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Editorial overview: Multidisciplinary and interdisciplinary perspectives on parenting

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In the neurobiological era of the genome, the brain and hormones the influence of parenting on child development is not self-evident. In this special issue of Current Opinion in Psychology the role of parents and other caregivers in children's development is examined, and the limits of their influence is studied, from conception to adulthood, in humans as well as in various non-human species. How crucial are parents and other caregivers in shaping their children's development, not only in relatively regular settings and circumstances but also in extreme situations of family violence, institutional neglect and other adverse conditions? And what processes are underlying parenting behavior? What influence do children in their turn have on their parents and caregivers, and in what ways do they trigger specific parental interactions, and help build a relationship? How is the neurobiology of parenting and child development limiting or opening up opportunities for (preventive) intervention?

This special issue on Parenting deliberately goes beyond the threadbare dichotomy of nature versus nurture. Parenting itself is a complex plaiting of neurobiological and environmental influences, and the same is true for child development. Without parents (or their substitutes) newly born offspring withers away soon, and chances for survival and procreation will be extremely bleak. Applying Darwin's evolutionary theory to child development, Bowlby emphasized the critical role of protective parental figures, he argued that the antithesis of innate versus acquired behavioral traits is unreal and unproductive. He used Hebb's famous analogy of the rectangle: the area of a rectangle must be computed as a product of length and width. Only length or width is insufficient. The same holds for parenting and child development that are also a product of genetic endowment and environment.

The special issue on Parenting is divided into seven sections:

- *Evolutionary theories of parenting*
- *Neurobiology of parenting*
- *Socio-cultural diversity in parenting*
- *Parenting modalities*
- *Alloparenting*
- *Parenting in adverse conditions*
- *Parenting interventions*

Evolutionary theories of parenting

In the developmental sciences not many 'grand theories' are left. Most theories are restricted to small segments of development (*e.g.*, executive functions), with a small number of testable hypotheses and modest

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implications for practice or policy. In the parenting literature however three ambitious, wide-ranging theories are proposed. Life history theory ([Cabeza de Baca and Ellis](#), this issue) considers parental behavior to be strategically preparing offspring for environmental opportunities and constraints, and warns against premature labeling of such strategic parenting as deviant or bad. Differential susceptibility theory is also grounded in evolutionary thinking about parental influences. The theory proposes that environmental influences on children might be dependent on temperamental characteristics or the genetic make-up of the children, not only for worse (as stipulated in the diathesis-stress model) but also for the better ([Belsky and Van IJzendoorn](#), this issue). Attachment theory was the first theory of human development rooted in Darwin's evolutionary thinking and research. Several decades of empirical studies on the core hypotheses make clear that insecure or disorganized attachment are a risk factor for later psychosocial functioning ([Fearon and Roisman](#), this issue).

Neurobiology of parenting

Much of the neurobiological research on human parenting has been inspired by ground-breaking work on non-human species, in particular on rodents and non-human primates. Nevertheless, this is work in progress, and better attunement between animal and human studies of parenting opens new opportunities for reciprocal advances and new scientific insights ([Knop et al.](#), this issue). In the last century, the role of hormones and neurotransmitters such as oxytocin was examined mostly during the perinatal period. In recent years, however, the influence of endogenous as well as experimentally manipulated hormone levels on parenting has become the center of attention, and parent–infant interaction seems to be partly shaped by oxytocin ([Feldman and Bakermans-Kranenburg](#), this issue). This seems not only true for mothers but also for fathers, as paternal caregiving is modulated by hormones and neuropeptides as well, and shows its own dedicated neural circuitry ([Rilling and Mascaró](#), this issue). Non-invasive imaging techniques such as functional and structural Magnetic Resonance Imaging (MRI) help to uncover the parental brain circuitry that seems to be involved in processing infant stimuli such as infant faces or cry sounds ([Swain and Ho](#), this issue).

Socio-cultural diversity in parenting

Compared to the investment in neurobiological studies the socio-cultural influences on parenting and child development appear to have been neglected in recent years, despite their great potential in explaining large parts of the variance. Intra-cultural differences in parenting seem substantial, and while ethnic minority parents on average are somewhat less sensitive and more authoritarian, differences within ethnic minority groups are large as well ([Prevoo and Tamis-LeMonda](#), this issue). Careful study of acculturation of immigrant parents requires designs in which parents still living in the culture of origin, parents in transition to a new culture, and parents residing in the culture of destination are compared ([Bornstein](#), this issue). In such studies of intracultural and intercultural differences in parenting the role of socio-economic status might be crucial for understanding the basis of seemingly cultural differences ([Roubinov and Boyce](#), this issue). Immigrant families often add to the variety of religious beliefs in the country of destination, which makes it more important than ever to take religion into account as a predictor of variations in parenting beliefs and practices ([Goeke-Morey and Cummings](#), this issue).

