

New approaches to divorce with children: A problem of public health

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Abstract

This broad review elaborates on the most up-to-date knowledge on biochemical and psychobiological aspects of parental loss and other childhood adversities during divorce involving minor children. So far, divorce involving minor children was unfortunately considered by authorities only as a purely juridical problem, and this approach has often allowed a completely different approach according to the Courts. Now, scientific research, also making use of animal models, is demonstrating the biological basis of the problem and the indisputable consequences on the well-being and health of children. The innovative conclusion of this review is that this argument (because of its frequency and gravity) is primarily a question of public health and that it is necessary to further harmonize practices in this area.

Keywords

adolescence, children, community health promotion, divorce, family, inequalities, psychological distress, public health psychology, risk factors, risk reduction

Introduction

Science has demonstrated direct effects on infants and young adult health caused by childhood adversity. This damage can be classified into two different categories: the effects caused by chronic stressors and, on the other hand, the effects caused by traumatic experiences. Many of them belong to divorce-correlated situations.

The definition of childhood adversity includes the following:

1. *Chronic stressors.* Parental loss (and parental lack), parental separation with long-term family conflict, neglect, parental education, parental mental health, poverty, and drug use in the family.
2. *Traumatic experiences.* Physical abuse, verbal abuse, mental abuse, witnessing violence within the home, and severe childhood illness.

Although it is not always possible to demonstrate a causal effect (as it is for animal models), it is important to highlight some psychobiological damage associated with parental loss and other childhood adversities as they touch on so far unsuspected fields and because the consequences can become apparent after 10, 20, or 30 years.

The problem is significant as parental separation concerns more than 10 million minors in Europe, and more than one million children experience every year the divorce of their parents in United States, making divorce involving children a question of public health. Parental separation is in fact the first cause of parental loss in Western countries (it occurs in more than 40% of divorces in some countries) and is often linked to other childhood adversities like, for example, parental conflict or witnessing violence. In fact, it is noteworthy that until a few years ago, the research in this area focused on effects of divorce “tout court” without considering whether after divorce the child could have still frequent, satisfying, and regular contact with both parents because shared parenting was rare.

The need for very large data sets to make solid inferences about very small subgroups of the population severely restricted the possibility to statistically validate research on children living in a shared-parenting situation. The bias was

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(and often still is) to attribute to divorce consequences regarding, for instance, parental loss or family conflict.

Only in recent years, the diffusion, especially in Nordic countries, of shared parenting allowed wide comparative research to take place (those forming part of the ELVIS Project was significant and widespread, in Sweden), and to see that this type of parenting could have a huge influence on the consequences of divorce for child well-being. This topic will be discussed further in this article.

The research cited in this review was published almost entirely in international peer-reviewed journals or governmental reports, found in databases in PubMed, PsycINFO, Social Science Research Index, MedSciNet, preferring research—where it was possible—as broad as possible and considered able to give a meaningful contribution to five areas: (1) biological effects on animal models health linked to parental separation, (2) psychobiological effects on infant health linked to parental separation and other childhood adversities, (3) biological consequences of parental loss and childhood adversities, (4) social effects of parental loss and stress, and (5) comparison between possible effects of shared and sole parenting on child and young adult health.

Knowledge on biological effects on animal models of health linked to parental separation

We must not be surprised: we have in fact a lot of evidence in several species of animals of the organic effects of childhood adversity, especially parental loss and parental separation. Many more studies have addressed the effects of maternal loss, but also the studies on the effects of paternal loss are increasing rapidly. Usually, this research concerns animals with co-parental care of the offspring and which are frequently monogamous: examples include birds, mammals, and also primates. Among a multitude of research, we will cite just three examples.

In this area, Hoffman et al. (1995) found that in titi monkeys, separation from the mother for 1 hour did not elicit an adrenocortical response from the infant unless the father was also removed. Separation from the father elicited a significant elevation in adrenocortical activity even when the mother remained with the infant during the separation period. Infants showed highest cortisol levels and vocalization rates when both parents were removed and the infant remained alone in the living cage for 1 hour. As in previous research, infants maintained higher levels of contact with the father than with the mother.

Bambico et al. (2013) showed that father absence in the monogamous California mouse impairs social behavior and modifies dopamine and glutamate synapses in the medial prefrontal cortex.

Finally, we recall that exposure to enriched or impoverished environmental conditions, experience, and learning

are factors which influence brain development, and it has been shown that neonatal emotional experience significantly interferes with the synaptic development of higher associative forebrain areas. Ovtscharoff et al. (2006) analyzed the impact of paternal care, that is, the father's emotional contribution toward his offspring, on the synaptic development of the anterior cingulate cortex. The light and electron microscopic comparison of biparentally raised control animals, and animals which were raised in single-mother families revealed no significant differences in spine densities on the apical dendrites of layer II/III pyramidal neurons and of asymmetric and symmetric spine synapses. However, significantly reduced densities (−33%) of symmetric shaft synapses were found in layer II of the fatherless animals compared to controls. This finding indicates an imbalance between excitatory and inhibitory synapses in the anterior cingulate cortex of father-deprived animals. Results query the general assumption that a father has less impact on the synaptic maturation of his offspring's brain than the mother.

