Stability of laboratory-assessed temperamental emotionality traits from ages 3 to 7. *Emotion*, 7(2), 388–389.
- Dyson, M. W., Olino, T. M., Durbin, C. E., Goldsmith, H. H., Bufford, S. J., Miller, A. R., et al. (2015). The structural and rank-order stability of temperament in young children based on a laboratory-observational measure. *Psychological Assessment*, 27(4), 1388–1401.
- Eaton, W. O., & Saudino, K. J. (1992). Prenatal activity level as a temperament dimension?: Individual differences and developmental functions in fetal movement. *Infant Behavior and Development*, 15(1), 57–70.
- Erixon-Lindroth, N., Farde, L., Wahlin, T. B. R., Sovago, J., Halldin, C., & Bäckman, L. (2005). The role of the striatal dopamine transporter in cognitive aging. *Psychiatry Research: Neuroimaging*, 138(1), 1–12.
- Etkin, A., Egner, T., & Kalisch, R. (2011). Emotional processing in anterior cingulate and medial prefrontal cortex. *Trends in Cognitive Sciences*, 15(2), 85–93.
- Evans, B. E., Stam, J., Huizink, A. C., Willemen, A. M., Westenberg, P. M., Branje, S., et al. (2016). Neuroticism and extraversion in relation to physiological stress reactivity during adolescence. *Biological Psychology*, 117, 67–79.
- Evans, D. E., & Rothbart, M. K. (2007). Developing a model for adult temperament. *Journal of Research in Personality*, 41(4), 868–888.

- Everaerd, D., Klumpers, F., van Wingen, G., Tendolkar, I., & Fernández, G. (2015). Association between neuroticism and amygdala responsivity emerges under stressful conditions. *NeuroImage*, 112, 218–224.
- Everhart, D. E., Demaree, H. A., & Harrison, D. W. (2008). The influence of hostility on electroencephalographic activity and memory functioning during an affective memory task. *Clinical Neurophysiology*, 119(1), 134–143.
- Fair, D. A., Cohen, A. L., Power, J. D., Dosenbach, N. U., Church, J. A., Miezin, F. M., et al. (2009). Functional brain networks develop from a “local to distributed” organization. *PLOS Computational Biology*, 5(5), e1000381.
- Farr, O. M., Hu, S., Zhang, S., & Li, C. S. R. (2012). Decreased saliency processing as a neural measure of Barratt impulsivity in healthy adults. *NeuroImage*, 63(3), 1070–1077.
- Fekete, T., Beacher, F. D., Cha, J., Rubin, D., & Mujica-Parodi, L. R. (2014). Small-world network properties in prefrontal cortex correlate with predictors of psychopathology risk in young children: A fNIRS study. *NeuroImage*, 85, 345–353.
- Finn, A. S., Sheridan, M. A., Kam, C. L. H., Hinshaw, S., & D’Esposito, M. (2010). Longitudinal evidence for functional specialization of the neural circuit supporting working memory in the human brain. *Journal of Neuroscience*, 30(33), 11062–11067.
- Forbes, C. E., Poore, J. C., Krueger, F., Barbey, A. K., Solomon, J., & Grafman, J. (2014). The role of executive function and the dorsolateral prefrontal cortex in the expression of neuroticism and conscientiousness. *Social Neuroscience*, 9(2), 139–151.
- Fox, M. D., Corbetta, M., Snyder, A. Z., Vincent, J. L., & Raichle, M. E. (2006). Spontaneous neuronal activity distinguishes human dorsal and ventral attention systems. *Proceedings of the National Academy of Sciences of the USA*, 103(26), 10046–10051.
- Fox, N. A. (1991). If it’s not left, it’s right: Electroencephalograph asymmetry and the development of emotion. *American Psychologist*, 46(8), 863–872.
- Fox, N. A., Calkins, S. D., & Bell, M. A. (1994). Neural plasticity and development in the first two years of life: Evidence from cognitive and socioemotional domains of research. *Development and Psychopathology*, 6(4), 677–696.
- Fox, N. A., Henderson, H. A., Marshall, P. J., Nichols, K. E., & Ghera, M. M. (2005). Behavioral inhibition: Linking biology and behavior within a developmental framework. *Annual Review of Psychology*, 56, 235–262.
- Fox, N. A., Henderson, H. A., Rubin, K. H., Calkins, S. D., & Schmidt, L. A. (2001). Continuity and discontinuity of behavioral inhibition and exuberance: Psychophysiological and behavioral influences across the first four years of life. *Child Development*, 72(1), 1–21.
- Garcia-Banda, G., Chellew, K., Fornes, J., Perez, G., Servera, M., & Evans, P. (2014). Neuroticism and cortisol: Pinning down an expected effect. *International Journal of Psychophysiology*, 91(2), 132–138.
- Garcia-Coll, C., Kagan, J., & Reznick, J. S. (1984). Behavioral inhibition in young children. *Child Development*, 55(3), 1005–1019.
- Gartstein, M. A., & Rothbart, M. K. (2003). Studying infant temperament via the revised infant behavior questionnaire. *Infant Behavior and Development*, 26(1), 64–86.
