**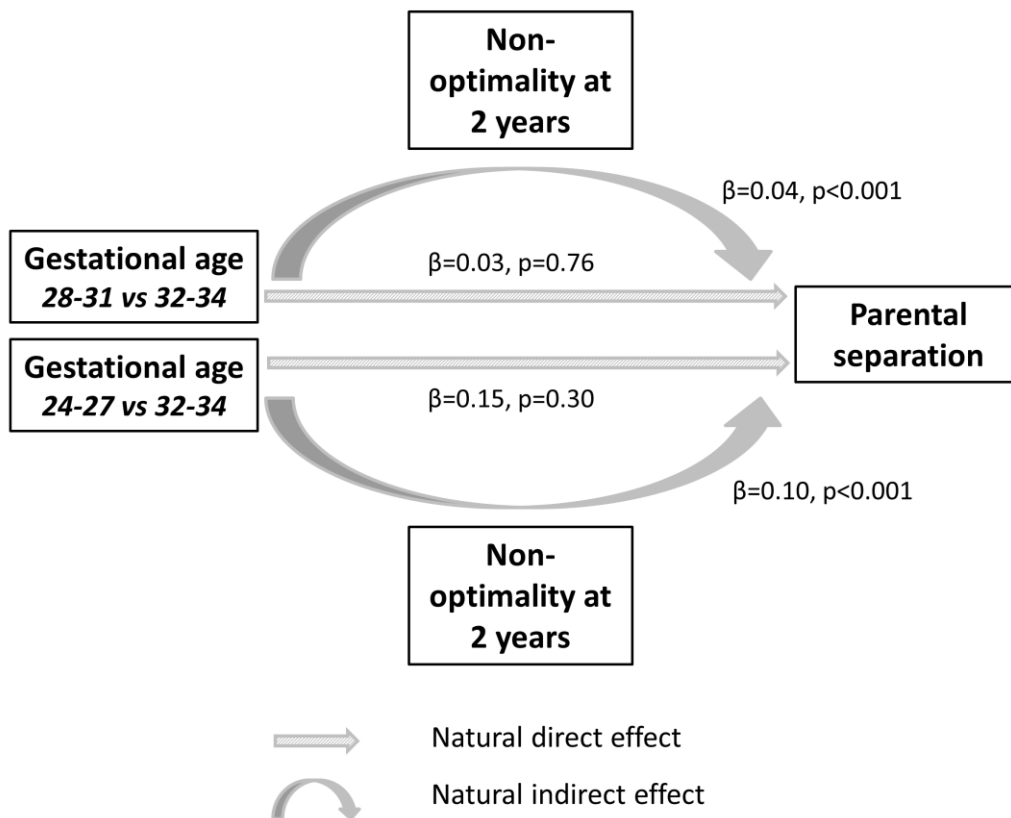Supplementary Figure 1.** Decomposition of the effect of low gestational age on the risk of parental separation into a direct effect and an indirect effect mediated by the neurodevelopment of preterm infants (non-optimality at two years). This mediation model was adjusted for gender, multiple pregnancy, Z-score of birthweight, socioeconomic level, social security benefits for those with low incomes, and urbanicity of the residential municipality.

**Supplementary Table 1.** Incidence risks and incidence rates of parental separation in preterm infants population according to the perinatal characteristics of the child, the socio-economic level of the family and the urbanicity of the residential municipality (n=5,732).