Psychobiological effects on infant health linked to parental separation and other childhood adversities

Although the most known effects of the divorce process are commonly evident in the behavioral and emotional fields, physical morbidity of the children was also described in situations of parental loss and often correlated childhood adversities. For example, a study from Taiwan (Juang et al., 2004) found a clear link between parental divorce and children's daily headache (chronic daily headache-CDH).

Various studies have, moreover, described increased prevalence of attention deficit and hyperactivity disorder (ADHD) in children in situations of divorce and abuse (and not always for a selection effect); for example, (Cohen et al., 2002) interactional effects of marital disruption and abuse were found for risk for lifetime ADHD, with parental marital disruption and having been physically abused combining to increase the risk indeed 15 times for diagnosis of lifetime ADHD. In this study, parental marital status alone was not a significant risk factor for adolescent psychopathology, but a childhood adversity as physical abuse was a significant risk factor for several diagnostic categories.

Much research (but all conducted in monoparental countries, where shared parenting is uncommon and divorce is often linked to the increasing adverse effect of parental loss, high rates of family conflict, etc.) found a correlation between parental divorce and eating disorders and excessive weight (Igoin-Apfelbaum, 1985; Johnson et al., 2002; Yannakoulia et al., 2008).

Another study from France (Roustit et al., 2011) examined the relationship between adverse family environments during childhood and self-perceived health in adulthood. It was found that exposure to separation and divorce in childhood

was associated with worse health perception in older age. The study referred to mental health as well as to physical status. Moreover, a study of almost 1 million children in Sweden observed that children growing up with single parents were more than twice as likely to experience a serious psychiatric disorder, commit or attempt suicide, or develop an alcohol addiction (Ringsback-Weitoff et al., 2003).

Similarly, Hailey Maier and Lachman (2000) found in a sample of 4242 adults who responded to the survey of Midlife Development in the United States that loss or separation from parents in childhood does have a negative impact on health problems and psychological adjustment in midlife, and that the effects are more pronounced for divorce. It appears that parental divorce leads to lower education and income attainment, an increase in drug use, and lower levels of family support which may result in a greater number of health problems later in life, while parental death was also related to lower educational attainment but showed no relationship with adult health.

Although both experiences (parental loss as consequence of divorce and as consequence of parental death) can impact economic resources, social resources may be more affected by parental divorce, but parental divorce can result in changes in the child's relationship with both parents, whereas parental death is less likely to disrupt the child's relationship with the remaining parent.

In further research, Tyrka et al. (2008) found that participants with separation/desertion and those with parental death were significantly more likely than the control subjects to report the subsequent onset of symptoms of a depressive or anxiety disorder but Otowa et al. (2014) went beyond finding that early parental separation has stronger and wider effects on adult psychopathology than parental death. Going into details, parental separation was associated with a wide range of adult psychopathology, whereas parental death was specifically associated with phobia and alcohol dependence. Maternal and paternal separations were almost equally associated with most forms of psychopathology. Structural equation modeling suggested that parental loss accounted for about 10 percent of the variance of adult psychopathology, of which parental separation had the strongest impacts on risk for depression and drug abuse/dependence (11% of the total variance).

Finally, a key body of research in Israel (Agid et al., 1999) has drawn several conclusions:

1. Increased overall rates of early parental loss are observed in major depression, bipolar disorder, and schizophrenia, but the finding is most striking in major depression followed by schizophrenia. The finding in regard to major depression is consistent with the majority of published studies in which loss is not broken down into categories, while the literature on bipolar disorder and schizophrenia is insufficient for comparison.

2. Patients with major depression manifest a significantly increased rate of early parental loss due to permanent separation but not due to death, as observed by a number of methodologically rigorous case-control and epidemiological studies.
3. Loss of mother may be more significant than loss of father; although in this analysis, this observation was at a trend level only.
4. Loss at an early age (less than 9 years) is of greater significance than later loss, as previously observed by several researchers.
5. A specific sensitivity of females rather than males to loss in major depression and bipolar disorder is suggested by this research but cannot be regarded as definitive because of sample size.
6. Genetic predisposition may influence the degree of susceptibility of the individual to the effects of early environmental stress and may also determine the psychopathological entity to which the individual is rendered vulnerable as a consequence of the stress.

Biological consequences of parental loss and other childhood adversities: latest knowledge

By a more biological point of view, we have a lot of evidence too; for instance, Nicolson (2004) showed that cortisol levels in adult men are increased if in their childhood they were subject to parental loss or other adversities.

Similarly, Luecken (1998) found that both childhood loss of a parent and poor quality of care are associated with long-term increases in blood pressure and altered neuro-hormonal responses to stress. More in detail, repeated-measures analysis of covariance revealed significant main effects on blood pressure of both parental loss and low quality of family relationships (all p values < 0.05) such that subjects who lost a parent or reported poor-quality family relationships (FR) showed higher blood pressure across all periods. The loss by FR by period interaction was not significant. An FR by period interaction was found for cortisol during the trial, in which poor-quality FR subjects showed increased cortisol, whereas all others showed decreases. A loss by period interaction was found for cortisol during the speech, in which cortisol increased in loss subjects and decreased in non-loss subjects.