- Gartstein, M. A., Slobodskaya, H. R., Putnam, S. P., & Kinsht, I. A. (2009). A cross-cultural study of infant temperament: Predicting preschool effortful control in the United States of America and Russia. *European Journal of Developmental Psychology*, 6(3), 337–364.
- Gerritsen, L., Geerlings, M., Bremmer, M., Beekman, A., Deeg, D., Penninx, B. W. J. H., et al. (2009). Personality characteristics and hypothalamic–pituitary–adrenal axis regulation in older persons. *American Journal of Geriatric Psychiatry*, 17(12), 1077–1084.
- Giedd, J. N., Blumenthal, J., Jeffries, N. O., Castellanos, F. X., Liu, H., Zijdenbos, A., et al. (1999). Brain development during childhood and adolescence: A longitudinal MRI study. *Nature Neuroscience*, 2(10), 861–863.
- Gjerde, P. F., & Cardilla, K. (2009). Developmental implications of openness to experience in preschool children: Gender differences in young adulthood. *Developmental Psychology*, 45(5), 1455–1464.
- Glynn, L. M., Davis, E. P., Schetter, C. D., Chicz-DeMet, A., Hobel, C. J., & Sandman, C. A. (2007). Postnatal maternal cortisol levels predict temperament in healthy breastfed infants. *Early Human Development*, 83(10), 675–681.
- Grabe, H., Schwahn, C., Appel, K., Mahler, J., Schulz, A., Spitzer, C., et al. (2010). Childhood maltreatment, the corticotropin-releasing hormone receptor gene and adult depression in the general population. *American Journal of Medical Genetics B: Neuropsychiatric Genetics*, 153(8), 1483–1493.
- Gray, J. A., & McNaughton, N. (2000). *The neuropsychology of anxiety: An enquiry into the function of the septo-hippocampal system*. New York: Oxford University Press.
- Graziano, W. G., & Tobin, R. M. (2013). The cognitive and motivational foundations underlying Agreeableness. In M. D. Robinson, E. R. Watkins, & E. Harmon-Jones (Eds.), *Handbook of cognition and emotion* (pp. 347–364). New York: Guilford Press.
- Greenough, W. T., Black, J. E., & Wallace, C. S. (1987). Experience and brain development. *Child Development*, 58(3), 539–559.
- Grey, K. R., Davis, E. P., Sandman, C. A., & Glynn, L. M. (2013). Human milk cortisol is associated with infant temperament. *Psychoneuroendocrinology*, 38(7), 1178–1185.
- Grodin, E. N., & White, T. L. (2015). The neuroanatomical delineation of agentic and affiliative extra-

- version. *Cognitive, Affective, and Behavioral Neuroscience*, 15(2), 321–334.
- Guyer, A. E., Nelson, E. E., Pérez-Edgar, K., Hardin, M. G., Roberson-Nay, R., Monk, C. S., et al. (2006). Striatal functional alteration in adolescents characterized by early childhood behavioral inhibition. *Journal of Neuroscience*, 26(24), 6399–6405.
- Hagekull, B., & Bohlin, G. (2003). Early temperament and attachment as predictors of the Five Factor Model of personality. *Attachment and Human Development*, 5(1), 2–18.
- Halverson, C. F., Havill, V. L., Deal, J., Baker, S. R., Victor, J. B., Pavlopoulos, V., et al. (2003). Personality structure as derived from parental ratings of free descriptions of children: The Inventory of Child Individual Differences. *Journal of Personality*, 71(6), 995–1026.
- Hane, A. A., Fox, N. A., Henderson, H. A., & Marshall, P. J. (2008). Behavioral reactivity and approach-withdrawal bias in infancy. *Developmental Psychology*, 44(5), 1491–1496.
- Harmon-Jones, E. (2004). Contributions from research on anger and cognitive dissonance to understanding the motivational functions of asymmetrical frontal brain activity. *Biological Psychology*, 67(1–2), 51–76.
- Harmon-Jones, E., & Allen, J. J. B. (1998). Anger and frontal brain activity: EEG asymmetry consistent with approach motivation despite negative affective valence. *Journal of Personality and Social Psychology*, 74(5), 1310–1316.
- Herzhoff, K., & Tackett, J. L. (2012). Establishing construct validity for Openness-to-Experience in middle childhood: Contributions from personality and temperament. *Journal of Research in Personality*, 46(3), 286–294.
- Holmes, A. J., Lee, P. H., Hollinshead, M. O., Bakst, L., Roffman, J. L., Smoller, J. W., et al. (2012). Individual differences in amygdala-medial prefrontal anatomy link negative affect, impaired social functioning, and polygenic depression risk. *Journal of Neuroscience*, 32, 18087–18100.
- Hou, X., Allen, T. A., Wei, D., Huang, H., Wang, K., DeYoung, C. G., et al. (2017). Trait compassion is associated with the neural substrate of empathy. *Cognitive, Affective, and Behavioral Neuroscience*, 17(5), 1018–1027.