| Variable | Category | Incidence risk of parental separation (N events/N at risk) x 100 | Incidence rate of parental separation for 1000 children-year | P value** |
|---|---|---|---|---|
| Gestational age (weeks) | 32–34 | 9.6 | 22.6 | 0.030 |
| | 28–31 | 9.9 | 24.1 | |
| | 24–27 | 13.0 | 31.6 | |
| Optimality at 2 years* | Yes | 9.2 | 21.5 | < 0.001 |
| | No | 13.4 | 34.2 | |
| Gender | Female | 9.6 | 23.0 | 0.450 |
| | Male | 10.3 | 24.5 | |
| Multiple pregnancy | No | 10.2 | 24.3 | 0.460 |
| | Yes | 9.6 | 22.9 | |
| Z score of birthweight | <-1 | 10.3 | 24.3 | 0.570 |
| | -1 to 0 | 10.5 | 25.3 | |
| | 0 to 1 | 9.2 | 21.8 | |
| | >1 | 9.6 | 23.5 | |
| Socio-economic level | Intermediate | 10.8 | 26.7 | < 0.001 |
| | High | 7.5 | 16.4 | |
| Social security benefits due to low income | No | 7.6 | 17.7 | < 0.001 |
| | Yes | 27.4 | 73.6 | |
| Urbanicity | Rural | 6.6 | 15.2 | < 0.001 |
| | Urban | 12.0 | 29.1 | |

*Children with a non-optimal neuromotor and/or psychomotor assessment and/or sensorial disability at two years were considered as non-optimal.

**log-rank test

**Supplementary Table 2.** Adjusted associations between the risk of non-optimal neurodevelopment at two years and gestational age with adjustment variables for preterm infants born between 2005 and 2013 followed in the LIFT cohort (n=5,732).

| Variable | Category | N (%) | Adjusted OR [95%CI] |
|---|---|---|---|
| Gestational age (weeks) | 32–34 | 3,494 (61.0) | 1 |
| | 28–31 | 1,730 (30.2) | 2.06 [1.78, 2.39] |
| | 24–27 | 508 (8.9) | 4.23 [3.43, 5.20] |
| Gender | Female | 2,640 (46.1) | 1 |
| | Male | 3,092 (53.9) | 1.38 [1.2, 1.59] |
| Multiple pregnancy | No | 3,617 (63.1) | 1 |
| | Yes | 2,115 (36.9) | 0.94 [0.82, 1.09] |
| Z score of birthweight | <-1 | 1,378 (24.0) | 1 |
| | -1 to 0 | 2,044 (35.7) | 0.73 [0.61, 0.87] |
| | 0 to 1 | 1,787 (31.2) | 0.72 [0.6, 0.87] |
| | >1 | 523 (9.1) | 0.99 [0.77, 1.26] |
| Socio-economic level | Intermediate | 4,254 (74.2) | 1 |
| | High | 1,478 (25.8) | 0.72 [0.61, 0.85] |
| Social security benefits (SSB) due to low income | No | 5,031 (87.8) | 1 |
| | Yes | 701 (12.2) | 1.31 [1.07, 1.59] |
| Urbanicity | Rural | 2,104 (36.7) | 1 |
| | Urban | 3,628 (63.3) | 0.90 [0.78, 1.04] |

OR: odds ratio; CI: confidence interval.

**Supplementary Table 3.** Crude and adjusted associations between the risk of parental separation and neurodevelopment of preterm infants (optimality at two years) with adjustment variables and interaction term between optimality at two years and social security benefits due to low income (n=5,732).

| Variable | Category | N (%) | Adjusted HR [95% CI] |
|---|---|---|---|
| Optimality at 2 years* | Yes | 4,636 (80.9) | 1 |
| | No | 1,096 (19.1) | 1.27 [0.99, 1.63] |
| Gender | Female | 2,640 (46.1) | 1 |
| | Male | 3,092 (53.9) | 1.07 [0.91, 1.26] |
| Multiple pregnancy | No | 3,617 (63.1) | 1 |
| | Yes | 2,115 (36.9) | 0.96 [0.81, 1.14] |
| Z score of birthweight | <-1 | 1,378 (24.0) | 1 |
| | -1 to 0 | 2,044 (35.7) | 1.10 [0.89, 1.36] |
| | 0 to 1 | 1,787 (31.2) | 0.97 [0.77, 1.21] |
| | >1 | 523 (9.1) | 1.04 [0.76, 1.44] |
| Socio-economic level | Intermediate | 4,254 (74.2) | 1 |
| | High | 1,478 (25.8) | 0.64 [0.52, 0.79] |
| Social security benefits (SSB) due to low income | No | 5,031 (87.8) | 1 |
| | Yes | 701 (12.2) | 3.27 [2.65, 4.04] |
| Urbanicity | Rural | 2,104 (36.7) | 1 |
| | Urban | 3,628 (63.3) | 1.80 [1.49, 2.19] |
| Optimality at 2 years * SSB | Yes * No | 4,102 (71.6) | 1 |
| | No * Yes | 167 (2.9) | 1.52 [1.03, 2.23] |

HR: hazards ratio; SSB: social security benefits; CI: confidence interval.