We must highlight that chronic augmentation of cortisol due to influence on hypothalamo-hypophysis-adrenocortical axis is linked to several disease in adulthood and senescence like psychopathology (e.g. depression), diabetes II, obesity, and osteoporosis.

It is noteworthy that through the action of glucocorticoids on the central nervous system, repeated or chronic psychological stress can inhibit the thyroid-stimulating hormone (TSH) secretion (Helmreich et al., 2005).

In psychological stress, conversely, growth hormone (GH) responses are rarely seen. Rather, there is GH secretory defect with prolonged psychosocial stress causing a wide pattern of clinical situations toward the rare condition called psychosocial dwarfism (PD) (Delitala et al., 1987; Magner et al., 1984; Skuse et al., 1996)

PD is a term describing severe childhood or adolescent short stature and/or delayed puberty due to emotional deprivation, inadequate parenting, or psychological harassment. Decreased GH secretion, that is reversible after separation of the child from the responsible environment, is a characteristic finding in this condition (Albanese et al., 1994). The treatment with GH is not usually of benefit until the psychosocial situation is improved. PD is also associated with a variety of behavioral abnormalities, such as depression and bizarre eating PD were first studied in infants in founding homes or orphanages who failed to thrive, had decreased growth, and even died. It was hypothesized that this failure to thrive resulted from lack of attention and stimulation and/or deficient nutrition. Later, it was shown that weight gain was independent of food intake, whereas with a caring and attentive environment, growth advanced and the psychological profile improved. In addition to low GH secretion, these patients had a dysfunctional thyroid axis, resembling the “euthyroid sick” syndrome (Dom et al., 1993; Green et al., 1984).

Battaglia et al. (2009) showed that childhood separation anxiety can cause, in genetically prepared people, panic disorders.

More in detail shared genetic determinants appeared to be the major underlying cause of the developmental continuity of childhood separation anxiety disorder into adult panic disorder and the association of both disorders with heightened sensitivity to CO(2). Inasmuch as childhood parental loss is a truly environmental risk factor, it can account for a significant additional proportion of the covariation of these three developmentally related phenotypes.

In the area of childhood adversities, Lacey et al. (2013) found (but in the United Kingdom, a monoparental country where parental loss after divorce is common: it would be interesting to know whether the researchers would have obtained the same outcome in a biparental country such as Sweden, where shared parenting is common and parental loss rare) that parental separation increases C Reactive Protein (CRP) levels (correlated with type II diabetes, coronary heart disease, depression, inflammatory diseases, etc.) in adulthood via chains of disadvantage across the life course.

Hartwell et al. (2013) found an important association of elevated basal cytokines with childhood adversity in a sample of healthy adults demonstrating the long-term impact of childhood trauma and stress on homeostatic systems. Importantly, this association was found in healthy adults, suggesting that these alterations may precede the development of significant stress-related psychiatric disorder or disease.

Moreover, Kiecolt-Glaser et al. (2011) demonstrated that childhood adversity heightens the impact of later-life

caregiving stress on telomere length and inflammation and are so related to continued vulnerability among older adults enhancing the impact of chronic stress factors: it means more psychiatric disorders (for abuse has been demonstrated to lead to an increase in metabolic diseases, cancers, and lung diseases).

This new epigenetic approach allowed the authors to observe that presence of multiple childhood adversities was related to both heightened interleukine-6 (IL-6) and shorter telomeres compared with the absence of adversity; the authors observed that the telomere difference could translate into a 7- to 15-year difference in life span. Abuse was associated with heightened IL-6 and tumor necrosis factor-alpha (TNF- α) levels; for TNF- α , this relationship was magnified in caregivers compared with controls. Moreover, abuse and caregiving status were associated significantly and independently with higher levels of depressive symptoms. Dysregulation of TNF production has been implicated in a variety of human diseases including Alzheimer's disease, cancer, major depression, psoriasis, and inflammatory bowel disease (IBD) (Brynskov et al., 2002; Dowlati et al., 2010; Locksley et al., 2001; Swardfager et al., 2010; Victor and Gottlieb, 2002).

IL-6 stimulates the inflammatory and auto-immune processes in many diseases such as diabetes, atherosclerosis, depression, Alzheimer's disease, systemic lupus erythematosus, multiple myeloma, prostate cancer, Behçet's disease, and rheumatoid arthritis (Gadó et al., 2000; Hirohata and Kikuchi, 2012; Nishimoto, 2006; Smith et al., 2001; Tackey et al., 2004).

Opacka-Juffry and Mohiyeddini (2012) contributed with interesting research which showed evidence that adverse experience in early life (such as but not exclusively parental loss) is negatively associated with oxytocin system activity in adulthood (correlated with depression and anxious disorders) and offer further insight into mediator and moderator effects on this link. Gunther Meinlschmidt and Christine Heim (2007) found altered central sensitivity to the effects of oxytocin after early parental separation and suggest that future studies should replicate these results and scrutinize the role of oxytocin in mediating risk versus resilience to psychopathology after early social adversity.

A new topic is the possible correlation between height and familial disruption: Sheppard et al. (2015) argue that familial disruption during early childhood has far-reaching repercussions for the health of both men and women. Their study assesses adult height as one such health-relevant outcome. For men, parental death and divorce during early childhood were associated with later puberty. Later puberty was associated with shorter adult height. Path analyses demonstrated that the relationship between parental divorce and height was completely mediated by age at puberty, although parental death was only partially mediated by age at puberty.