Parenting modalities

Diversity of parenting behavior in animals is large, ranging from the absence of any care to intensive bi-parental care to exclusively maternal or exclusively paternal care. In 80% of birds parenting is provided by males as well as females. Careful study of ecological conditions suggests that selection pressures are critically important in triggering maternal, paternal or bi-parental care (Bales, this issue). Research on classic parenting styles dates back at least half a century, and the authoritative style has emerged as most optimal. Recent work emphasizes context-dependent use of various parenting styles as most effective for optimizing child development in specific socio-cultural niches (Smetana, this issue). Decades of parenting research started with observing parents and their infants only after birth, but evidence is accumulating on the influence of prenatal parenting (Glover and Capron, this issue). Fortunately, human newborns meet with parents who are already equipped with intuitions about how to deal with infant signals. The orbitofrontal cortex might have a special role in prompt and subconscious responses to infant cues, and to serve as neural foundation of intuitive parenting (Parsons et al., this issue). In the animal world parents are 'intuitively' inclined to protect their offspring, and the same may be true of human parents, but protective parenting is often neglected in research on human parenting (Bakermans-Kranenburg and Van IJzendoorn, this issue), although it probably is an important dimension throughout childhood. In adolescence, for example, parental modulation of risk-taking behavior and challenging peer relationships is considered increasingly important (Kobak et al., this issue). Although most parenting research focuses on mothers and their influences on child development, paternal psychopathology might have far-reaching consequences for child development (Iles and Ramchandani, this issue). The greater variety of family constellations (single parents; same-sex parent families) provide unique opportunities to examine the flexibility of parents as well as children to adapt to various ecological niches (Golombok, this issue).

Alloparenting

Human infants have always been raised by more than one adult or caregiver, but care by biologically non-related, professional or substitute parents is a rather new phenomenon in human evolution that requires careful examination to see what developmental consequences such extended non-kin care implies. Adoption and foster care belong to the most effective interventions in the lives of infants who would be at great risk if they remained in their family of origin or in institutional care. Recent changes in adoption and foster care policies and practices have implications for the development of the children involved (Grotevant and Lo, this issue). The dramatic short-term and long-term influences of orphanage life on institutionalized infants and the powerful positive effects

of foster care have been experimentally demonstrated in the unique Bucharest Early Intervention Project (Zeanah et al., this issue). Center day care is incomparable to institutionalized care. However, even well-equipped group care with professional caregivers might have some impact on children's cortisol and immune system (Vermeer and Groeneveld, this issue).

Parenting in adverse conditions

Some parents have less than optimal capabilities or opportunities to raise their children, whereas in other families problems may arise from child's characteristics. Family violence and child maltreatment have wide-ranging consequences for child neurobiological and social development (Cyr and Alink, this issue), which is also true for addicted parents (Rutherford and Mayes, this issue) and parents with a HIV-diagnosis (Rochat et al., this issue). Parents with intellectual disabilities often struggle with adverse conditions which might create more important issues for raising their children than the disability per se (Schuengel et al., this issue). Some parental problems are co-morbid with depression which has been documented to have a major impact on children's development, and is quite resistant to change (Galbally and Lewis, this issue). Classic child problems are related to interrupted sleep and persistent crying. From a transactional perspective, sleep interventions might profit from a focus on the parent-infant dyad, making parents the crucial change agents (Tikotzky, this issue). Persistent crying might be very challenging for most parents, and to prevent spiraling into abusive parenting supportive interventions are badly needed (Zeifman and St James-Roberts, this issue).

Parenting interventions

Evidence-based parenting interventions still are relatively scarce. Some of the most effective programs are firmly rooted in theory, in particular attachment theory (Dozier and Bernard, this issue), or social learning theory (Overbeek, this issue; Gardner and Leijten, this issue; Fisher and Skowron, this issue), or a combination of these two theoretical models (Juffer et al., this issue). Emphasis is on enhancing parental warmth and sensitive responsiveness, but also on sensitive limit setting, in particular with terrible twos and threes (Juffer et al., this issue), 4–8 years olds (Overbeek, this issue), and adolescents (Gardner and Leijten, this issue). Emerging issues are the neurobiological imprint of interventions (Dozier and Bernard, this issue), what works for whom (Juffer et al., this issue; Overbeek, this issue), and effective components of complex interventions (Gardner and Leijten, this issue). Implementation of intervention protocols at a wider scale meets its own translational problems that have been addressed more systematically in recent years (Fisher and Skowron, this issue).

Conclusion

Parenting is a complex phenomenon with far-reaching effects on child development but also on societal issues

such as physical health, depression, delinquency, addiction, school performance and peer relationships, to mention just a few examples. Intergenerational transmission of behavior problems, through parents, cannot be explained by shared genes only. We need genes as well as memes to explain cultural transmission, and we need the (shared and unique) environment of parenting in interaction with the child's genetic make-up to adequately explain child development, and to reveal the scientific foundation for intervention efforts to support

parents. Parenting evolves at various levels of functioning, from neurons and hormones to socio-economic, cultural, and religious contexts. Therefore, parenting can only be studied fruitfully from a wide range of disciplines including animal research. It is our hope that this special issue brings these disciplines together, not only as an overview to be studied in interdisciplinary graduate courses, but also as a source of inspiration for interdisciplinary research on parenting.