

Expanded Computing Package for the Own-Children Method of Fertility Estimation and Extensions of It

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Own-Children Methodology

- Applicable to censuses and household surveys
- **Needed:** Census or survey question on relationship to head of household or householder.
- Children are first matched to mothers within households (computer algorithm)
 - Own children = matched children
 - Non-own children = unmatched children
- **Desirable but not needed:** Matching is more accurate if also know number of children ever born and/or number of children still living

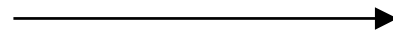
Logic of own-children method of fertility estimation (example)

Census (2000)

1997

$C_{3,27}(2000)$

Reverse



Survival

$B_{24}(1997)$

$W_{27}(2000)$

Reverse



Survival

$W_{24}(1997)$

Then

$$F_{24}(1997) = \frac{B_{24}(1997)}{W_{24}(1997)}$$

Calculate TFR from ASFRs (F_a)

- $TFR = 5 \sum F_a$

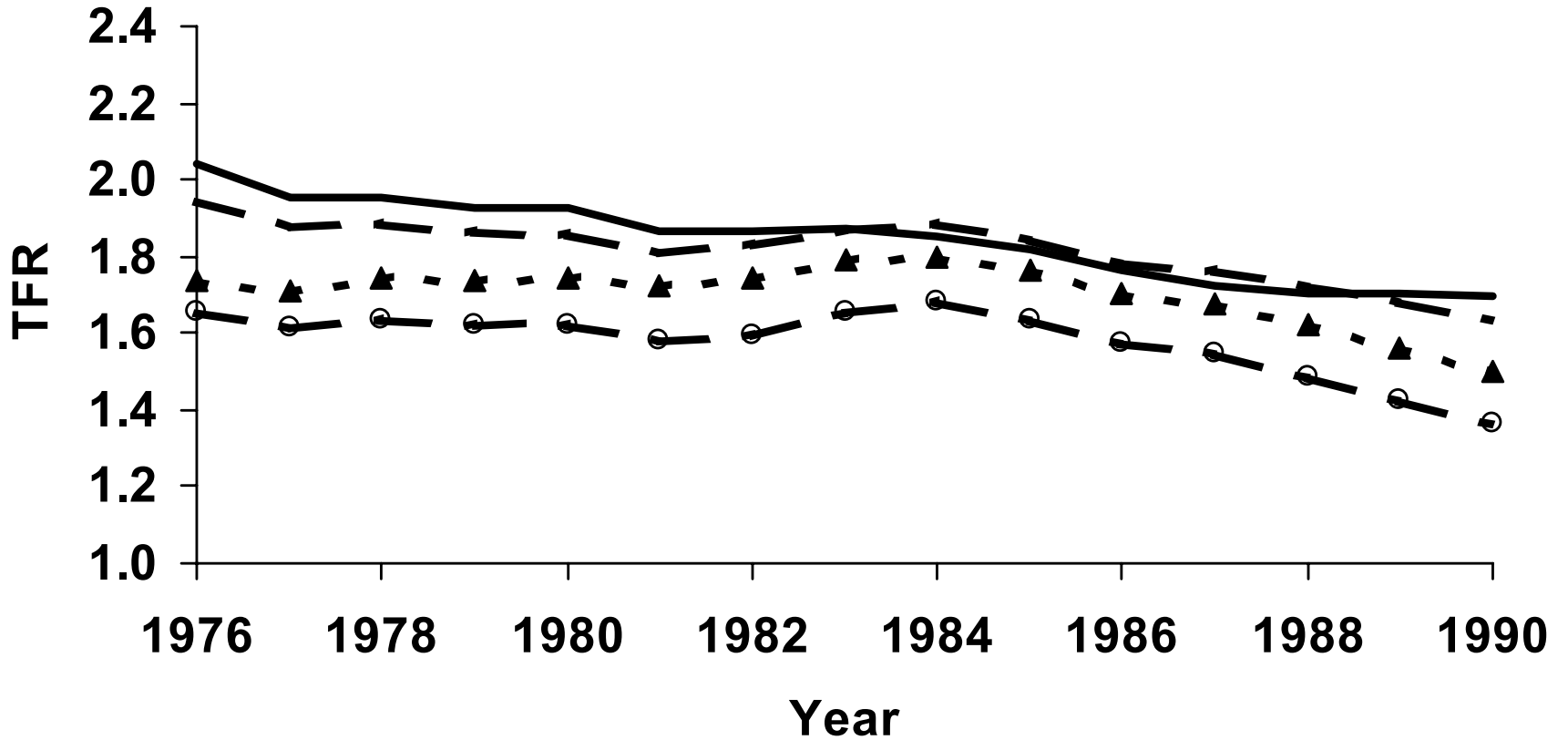
where the summation ranges over 5-year age groups

- Estimates are obtained for each of the 15 years before the census or survey

TFR estimates by characteristics

- Characteristic should not change after age 15
- Education changes some
 - If fertility is very low at 15-19, change in education over this age range has little effect on TFR estimates by education

TFR estimates derived from 1990 Census of Japan



— Jr. High — - Sr. High - ▲ - Jr. College —○ - University

Extension: Fertility estimates by duration since first marriage

- **Additionally needed:** Census or survey question on age at first marriage or year of first marriage asked of all women up to age 65
- **Desirable but not needed:** Matching is more accurate if also know number of children ever born and/or number of children still living.
- F_d : Duration-specific fertility rate

Total ever-marital fertility rate (TEMFR) calculated from the F_d

- $TEMFR_d = 5 \sum F_d$
 - Summed over 5-year duration groups out to duration 20-25
- This is better than the TMFR calculated from age-specific marital fertility rates
 - $TMFR = 5 \sum F_{ma}$
 - Summed over 5-year age groups from 15-19 to 45-49

Total ever-marital fertility rate (TEMFR) calculated from the F_d (cont.)