Among women, it was found that the father's death during early childhood was associated with earlier puberty, which was in turn associated with shorter adult stature. The

relationship between paternal death and height is entirely mediated by age at puberty; no evidence of a direct relationship between childhood family disruption and adult height.

Another link between parenting and human biology was found by Human Lauren et al. (2014). They observed that adolescents whose daily experiences were perceived more accurately by their parents reported better psychological adjustment (lower stress and depression) and a greater sensitivity of their immune cells to anti-inflammatory signals from cortisol (i.e. diminished production of inflammatory proteins when cells were stimulated with the combination of a bacterial product (lipopolysaccharide) and cortisol; $|\beta|$ range, 0.38–0.53, all p values < 0.041).

The authors argued that more attentive parental care regarding adolescents' daily experiences is associated with better adolescent psychological adjustment and a more sensitive anti-inflammatory response to cortisol. These results provide preliminary evidence that more attentive parental care regarding their adolescent's daily experiences may be one specific daily parent factor that plays a role in adolescent health and well-being.

It is also noteworthy that Scott et al. (2008) found that childhood adversities predicted adult-onset asthma with risk increasing with the number of adversities experienced.

Another body of research found that all childhood adversity was associated with elevated markers of inflammation in breast cancer survivors, with potential negative implications for health and well-being. In particular, chaotic home environment showed unique links with inflammatory outcomes (Crosswell et al., 2014).

Finally, we recall that it is commonly known that adverse life events increase vulnerability to affective disorders later in life, possibly mediated by methylation of the serotonin transporter gene methylation. All that granted, Van der Knaap et al. (2014) demonstrate a higher level of serotonin transporter gene methylation after stressful life events in adolescents, with a more pronounced association for stressful events during adolescence than during childhood.

Social effects of parental loss and other childhood adversities

Much evidence on this issue has existed for a long time: for more than 20 years, several research projects were conducted on this topic (Metzler et al., 1994). In 1994, a study of 700 adolescents, found that "compared to families with two natural parents living in the home, adolescents from single-parent families have been found to engage in greater and earlier sexual activity."

In wide and authoritative statistics in the United States, researchers have found that fatherless children are at a dramatically greater risk of drug and alcohol abuse, mental illness, suicide, poor educational performance, teen pregnancy, and criminality (US Department of Health and Human Services, 1993).

At the same time, Duncan et al. (1994) found that teenagers living in single-parent households are more likely to abuse alcohol and at an earlier age compared to children reared in two-parent households.

Also, in the United States, a study of 156 victims of child sexual abuse found that the majority of the children came from disrupted or single-parent homes; only 31 percent of the children lived with both biological parents. Although stepfamilies make up only about 10 percent of all families, 27 percent of the abused children lived with either a stepfather or the mother's boyfriend (Gomes-Schwartz et al., 1988). Similarly, it was found by Deane Scott Berman (1995) that absence of the father in the home affects significantly the behavior of adolescents and results in the greater use of alcohol and marijuana.

Finally, a more recent study from the Netherlands (Houben-van Hertten et al., 2015) aimed to confirm potential determinants of health-related quality of life in children aged 4–11 years in the general population in the Netherlands. As part of a population-based cross-sectional study, the Child Health Questionnaire (CHQ) Parental Form 28 was used to measure health-related quality of life in school-aged children in a general population sample, and parents of 10,651 children aged 4–11 years were interviewed from January 2001 to December 2009. Multivariate and regression analyses demonstrated a lower CHQ psychosocial summary score for children who had >1 conditions: disorders or acute health complaints, boys, obese children, and, finally, children of single parents.

Is shared parenting preventive of childhood adversities and parental loss? Does it have a positive influence on well-being? How?

Most studies indicated that divorce has a negative impact on children, but there are many different interpretations about the consequences of this situation on children, whether the negative impact arises from the divorce itself or more likely from the process, the long-term conflict, the inadequate parenting, the parental loss (very frequent in most countries) and whether this process can actually sometimes be good for the children involved in some situations.

But, as we saw earlier, today, we have a lot of evidence showing that separation with minor children is mainly a question of public health and it should be treated first with a scientific approach, following the experiences that have demonstrated reduction in the risks of parental loss and other childhood adversities.

Parental loss

The preventive effect of shared parenting on parental loss is clear and indisputable. There is a tight inverse correlation between shared parenting and parental loss: in countries

where shared parenting has become common parental loss decreased significantly, while in countries where shared parenting is rare, childhood adversity such as parental loss is higher in each case: in Denmark, parental loss after parental separation has actually decreased to 12 percent; in Sweden, it has quickly decreased to 13 percent; in Germany, it is 20 percent; and in Italy and Greece, it is steady on about 30 percent (Bergström, 2015; Lohse, 2015; Paparigopoulos, 2016; Schiratzki, 2009; Suenderhauf, 2015; Vezzetti, 2009).