- Imuta, K., Henry, J. D., Slaughter, V., Selcuk, B., & Ruffman, T. (2016). Theory of mind and prosocial behavior in childhood: A meta-analytic review. *Developmental Psychology*, 52(8), 1192–1205.
- Inder, T. E., & Huppi, P. S. (2000). In vivo studies of brain development by magnetic resonance techniques. *Developmental Disabilities Research Reviews*, 6(1), 59–67.
- Jackson, J., Balota, D. A., & Head, D. (2011). Exploring the relationship between personality and regional brain volume in healthy aging. *Neurobiology of Aging*, 32(12), 2162–2171.
- Jensen-Campbell, L. A., Rosselli, M., Workman, K. A., Santisi, M., Rios, J. D., & Bojan, D. (2002). Agreeableness, conscientiousness, and effortful control processes. *Journal of Research in Personality*, 36(5), 476–489.
- John, O. P., Caspi, A., Robins, R. W., Moffitt, T. E., & Stouthamer-Loeber, M. (1994). The "Little Five": Exploring the five-factor model of personality in adolescent boys. *Child Development*, 65, 160–178.
- Jung, R. E., & Haier, R. J. (2007). The Parieto-Frontal Integration Theory (P-FIT) of intelligence: Converging neuroimaging evidence. *Behavioral and Brain Sciences*, 30(2), 135–154.
- Kagan, J., Reznick, J. S., & Snidman, N. (1987). The physiology and psychology of behavioral inhibition in children. *Child Development*, 58(6), 1459–1473.
- Kagan, J., Reznick, J. S., Snidman, N., Gibbons, J., & Johnson, M. O. (1988). Childhood derivatives of inhibition and lack of inhibition to the unfamiliar. *Child Development*, 59(6), 1580–1589.
- Kapogiannis, D., Sutin, A., Davatzikos, C., Costa, P., & Resnick, S. (2013). The five factors of personality and regional cortical variability in the Baltimore longitudinal study of aging. *Human Brain Mapping*, 34(11), 2829–2840.
- Kern, M. L., Duckworth, A. L., Urzúa, S. S., Loeber, R., Stouthamer-Loeber, M., & Lynam, D. R. (2013). Do as you're told!: Facets of agreeableness and early adult outcomes for inner-city boys. *Journal of Research in Personality*, 47(6), 795–799.
- Klimstra, T. A., Bleidorn, W., Asendorpf, J. B., Van Aken, M. A., & Denissen, J. J. (2013). Correlated change of Big Five personality traits across the lifespan: A search for determinants. *Journal of Research in Personality*, 47(6), 768–777.
- Klingberg, T. (2006). Development of a superior frontal-intraparietal network for visuo-spatial working memory. *Neuropsychologia*, 44(11), 2171–2177.
- Kochanska, G., & Knaack, A. (2003). Effortful control as a personality characteristic of young children: Antecedents, correlates, and consequences. *Journal of Personality*, 71(6), 1087–
- Kochanska, G., Murray, K. T., & Harlan, E. T. (2000). Effortful control in early childhood: Continuity and change, antecedents, and implications for social development. *Developmental Psychology*, 36(2), 220–232.
- Kranzler, H. R., Feinn, R., Nelson, E. C., Covault, J., Anton, R. F., Farrer, L., et al. (2011). A CRHR1 haplotype moderates the effect of adverse childhood experiences on lifetime risk of major depressive episode in African-American women. *American Journal of Medical Genetics B: Neuropsychiatric Genetics*, 156(8), 960–968.
- Krueger, R. F., & Johnson, W. (2008). Behavioral genetics and personality: A new look at the integration of nature and nurture. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (3rd ed., pp. 387–287). New York: Guilford Press.
- Kujawa, A., Proudfoot, G. H., Kessel, E. M., Dyson, M., Olino, T., & Klein, D. N. (2015). Neural reactivity

- to monetary rewards and losses in childhood: Longitudinal and concurrent associations with observed and self-reported positive emotionality. *Biological Psychology*, 104, 41–47.
- Lahat, A., Benson, B., Pine, D. S., Fox, N. A., & Ernst, M. (2018). Neural responses to reward in childhood: Relations to early behavioral inhibition and social anxiety. *Social Cognitive and Affective Neuroscience*, 13(3), 281–289.
- Lange, S., Leue, A., & Beauducel, A. (2012). Behavioral approach and reward processing: Results on feedback-related negativity and P3 component. *Biological Psychology*, 89(2), 416–425.
- Lenroot, R. K., & Giedd, J. N. (2006). Brain development in children and adolescents: Insights from anatomical magnetic resonance imaging. *Neuroscience and Biobehavioral Reviews*, 30(6), 718–729.
- Lewis, G. J., Panizzon, M. S., Eyler, L., Fennema-Notestine, C., Chen, C. H., Neale, M. C., et al. (2014). Heritable influences on amygdala and orbitofrontal cortex contribute to genetic variation in core dimensions of personality. *NeuroImage*, 103, 309–315.
- Lewis, M. (2000). The emergence of human emotions. In M. Lewis & J. Haviland (Eds.), *Handbook of emotions* (pp. 265–280). New York: Guilford Press.