*Children with a non-optimal neuromotor and/or psychomotor assessment and/or sensorial disability at two years were considered as non-optimal.

**Supplementary Table 4.** Adjusted associations between the risk of parental separation occurring from the 24-month visit and neurodevelopment of preterm infants (optimality at two years) with adjustment variables (n=5,511). In this analysis, the separations occurring between the 6-month and the 18-month visit were excluded.

| | Category | N (%) | Adjusted HR [95% CI] |
|---|---|---|---|
| Optimality at 2 years* | Yes | 4,477 (81.2) | 1 |
| | No | 1,034 (18.8) | 1.49 [1.17, 1.91] |
| Gender | Female | 2,549 (46.3) | 1 |
| | Male | 2,962 (53.7) | 0.98 [0.79, 1.21] |
| Multiple pregnancy | No | 3,479 (63.1) | 1 |
| | Yes | 2,032 (36.9) | 0.90 [0.72, 1.13] |
| Z score of birthweight | <-1 | 1,326 (24.1) | 1 |
| | -1 to 0 | 1,952 (35.4) | 1.01 [0.77, 1.32] |
| | 0 to 1 | 1,729 (31.4) | 0.98 [0.74, 1.30] |
| | >1 | 504 (9.1) | 1.02 [0.68, 1.54] |
| Socio-economic level | Intermediate | 4,068 (73.8) | 1 |
| | High | 1,443 (26.2) | 0.67 [0.52, 0.87] |
| Social security benefits (SSB) due to low income | No | 4,903 (89.0) | 1 |
| | Yes | 608 (11.0) | 3.01 [2.38, 3.81] |
| Urbanicity | Rural | 2,054 (37.3) | 1 |
| | Urban | 3,457 (62.7) | 1.82 [1.43, 2.32] |

HR: hazards ratio; CI: confidence interval.

*Children with a non-optimal neuromotor and/or psychomotor assessment and/or sensorial disability at two years were considered as non-optimal.

**Supplementary Table 5.** Adjusted associations between the risk of parental separation and neurodevelopment of preterm infants (optimality at two years) with adjustment variables after imputation of missing values (13 infants with weight at birth missing and 990 infants with neurodevelopmental outcome at two years missing) using the multiple imputation method (n=6,732).

| Variable | Category | Adjusted HR [95% CI] |
|---|---|---|
| Optimality at 2 years* | Yes | 1 |
| | No | 1.45 [1.21, 1.73] |
| Gender | Female | 1 |
| | Male | 1.06 [0.91, 1.24] |
| Multiple pregnancy | No | 1 |
| | Yes | 0.97 [0.83, 1.14] |
| Z score of birthweight | <-1 | 1 |
| | -1 to 0 | 1.06 [0.87, 1.29] |
| | 0 to 1 | 0.92 [0.74, 1.13] |
| | >1 | 0.98 [0.72, 1.33] |
| Socio-economic level | Intermediate | 1 |
| | High | 0.68 [0.56, 0.82] |
| Social security benefits due to low income | No | 1 |
| | Yes | 3.91 [3.32, 4.60] |
| Urbanicity | Rural | 1 |
| | Urban | 1.81 [1.51, 2.18] |

HR: hazards ratio; CI: confidence interval.

*Children with a non-optimal neuromotor and/or psychomotor assessment and/or sensorial disability at two years were considered as non-optimal.