Some French research (Régnier-Loilier, 2013) observes that the probability of losing contact with the father is 1 percent when the judge ordered joint physical custody at least in the first 6 months of judicial trial, but it increased up to 21 percent if the judge ordered the traditional arrangement. Yet, in the same study, the researcher observes that the distance between the two parental homes (a parameter on which the judiciary system can have a huge influence allowing the emigration of one parent with the child) has a significant influence. The study shows that the probability of losing contact with the father is 12 percent if the father and child live close to each other (15 minutes apart), but it increases up to 33 percent if they live more than 4 hours distance from each other and up to 81 percent if they are so far apart that the father is not able to quantify the necessary travel time.

Conflict

Extensive research has confirmed the positive effects of shared parenting on several issues correlated with childhood adversity (like minimizing parental conflict and other trauma separation-correlated) also if this aspect is more controversial. The Australian experience seems to show that the conflict is reduced by the new law on shared parenting (2006). In 2003/2004, the claims brought before the Family Court were 45,004; in 2006/2007, were just 27,313; and in 2008/2009, were 18,633. At the same time, the general unrest was increased by the Federal Magistrates Court: here, the claims were 70,261 in 2003/2004; 76,807 in 2006/2007; and 79,441 in 2008/2009 (Vezzetti, 2009).

In Spain, the presumption of Joint Physical Custody (JPC) was introduced only in some regions and at different times. In Catalonia, the law was approved in 2010 when the claims for gender violence were 6155. In 2013, they were 5403 (-12.22%). In Corte Valencia, the law on JPC was approved in 2011, and the claims for gender violence were 4712. In 2013, they were reduced to 4056 (-13.92%). In Aragon, the law on JPC was introduced in 2010 when claims were 603. In 2013, the situation was steady (617 claims, +2.3%) (Data from Spanish "Consejo general del poder judicial," 2014).

Therefore, it is not possible to argue about the negative effect of shared parenting on family conflict as conversely the global number of allegations has decreased.

In addition, we recall that in Sweden and Denmark, the judicial trials have decreased as the shared parenting has increased: actually, only 2 percent of divorcing couples in Sweden enter a Court and about the same happens in Denmark (Bergström, 2015; Lohse, 2015).

Nevertheless, in many jurisdictions, there is a legal presumption against shared parenting in high-conflict cases, but, conversely, shared parenting provides an incentive for parental cooperation, negotiation, mediation, and the development of parenting plans.

In fact, a wide body of literature (Buchanan and Maccoby, 1996; Cashmore and Parkinson, 2010; Fabricius et al., 2012; Kline et al., 1989; Melli and Brown, 2008; Sodermans et al., 2013; Warshak, 2016) showed that there is no significant difference between conflict between families in joint physical custody arrangement and families in sole custody.

Moreover, Fabricius and Luecken (2007) observed in a sample of 266 university students, whose parents divorced before they were 16 years old, that there is no interaction between time with father and exposure to parent conflict; thus, more time with the father was beneficial in both high- and low-conflict families, and more exposure to parental conflict was detrimental at both high and low levels of time with father.

The Stanford Child Custody Study found that children in joint physical custody (living at least one-third of the time with their fathers) compared with children in sole physical custody were most satisfied with the custody plan and showed the best long-term adjustments, even after controlling for factors that might predispose parents to select joint physical custody (such as education, income, and initial levels of parental hostility). In fact, in 80 percent of the joint physical custody families, one or both parents initially did not want and did not agree to the arrangement (Maccoby et al., 1993).

That explains why the Conference of International Council on Shared Parenting in 2014 stated that

shared parenting is recognized as the most effective means for both reducing high parental conflict and preventing first-time family violence, there is consensus that legal and psychosocial implementation of shared parenting as a presumption should proceed with the goal of reducing parental conflict after separation.

General well-being

Concerning other childhood adversities and the best arrangements for children from separated couples, the outcomes of the scientific literature are represented by 74 comparative studies published in peer-reviewed papers or governmental reports between 1977 and 2014. They were subject to two meta-analyses which compared sole and shared custody between 1977 and 2014. The most noteworthy meta-analysis (2014) was written by Linda Nielsen (Wake Forest University).

This article addresses this question by summarizing the 40 studies that have compared children in joint physical custody (at least 35% of time spent by each parent) and children in sole custody during the past 25 years.

The 40 studies were identified by searching the databases in PsycINFO and Social Science.

Research index. The keywords used in the search were “shared parenting,” “shared care,” “joint” or “shared physical custody,” “shared” or “dual residence,” and “parenting plans.” Although 85 percent of the studies were published in peer-reviewed academic journals, the remainder was reported in government sponsored reports. The findings of the studies were grouped into five broad categories of child well-being: (1) academic or cognitive outcomes, which include school grades and scores on tests of cognitive development such as language skills; (2) emotional or psychological outcomes, which include feeling depressed, anxious, or dissatisfied with their lives; (3) behavioral problems, which include aggression or delinquency, difficult or unmanageable behavior at home or school, hyperactivity, and drug or alcohol use; (4) physical health and smoking, which also include stress-related illnesses such as stomach aches and sleep disturbances; and (5) quality of father-child relationships, which includes how well they communicate and how close they feel to one another. The following four final conclusions were textually made:

First, shared parenting was linked to a better outcome for children of all ages across a wide range of emotional, behavioral, and physical health measures.