- Liu, W.-Y., Weber, B., Reuter, M., Markett, S., Chu, W.-C., & Montag, C. (2013). The Big Five of personality and structural imaging revisited: A VBM-DARTEL study. *NeuroReport*, 24(7), 375–380.
- Mackrell, S. V., Sheikh, H. I., Kotelnikova, Y., Kryski, K. R., Jordan, P. L., Singh, S. M., et al. (2014). Child temperament and parental depression predict cortisol reactivity to stress in middle childhood. *Journal of Abnormal Psychology*, 123(1), 106–116.
- Matsuo, K., Nicoletti, M., Nemoto, K., Hatch, J. P., Peluso, M. A., Nery, F. G., et al. (2009). A voxel-based morphometry study of frontal gray matter correlates of impulsivity. *Human Brain Mapping*, 30(4), 1188–1195.
- McAdams, D. P., & Pals, J. L. (2006). A new Big Five: Fundamental principles for an integrative science of personality. *American Psychologist*, 61(3), 204–217.
- Mervielde, I., Buyst, V., & De Fruyt, F. (1995). The validity of the Big-Five as a model for teachers' ratings of individual differences among children aged 4–12 years. *Personality and Individual Differences*, 18(4), 525–534.
- Mervielde, I., De Clercq, B., De Fruyt, F., & Van Leeuwen, K. (2005). Temperament, personality, and developmental psychopathology as childhood antecedents of personality disorders. *Journal of Personality Disorders*, 19(2), 171–201.
- Mervielde, I., & De Fruyt, F. (2000). The Big Five personality factors as a model for the structure of children's peer nominations. *European Journal of Personality*, 14(2), 91–106.
- Miller, G., Cohen, S., Rabin, B., Skoner, D. P., & Doyle, W. J. (1999). Personality and tonic cardiovascular, neuroendocrine, and immune parameters. *Brain, Behavior, and Immunity*, 13(2), 109–123.
- Miller, K. G., Wright, A. G., Peterson, L. M., Kamark, T. W., Anderson, B. A., Kirschbaum, C., et al. (2016). Trait positive and negative emotionality differentially associate with diurnal cortisol activity. *Psychoneuroendocrinology*, 68, 177–185.
- Mills, K. L., Lalonde, F., Clasen, L. S., Giedd, J. N., & Blakemore, S. J. (2014). Developmental changes in the structure of the social brain in late childhood and adolescence. *Social Cognitive and Affective Neuroscience*, 9(1), 123–131.
- Montoya, E. R., Terburg, D., Bos, P. A., & Van Honk, J. (2012). Testosterone, cortisol, and serotonin as key regulators of social aggression: A review and theoretical perspective. *Motivation and Emotion*, 36(1), 65–73.
- Morinaga, K., Akiyoshi, J., Matsushita, H., Ichioka, S., Tanaka, Y., Tsuru, J., et al. (2007). Anticipatory anxiety-induced changes in human lateral prefrontal cortex activity. *Biological Psychology*, 74(1), 34–38.
- Möttus, R., Johnson, W., & Deary, I. J. (2012). Personality traits in old age: Measurement and rank-order stability and some mean-level change. *Psychology and Aging*, 27(1), 243–249.
- Mueller, E. M., Burgdorf, C., Chavanon, M. L., Schweiger, D., Wacker, J., & Stemmler, G. (2014). Dopamine modulates frontomedial failure processing of agentic introverts versus extraverts in incentive contexts. *Cognitive, Affective, and Behavioral Neuroscience*, 14(2), 756–768.
- Mujica-Parodi, L. R., Korgaonkar, M., Ravindranath, B., Greenberg, T., Tomasi, D., Wagshul, M., et al. (2009). Limbic dysregulation is associated with lowered heart rate variability and increased trait in healthy adults. *Human Brain Mapping*, 30(1), 47–58.
- Muris, P., Bos, A. E., Mayer, B., Verkade, R., Thewissen, V., & Dell'Avvento, V. (2009). Relations among behavioral inhibition, Big Five personality factors, and anxiety disorder symptoms in non-clinical children. *Personality and Individual Differences*, 46(4), 525–529.
- Naragon-Gainey, K., Watson, D., & Markon, K. E. (2009). Differential relations of depression and social anxiety symptoms to the facets of extraversion/positive emotionality. *Journal of Abnormal Psychology*, 118(2), 299–310.
- Nater, U. M., Hopmann, C., & Klumb, P. L. (2010). Neuroticism and conscientiousness are associated with cortisol diurnal profiles in adults—role of positive and negative affect. *Psychoneuroendocrinology*, 35(10), 1573–1577.
- Nettle, D. (2006). The evolution of personality variation in humans and other animals. *American Psychologist*, 61(6), 622–631.
- Nettle, D. (2007). *Personality: What makes you the way you are*. New York: Oxford University Press.
- Nettle, D., & Liddle, B. (2008). Agreeableness is related to social-cognitive, but not social-perceptual, theory

- of mind. *European Journal of Personality*, 22(4), 323–335.