**Supplementary Table 6.** Crude and adjusted association between the neurodevelopment of preterm infants and the risk of parental separation. Adjustment was made on perinatal characteristics of the infants, the socio-economic level of the family, and the urbanicity of the residential municipality. Only one infant from each twins' pair was kept in the analyses (n=3,654).

| | Category | N (%) | Adjusted HR [95% CI] |
|---|---|---|---|
| Optimality at 2 years* | Yes | 2,919 (79.9) | 1 |
| | No | 735 (20.1) | 1.39 [1.10, 1.74] |
| Gender | Female | 1,676 (45.9) | 1 |
| | Male | 1,978 (54.1) | 1.09 [0.89, 1.33] |
| Multiple pregnancy | No | 2,763 (75.6) | 1 |
| | Yes | 891 (24.4) | 0.90 [0.71, 1.15] |
| Z score of birthweight | <-1 | 869 (23.8) | 1 |
| | -1 to 0 | 1,283 (35.1) | 1.08 [0.84, 1.39] |
| | 0 to 1 | 1,147 (31.4) | 0.84 [0.64, 1.10] |
| | >1 | 355 (9.7) | 0.95 [0.64, 1.40] |
| Socio-economic level | Intermediate | 2,705 (74) | 1 |
| | High | 949 (26) | 0.72 [0.56, 0.92] |
| Social security benefits (SSB) due to low income | No | 3,153 (86.3) | 1 |
| | Yes | 501 (13.7) | 3.48 [2.82, 4.29] |
| Urbanicity | Rural | 1,297 (35.5) | 1 |
| | Urban | 2,357 (64.5) | 1.81 [1.43, 2.31] |

HR: hazards ratio; CI: confidence interval

* Infants with a non-optimal neuromotor and/or psychomotor assessment and/or sensorial disability at two years were considered as non-optimal.

**Supplementary Table 7.** Comparison of the infants born <35 weeks between 2005 and 2011 still followed at the 60-month visit (n=3,295) and those lost to follow-up between the 24-month and the 60-month visit (n=1,518).

| Variable | Category | Children still followed at the 60-month visit (n=3295) | Children lost to follow-up between the 24-month and the 60-month visit (n=1518) | P value |
|---|---|---|---|---|
| Parental separation | Living together | 2,868 (87.0) | 1,309 (86.2) | 0.469 |
| | Separated | 427 (13.0) | 209 (13.8) | |
| Gestational age (weeks) | 32–34 | 2,025 (61.5) | 949 (62.5) | 0.772 |
| | 28–31 | 978 (29.7) | 440 (29.0) | |
| | 24–27 | 292 (8.9) | 129 (8.5) | |
| Optimality at 2 years* | Yes | 2,719 (82.5) | 1,190 (78.4) | < 0.001 |
| | No | 576 (17.5) | 328 (21.6) | |
| Gender | Female | 1,507 (45.7) | 693 (45.7) | 0.982 |
| | Male | 1,788 (54.3) | 825 (54.3) | |
| Multiple pregnancy | No | 2,063 (62.6) | 949 (62.5) | 0.976 |
| | Yes | 1,232 (37.4) | 569 (37.5) | |
| Z score of birthweight | <-1 | 816 (24.8) | 357 (23.6) | 0.192 |
| | -1 to 0 | 1,156 (35.1) | 579 (38.2) | |
| | 0 to 1 | 1,030 (31.3) | 444 (29.3) | |
| | >1 | 291 (8.8) | 135 (8.9) | |
| Socio-economic level | Intermediate | 2,318 (70.3) | 1,191 (78.5) | < 0.001 |
| | High | 977 (29.7) | 327 (21.5) | |
| Social security benefits due to low income (SSB) | No | 2,864 (86.9) | 1,292 (85.1) | 0.099 |
| | Yes | 431 (13.1) | 226 (14.9) | |
| Urbanicity | Rural | 1,221 (37.1) | 550 (36.2) | 0.604 |
| | Urban | 2,074 (62.9) | 968 (63.8) | |

*Children with a non-optimal neuromotor and/or psychomotor assessment and/or sensorial disability at two years were considered as non-optimal.