Second, there was no convincing evidence that over-nighting or shared parenting was linked to negative outcomes for infants or toddlers.

Third, the outcomes are not positive when there is a history of violence or when the children do not like or get along with their father.

Fourth, even though shared-parenting couples tend to have somewhat higher incomes and somewhat less verbal conflict than other parents, these two factors alone do not explain the better outcomes for the children.

A second meta-analysis by Professor Hildegunde Suenderhauf (2013) analyzes 50 comparative pieces of research between 1977 and 2013. In this review, the cut-off between sole custody and joint physical custody is at 25 percent of the time spent by each parent (thus, with a lower limit than in the study by Professor Nielsen). In 37 studies (74%), the outcomes were favorable for joint physical custody; in 11 studies (22%), the outcomes included positive effects balanced by some other negative effects; and only in two studies (4%), the outcomes were negative (but further investigations highlighted in this research some important bias).

A corollary to the meta-analysis cited above is another meta-analysis by Professor Richard Warshak, published in

2014 with the endorsement of 110 internationally recognized scientists, focused only on revision of international literature related to shared care for babies aged under 4 years; this meta-analysis grounds on 13 papers published between 1987 and 2010 and concludes literally with these words: “There is no evidence to support postponing the introduction of regular and frequent involvement, including overnights, of both parents with their babies and toddlers” and “In general the results of the studies reviewed in this document are favorable to parenting plans that more evenly balance young children’s time between two homes.” Actually, we do not have much research on this topic (shared parenting for toddlers), but new broad and thorough research on shared-parenting and pre-school children (focused on 3- to 4-year-old children) is in progress in Sweden within the context of the ELVIS Project (coordinated by the Centre for Health Equity Studies) and the first preliminary outcomes would seem to confirm that pre-school children in shared parenting are far better than children in monoparental care (Bergström, 2015).

Between the literature published between 1977 and 2014, we find very few bodies of research apparently against shared parenting. Essentially three: “Ongoing Postdivorce Conflict: Effects on Children of Joint Custody and Frequent Access” (Johnston et al., 1989), “Child-focused and child-inclusive divorce mediation: comparative outcomes from a prospective study of postseparation adjustment” (McIntosh et al., 2008), and “Overnight Custody Arrangements, Attachment, and Adjustment Among Very Young Children” (Tornello et al., 2013). All these studies are burdened by huge bias and important methodological mistakes (Millar and Kruk, 2014; Nielsen, 2014; Poussin, 2016; Warshak, 2014, 2016).

Wide research on the topic of life satisfaction (linked to childhood adversity) was run by seven researchers from seven universities of Sweden, Greenland, Finland, Iceland, the United States, and Denmark. The paper examines differences in life satisfaction among children in different family structures in 36 Western, industrialized countries (n=184,496).

Analyses were based on data from the 2005/2006 Health Behavior in School-Aged Children (HBSC) study, a World Health Organization collaborative cross-national study children living with both biological parents reported higher levels of life satisfaction than children living with a single parent or parent-step-parent.

Children in joint physical custody reported significantly higher levels of life satisfaction than their counterparts in other types of non-intact families.

Controlling perceived family affluence, the difference between joint physical custody families and single mother or mother-stepfather families became non-significant. Difficulties in communicating with parents were strongly associated with lower life satisfaction but did not mediate the relation between family structure and life satisfaction. Children in the Nordic countries characterized by strong welfare systems reported significantly higher levels of life

satisfaction in all living arrangements except in single-father households. Differences in economic inequality between countries moderated the association between certain family structures, perceived family affluence, and life satisfaction (Bjarnason et al., 2012).

In the same sample, impaired communication with both mother and father was significantly less likely in joint physical custody than in other non-intact families. Indeed, impaired communication with the mother was equally prevalent in intact families and joint physical custody families, while impaired communication with the father was in fact less prevalent in joint physical custody than intact families (Bjarnason and Arnarsson, 2011).

Further wide research wanted to examine children's health-related quality of life after parental separation, by comparing children living with both parents in nuclear families to those living in joint physical custody and other forms of domestic arrangements (Bergström et al., 2013).

Investigating a sample from a national Swedish classroom study of 164,580 children aged 12 and 15 years old, the researchers found that living in a nuclear family was positively associated with almost all aspects of well-being in comparison with the children with separated parents. Children in joint physical custody experienced more positive outcomes, in terms of subjective well-being, family life, and peer relations, than children living mostly or only with one parent. For the 12-year-olds, beta coefficients for moods and emotions ranged from -0.20 to -0.33 and peer relations from -0.11 to -0.20 for children in joint physical custody and living mostly or only with one parent. The corresponding estimates for the 15-year-olds varied from -0.08 to -0.28 and from -0.03 to -0.13 on these subscales. The 15-year-olds in joint physical custody were more likely than the 12-year-olds to report similar well-being levels on most outcomes to the children in nuclear families.

Other Swedish research shows that children with non-cohabitant parents experience more psychosomatic problems than those in nuclear families. Those in joint physical custody do, however, report better psychosomatic health than children living mostly or only with one parent (Bergström et al., 2015).

Finally, I recall the Turunen paper published in 2015: the data for this study were from the Surveys of Living Conditions (ULF) from 2001 to 2003, the first years when the survey was accompanied by a child supplement.