- Nguyen, T. V., McCracken, J. T., Albaugh, M. D., Botteron, K. N., Hudziak, J. J., & Ducharme, S. (2016). A testosterone-related structural brain phenotype predicts aggressive behavior from childhood to adulthood. *Psychoneuroendocrinology*, 63, 109–118.
- Nouchi, R., Takeuchi, H., Taki, Y., Sekiguchi, A., Kotokazi, Y., Nakagawa, S., et al. (2016). Neuroanatomical bases of effortful control: Evidence from a large sample of young healthy adults using voxel-based morphometry. *Scientific Reports*, 6, Article No. 31231.
- Passamonti, L., Terracciano, A., Riccelli, R., Donzuso, G., Cerasa, A., Vaccaro, M. G., et al. (2015). Increased functional connectivity within mesocortical networks in open people. *NeuroImage*, 104, 301–309.
- Pérez-Edgar, K., Roberson-Nay, R., Hardin, M. G., Poeth, K., Guyer, A. E., Nelson, E. E., et al. (2007). Attention alters neural responses to evocative faces in behaviorally inhibited adolescents. *NeuroImage*, 35(4), 1538–1546.
- Polanczyk, G., Caspi, A., Williams, B., Price, T. S., Danese, A., Sugden, K., et al. (2009). Protective effect of CRHR1 gene variants on the development of adult depression following childhood maltreatment: Replication and extension. *Archives of General Psychiatry*, 66(9), 978–985.
- Polk, D., Cohen, S., Doyle, W., Skoner, D. P., & Kirschbaum, C. (2005). State and trait affect as predictors of salivary cortisol in healthy adults. *Psychoneuroendocrinology*, 30(3), 261–272.
- Posner, M. I., & Fan, J. (2008). Attention as an organ system. In J. R. Pomerantz (Ed.), *Topics in integrative neuroscience* (pp. 31–61). New York: Cambridge University Press.
- Posner, M. I., & Rothbart, M. K. (1998). Attention, self-regulation, and consciousness. *Philosophical Transactions of the Royal Society of London B*, 353, 1915–1927.
- Posner, M. I., & Rothbart, M. K. (2007). Research on attention networks as a model for the integration of psychological science. *Annual Review of Psychology*, 58, 1–23.
- Premack, D., & Woodruff, G. (1978). Does the chimpanzee have a theory of mind? *Behavioral and Brain Sciences*, 1(4), 515–526.
- Proudfoot, G. H. (2015). The reward positivity: From basic research on reward to a biomarker for depression. *Psychophysiology*, 52(4), 449–459.
- Putnam, S. P., Rothbart, M. K., & Gartstein, M. A. (2008). Homotypic and heterotypic continuity of fine-grained temperament during infancy, toddlerhood, and early childhood. *Infant and Child Development*, 17(4), 387–405.
- Quilty, L. C., DeYoung, C. G., Oakman, J. M., & Bagby, R. M. (2014). Extraversion and behavioral activation: Integrating the components of approach. *Journal of Personality Assessment*, 96(1), 87–94.
- Raine, A., Reynolds, C., Venables, P. H., & Mednick, S. A. (2002). Stimulation seeking and intelligence: A prospective longitudinal study. *Journal of Personality and Social Psychology*, 82(4), 663–674.
- Reardon, K. W., Herzoff, K., & Tackett, J. L. (2015). Adolescent personality as risk and resiliency in the testosterone–externalizing association. *Journal of Research on Adolescence*, 26(3), 390–402.
- Roberts, B. W., & DelVecchio, W. F. (2000). The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies. *Psychological Bulletin*, 126(1), 3–25.
- Roberts, B. W., Walton, K. E., & Viechtbauer, W. (2006). Patterns of mean-level change in personality traits across the life course: A meta-analysis of longitudinal studies. *Psychological Bulletin*, 132(1), 1–25.
- Rothbart, M. K. (2007). Temperament, development, and personality. *Current Directions in Psychological Science*, 16(4), 207–212.
- Rothbart, M. K., & Bates, J. E. (1998). Temperament. In W. Damon (Series Ed.) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Vol. 3. Social, emotional, and personality development* (5th ed., pp. 105–176). New York: Wiley.
- Rothbart, M. K., & Bates, J. E. (2006). Temperament. In W. Damon & R. Lerner (Series Eds.) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Vol. 3. Social, emotional, and personality development* (6th ed., pp. 99–166). New York: Wiley.
- Rothbart, M. K., & Derryberry, D. (1981). Development of individual differences in temperament. In M. E. Lamb & A. L. Brown (Eds.), *Advances in developmental psychology* (Vol. 1, pp. 37–86). Hillsdale, NJ: Erlbaum.
- Rothbart, M. K., & Derryberry, D., & Hershey, K. (2000). Stability of temperament in childhood: Laboratory infant assessment to parent report at seven years. In V. J. Molfese & D. L. Molfese (Eds.), *Temperament and personality development across the life span* (pp. 85–119). Mahwah, NJ: Erlbaum.
- Rothbart, M. K., Ellis, L. K., Rueda, M. R., & Posner, M. I. (2003). Developing mechanisms of temperamental effortful control. *Journal of Personality*, 71(6), 1113–1144.
- Rothbart, M. K., & Posner, M. I. (2006). Temperament, attention, and developmental psychopathology. In D. Cicchetti & D. J. Cohen (Eds.), *Developmental psychopathology: Vol. 2. Developmental neuroscience* (2nd ed., pp. 450–465). Hoboken, NJ: Wiley.
- Rothbart, M. K., & Rueda, M. R. (2005). The development of effortful control. In U. Mayr, E. Awh, & S. W. Keele (Eds.), *Developing individuality in the human brain: A tribute to Michael I. Posner* (pp. 167–188). Washington, DC: American Psychological Association.
- Roy, A. K., Benson, B. E., Degnan, K. A., Pérez-Edgar, K., Pine, D. S., Fox, N. A., et al. (2014). Alterations in amygdala functional connectivity reflect early temperament. *Biological Psychology*, 103, 248–254.
- Rueter, A. R., Abram, S. V., MacDonald, A. W., Rus-

- tichini, A., & DeYoung, C. G. (2018). The goal priority network as a neural substrate of conscientiousness. *Human Brain Mapping*. [Epub ahead of print]
- Sakai, H., Takahara, M., Honjo, N. F., Doi, S. I., Sadato, N., & Uchiyama, Y. (2012). Regional frontal gray matter volume associated with executive function capacity as a risk factor for vehicle crashes in normal aging adults. *PLOS ONE*, 7(9), e45920.
- Sambrook, T. D., & Goslin, J. (2015). A neural reward prediction error revealed by a meta-analysis of ERPs using great grand averages. *Psychological Bulletin*, 141(1), 213–235.
- Saucier, G. (1992). Openness versus intellect: Much ado about nothing? *European Journal of Personality*, 6, 381–386.
- Saudino, K. J., & Wang, M. (2012). Quantitative and molecular genetic studies of temperament. In M. Zentner & R. L. Shiner (Eds.), *Handbook of temperament* (pp. 315–346). New York: Guilford Press.
- Schmidt, L. A., Fox, N. A., Rubin, K. H., Sternberg, E. M., Gold, P. W., Smith, C. C., et al. (1997). Behavioral and neuroendocrine responses in shy children. *Developmental Psychobiology*, 30(2), 127–140.
- Schnack, H. G., Van Haren, N. E., Brouwer, R. M., Evans, A., Durston, S., Boomsma, D. I., et al. (2015). Changes in thickness and surface area of the human cortex and their relationship with intelligence. *Cerebral Cortex*, 25(6), 1608–1617.
- Schuylar, B. S., Kral, T. R., Jacquart, J., Burghy, C. A., Weng, H. Y., Perlman, D. M., et al. (2014). Temporal dynamics of emotional responding: Amygdala recovery predicts emotional traits. *Social Cognitive and Affective Neuroscience*, 9(2), 176–181.
- Schwartz, C. E., Kunwar, P. S., Greve, D. N., Kagan, J., Snidman, N. C., & Bloch, R. B. (2012). A phenotype of early infancy predicts reactivity of the amygdala in male adults. *Molecular Psychiatry*, 17(10), 1042–1050.
- Servaaas, M. N., Riese, H., Renken, R. J., Marsman, J.-B. C., Lambregts, J., Ormel, J., et al. (2013). The effect of criticism on functional brain connectivity and associations with neuroticism. *PLOS ONE*, 8(7), e69606.
- Servaaas, M. N., van der Velde, J., Costafreda, S. G., Horton, P., Ormel, J., Riese, H., et al. (2013). Neuroticism and the brain: A quantitative meta-analysis of neuroimaging studies investigating emotion processing. *Neuroscience and Biobehavioral Reviews*, 37(8), 1518–1529.
- Shackman, A. J., Tromp, D. P., Stockbridge, M. D., Kaplan, C. M., Tillman, R. M., & Fox, A. S. (2016). Dispositional negativity: An integrative psychological and neurobiological perspective. *Psychological Bulletin*, 142(12), 1275–1314.
- Shaw, P., Greenstein, D., Lerch, J., Clasen, L., Lenroot, R., Gogtay, N., et al. (2006). Intellectual ability and cortical development in children and adolescents. *Nature*, 440, 676–679.
- Shiner, R. L., Allen, T. A., & Masten, A. S. (2017). Adversity in adolescence predicts personality trait change from childhood to adulthood. *Journal of Research in Personality*, 67, 171–182.
- Shiner, R. L., & Caspi, A. (2003). Personality differences in childhood and adolescence: Measurement, development, and consequences. *Journal of Child Psychology and Psychiatry*, 44, 2–32.
- Shiner, R. L., & DeYoung, C. (2013). The structure of temperament and personality traits: A developmental perspective. In P. D. Zelazo (Ed.), *The Oxford handbook of developmental psychology: Vol. 2. Self and other* (pp. 113–141). New York: Oxford University Press.