The cross-sectional surveys consisted of a nationally representative sample of the Swedish population aged 18–84 years and child supplements with data collected from children aged 10–18 years living in the household of the main respondent. Like other recent studies of emotional outcomes of shared physical custody, this study observed that sharing residence equally after a parental union disruption may not be harmful for children. On the contrary, children in 50/50 shared residence have markedly lower likelihood of experiencing high levels of stress confirming

positive findings on other aspects of emotional well-being.

These findings were then confirmed by the conclusion of another important study where data on 15-year-old adolescents from the 2005/2006 to 2009/2010 Swedish HBSC survey were analyzed using logistic regression: here, the authors found that shared physical custody after marriage breakup seems to constitute a health protective factor for adolescents' health and problem behavior (Åsa et al., 2012).

Concluding note. The causal effect of shared parenting on general wellbeing is more controversial: differently from conflict and parental loss areas, in this field, it may be more difficult to distinguish between selection effect and causal effect of different parenting (shared, sole, etc.) on individual well-being. However, even if it is not completely clear how much the outcomes depend on selection effect (where parents opting for “shared parenting” would be more collaborative, non conflictual, and better care providers than “sole-parenting parents”) or on causal effect (shared parenting really would lead to better outcomes for the children), the sudden and huge increase in shared parenting in Sweden (where joint physical custody increased from 4 percent in 1998 to 28 percent in 2006 and up to 40 percent in 2014, Bergström, 2015) and the observations reported earlier (Buchanan and Maccoby, 1996; Cashmore and Parkinson, 2010; Fabricius et al., 2012; Kline et al., 1989; Melli and Brown, 2008; Nielsen, 2014; Sodermans et al., 2013; Warshak, 2016) that there is no difference between conflict between families in joint physical custody arrangement and families in sole custody and leads us to think that the positive outcomes of shared parenting cannot depend just on selection effect.

The revolutionary dilemma: is divorce with minor children a juridical, a political or finally a public health problem?

There is much evidence of significant biomedical consequences of divorce on child health. The effects can appear after 10, 20, or 30 years and, from a biological and biochemical point of view, also in apparently healthy adults. This issue indicates that this problem should be primarily faced not from a juridical but from a public health point of view. Unfortunately, in most countries, divorce involving minor children is still considered a simple family law problem, and in most European Union Member States, it is the Ministry of Justice (and not Ministry for Childhood or for Health!) that usually manages this kind of topic. As an example of this approach, we recall the answer given by Viviane Reding, at that time European Union (EU) Justice Commissioner, on behalf of the European Commission to European Parliament Vice President Hon. Angelilli:

Table 1. Protection of children's right to co-parenting in case of divorce in different European countries by exact time division.

Section 1	Sweden	Exact time division, >30%
Section 2	Belgium	Exact time division, >20%
Section 3	France, Denmark, Spain	Exact time division, 8%–20%
Section 4	UK, Germany	Exact time division, 3%–8%
Section 5	Romania, Austria, Czech Republic, Slovakia, Italy, Greece, Switzerland, Portugal	Exact time division, <3%

Table 2. Protection of children's right to co-parenting in case of divorce in different European countries by physical shared custody (excluded exact time division).

Physical shared custody <15%	Physical shared custody <30%	Physical shared custody >30%
Italy, Switzerland, Greece, Austria, Germany, Czech Republic, Slovakia, UK, Romania, Portugal	France, Spain	Sweden, Belgium, Denmark

The definition of joint custody belongs to substantive family law. As such, it does not fall within the EU's competence but remains under the sole responsibility of the Member States. This explains why there may be differences in the national systems as regards the definition of joint custody and how it works in practice. (Parliamentary Questions, 2013, E 000713/2013)

Similarly and unfortunately, also the Head of Unit of Civil Justice Policy, on behalf of European Commissioner, answered a question of Vittorio Vezzetti, President of European Platform for Joint Custody Colibri that

The Commission is aware of differences in the national systems and diverging practices when it comes to granting and exercising these rights, where often cultural and societal aspects play an important role. It is nevertheless of the opinion that in decisions concerning children the primary consideration shall be the best interests of the individual child assessed on a case-by-case basis, in line with General Comment No 14 (2013) of the UN Committee on the rights of the child to have his or her best interests taken as a primary consideration. The legal base enshrined in the Treaty² on which the Brussels IIa Regulation is based, gives the Commission the powers to propose measures to “develop judicial cooperation in civil matters having cross-border implications, based on the principle of mutual recognition of judgments and of decisions in extrajudicial cases.” The objective of the reform of the Regulation is therefore to enhance mutual trust in the fairness of parental responsibility proceedings in the Member States and thereby to ensure the smooth functioning of the Brussels IIa Regulation to the benefit of parents and their children. In this context, the Commission does not intend to unify the definition of the best interests of the child. (Official Question to European Commissioner for Justice, 2016)

This wrong and sectional approach leads to significant and unjustifiable differences between the Member States,

and so the “paramount interest of the child” changes when simply crossing a border as Vittorio Vezzetti has claimed by Office of High Commissioner for Human Rights, European Commissioner for Justice, European Commissioner for Health, European Parliament, and Council of Europe (International Council on Shared Parenting (ICSP), 2016; Official Question to European Commissioner for Health, 2016; Official Question to European Commissioner for Justice, 2016; Parliamentary Questions, 2014, E-005595-14; Vezzetti, 2014; Vezzetti, 2015, 2016; see Tables 1 and 2 and Figure 1).

Conclusion

This review confirms that judgments of Family Courts can have a huge influence on human health as they have a huge influence on the probabilities of parental loss (varied according different jurisprudences) and other childhood adversities (like inadequate parenting and long-term conflict). The opinion of the author is that it is necessary to make practices more harmonized such as in the medical world where shared and common guidelines usually exist (inside which the operator can work according to a case-by-case method). Considering the consequences on children's psychological and physical health, this might be possible only by replacing the dominant “sectionalist” legal language with a more universal scientific language allowing all children to have an equal or adequate right to health (as requested by most national Constitutions and by EU's Charter of Fundamental Rights) and overpassing the Cartesian wall between Science and Right (Vezzetti, 2010).

Finally, the consequences of loss of contact between one of the parents and the child/children will result in a heavy burden for future worldwide generations.

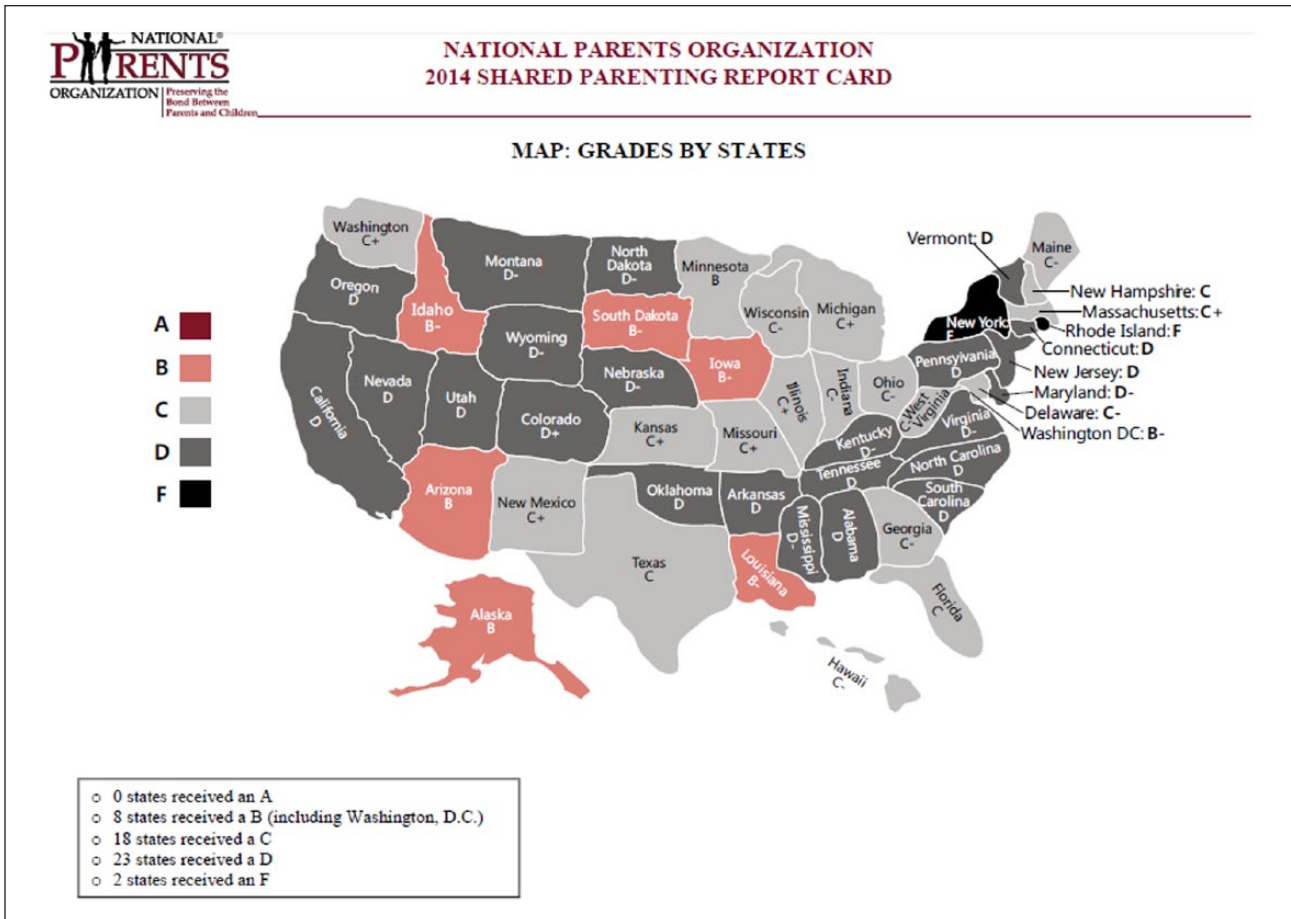


Figure 1. Shared Parenting Report Card 2014 by National Parents Organization.
https://nationalparentsorganization.org/docs/2014_Shared_Parenting_Report_Card%2011-10-2014.pdf

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