- Shoal, G. D., Giancola, P. R., & Kirillova, G. P. (2003). Salivary cortisol, personality, and aggressive behavior in adolescent boys: A 5-year longitudinal study. *Journal of the American Academy of Child and Adolescent Psychiatry*, 42(9), 1101–1107.
- Slobodskaya, H. R. (2011). Two superordinate personality factors in childhood. *European Journal of Personality*, 25(6), 453–464.
- Smillie, L. D., Cooper, A. J., & Pickering, A. D. (2011). Individual differences in reward-prediction-error: Extraversion and feedback-related negativity. *Social Cognitive and Affective Neuroscience*, 6(5), 646–652.
- Somerville, L. H., Jones, R. M., & Casey, B. J. (2010). A time of change: Behavioral and neural correlates of adolescent sensitivity to appetitive and aversive environmental cues. *Brain and Cognition*, 72(1), 124–133.
- Soto, C. J., & John, O. P. (2014). Traits in transition: The structure of parent-reported personality traits from early childhood to early adulthood. *Journal of Personality*, 82(3), 182–199.
- Soto, C. J., John, O. P., Gosling, S. D., & Potter, J. (2008). The developmental psychometrics of Big Five self-reports: Acquiescence, factor structure, coherence, and differentiation from ages 10 to 20. *Journal of Personality and Social Psychology*, 94(4), 718–737.
- Soto, C. J., John, O. P., Gosling, S. D., & Potter, J. (2011). Age differences in personality traits from 10 to 65: Big Five domains and facets in a large cross-sectional sample. *Journal of Personality and Social Psychology*, 100(2), 330–348.
- Soto, C. J., & Tackett, J. L. (2015). Personality traits in childhood and adolescence structure, development, and outcomes. *Current Directions in Psychological Science*, 24(5), 358–362.
- Specht, J., Bleidorn, W., Denissen, J. J., Hennecke, M., Hutteman, R., Kandler, C., et al. (2014). What drives adult personality development?: A comparison of theoretical perspectives and empirical evidence. *European Journal of Personality*, 28(3), 216–230.
- Specht, J., Egloff, B., & Schmukle, S. C. (2011). Stability and change of personality across the life course: The impact of age and major life events on mean-level and rank-order stability of the Big Five. *Journal of Personality and Social Psychology*, 101(4), 862–882.
- Srivastava, S., John, O. P., Gosling, S. D., & Potter, J.

- (2003). Development of personality in early and middle adulthood: Set like plaster or persistent change? *Journal of Personality and Social Psychology, 84*(5), 1041–1053.
- Tackett, J. L., Daoud, S. L., De Bolle, M., & Burt, S. A. (2013). Is relational aggression part of the externalizing spectrum? A bifactor model of youth antisocial behavior. *Aggressive Behavior, 39*(2), 149–159.
- Tackett, J. L., Herzhoff, K., Harden, K. P., Page-Gould, E., & Josephs, R. A. (2014). Personality × hormone interactions in adolescent externalizing psychopathology. *Personality Disorders: Theory, Research, and Treatment, 5*(3), 235–246.
- Tackett, J. L., Slobodskaya, H. R., Mar, R. A., Deal, J., Halverson, C. F., Baker, S. R., et al. (2012). The hierarchical structure of childhood personality in five countries: Continuity from early childhood to early adolescence. *Journal of Personality, 80*(4), 847–879.
- Taddei, M., Tettamanti, M., Zanoni, A., Cappa, S., & Battaglia, M. (2012). Brain white matter organisation in adolescence is related to childhood cerebral responses to facial expressions and harm avoidance. *NeuroImage, 61*(4), 1394–1401.
- Takeuchi, H., Taki, Y., Sassa, Y., Hashizume, H., Sekiguchi, A., Fukushima, A., et al. (2014). Regional gray matter volume is associated with empathizing and systemizing in young adults. *PLOS ONE, 9*(1), e84782.
- Taki, Y., Thyreau, B., Kinomura, S., Sato, K., Goto, R., Wu, K., et al. (2013). A longitudinal study of the relationship between personality traits and the annual rate of volume changes in regional gray matter in healthy adults. *Human Brain Mapping, 34*(12), 3347–3353.
- Tamnes, C. K., Fjell, A. M., Østby, Y., Westlye, L. T., Due-Tønnessen, P., Bjørnerud, A., et al. (2011). The brain dynamics of intellectual development: Waxing and waning white and gray matter. *Neuropsychologia, 49*(13), 3605–3611.
- Tamnes, C. K., Walhovd, K. B., Grydeland, H., Holland, D., Østby, Y., Dale, A. M., et al. (2013). Longitudinal working memory development is related to structural maturation of frontal and parietal cortices. *Journal of Cognitive Neuroscience, 25*(10), 1611–1623.
- Thibodeau, R., Jorgensen, R. S., & Kim, S. (2006). Depression, anxiety, and resting frontal EEG asymmetry: A meta-analytic review. *Journal of Abnormal Psychology, 115*(4), 715–729.
- Tremblay, R. E., Nagin, D. S., Séguin, J. R., Zoccolillo, M., Zelazo, P. D., Boivin, M., et al. (2004). Physical aggression during early childhood: Trajectories and predictors. *Pediatrics, 114*(1), e43–e50.
- Turan, B., Guo, J., Boggiano, M. M., & Bedgood, D. (2014). Dominant, cold, avoidant, and lonely: Basal testosterone as a biological marker for an interpersonal style. *Journal of Research in Personality, 50*, 84–89.
- Tyrka, A. R., Kelly, M. M., Gruber, J. A., DeRose, L., Lee, J. K., Warren, M. P., et al. (2010). Behavioral adjustment in a community sample of boys: Links with basal and stress-induced salivary cortisol concentrations. *Psychoneuroendocrinology, 35*(8), 1167–1177.
- Urošević, S., Collins, P., Muetzel, R., Lim, K., & Luciana, M. (2012). Longitudinal changes in behavioral approach system sensitivity and brain structures involved in reward processing during adolescence. *Developmental Psychology, 48*(5), 1488–1500.
- Van den Akker, A. L., Deković, M., Asscher, J., & Prinzie, P. (2014). Mean-level personality development across childhood and adolescence: A temporary defiance of the maturity principle and bidirectional associations with parenting. *Journal of Personality and Social Psychology, 107*(4), 736–750.
- Van Egeren, L. F. (2009). A cybernetic model of global personality traits. *Personality and Social Psychology Review, 13*(2), 92–108.
- Vijayakumar, N., Whittle, S., Dennison, M., Yuecel, M., Simmons, J., & Allen, N. B. (2014). Development of temperamental effortful control mediates the relationship between maturation of the prefrontal cortex and psychopathology during adolescence: A 4-year longitudinal study. *Developmental Cognitive Neuroscience, 9*, 30–43.
- Vreeke, L. J., & Muris, P. (2012). Relations between behavioral inhibition, Big Five personality factors, and anxiety disorder symptoms in non-clinical and clinically anxious children. *Child Psychiatry and Human Development, 43*(6), 884–894.
- Wacker, J., Chavanon, M. L., & Stemmler, G. (2010). Resting EEG signatures of agentic extraversion: New results and meta-analytic integration. *Journal of Research in Personality, 44*(2), 167–179.
- Wacker, J., Mueller, E. M., Hennig, J., & Stemmler, G. (2012). How to consistently link extraversion and intelligence to the catechol-O-methyltransferase (COMT) gene: On defining and measuring psychological phenotypes in neurogenetic research. *Journal of Personality and Social Psychology, 102*(2), 427–444.
- Wacker, J., Mueller, E., Pizzagalli, D. A., Hennig, J., & Stemmler, G. (2013). Dopamine-D2-receptor blockade reverses the association between trait approach motivation and frontal asymmetry in an approach-motivation context. *Psychological Science, 24*(4), 489–497.
- Wacker, J., & Smillie, L. D. (2015). Trait extraversion and dopamine function. *Social and Personality Psychology Compass, 9*(6), 225–238.
- Wagner, J., Ram, N., Smith, J., & Gerstorf, D. (2016). Personality trait development at the end of life: Antecedents and correlates of mean-level trajectories. *Journal of Personality and Social Psychology, 111*(3), 411–429.
- Wang, Z., Chen, N., Petrill, S. A., & Deater-Deckard, K. (2013). Observed personality in childhood: Psychometric and behavioural genetic evidence of two broad personality factors. *European Journal of Personality, 27*(1), 96–105.
- Webb, S. J., Monk, C. S., & Nelson, C. A. (2001). Mech-

- anisms of postnatal neurobiological development: Implications for human development. *Developmental Neuropsychology, 19*(2), 147–171.
- Westlye, L. T., Bjørnebekk, A., Grydeland, H., Fjell, A. M., & Wathovd, K. B. (2011). Linking an anxiety-related personality trait to brain white matter microstructure: Diffusion tensor imaging and harm avoidance. *Archives of General Psychiatry, 68*(4), 369–377.
- Wright, A. G., Creswell, K. G., Flory, J., Muldoon, M., & Manuck, S. B. (2018). Neurobiological functioning and the personality trait hierarchy: Central serotonergic responsiveness and the stability meta-trait. Retrieved from <https://osf.io/ru9ve>.
- Wu, C. C., Samanez-Larkin, G. R., Katovich, K., & Knutson, B. (2014). Affective traits link to reliable neural markers of incentive anticipation. *NeuroImage, 84*, 279–289.
- Xu, J., & Potenza, M. N. (2012). White matter integrity and Five-Factor personality measures in healthy adults. *NeuroImage, 59*(1), 800–807.
- Yarkoni, T. (2015). Neurobiological substrates of personality: A critical overview. In M. Mikulincer & P. R. Shaver (Eds.), *APA handbook of personality and social psychology: Vol. 4. personality processes and individual differences* (pp. 61–84). Washington, DC: American Psychological Association.
- Yeo, B., Krienen, F., Sepulcre, J., Sabuncu, M., Lashkari, D., Hollinshead, M., et al. (2011). The organization of the human cerebral cortex estimated by intrinsic functional connectivity. *Journal of Neurophysiology, 106*(3), 1125–1165.