- Again one gets fertility estimates for each of the 15 years before the survey
- Again one gets fertility estimates by characteristics

Another extension: Period parity progression ratios (PPPRs)

- **Needed:** Census or household survey question on number of children ever born asked of all women up to age 65
- **Needed if want PPPR from birth to marriage and PPPR from marriage to first birth:** Question on age at first marriage or year of first marriage, asked of all women up to age 65.
 - Without this question, one can still calculate a PPPR from the woman's own birth to her first birth.)
- **Desirable but not needed:** Additional question on number of children still living (get slightly more accurate estimates of PPPRs)

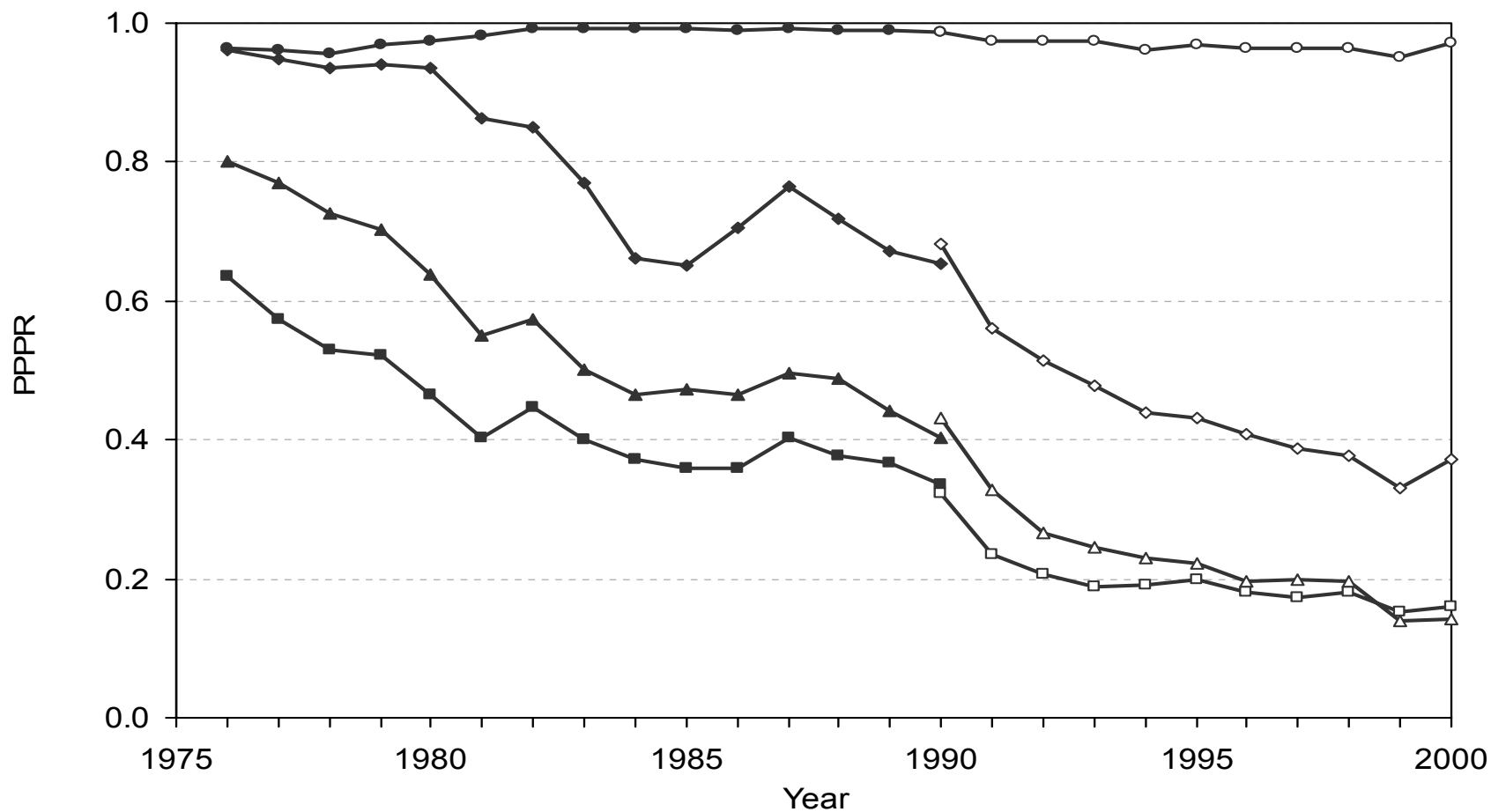
PPPRs (cont.)

- Start with incomplete birth histories based on own children
- Missing births = CEB – own children
- Hot-deck in the missing births (corresponding to dead children and children no longer living with mother)

PPPRs (cont.)

- Once one has the reconstructed (complete) birth histories, it is easy to compute PPPRs
- One can also compute a TFR_{pppr} from the PPPRs
- One gets estimates (by characteristics, if desired) for each of the 15 years before the census or survey

Trends in period parity progression ratios derived from China's 1990 and 2000 censuses



p_B , 1990 ●— p_1 , 1990 ◆— p_2 , 1990 ▲— p_3 , 1990 ■—
 p_B , 2000 ○— p_1 , 2000 ◇— p_2 , 2000 △— p_3 , 2000 □—

About the computing package

- Basic own-children program is already packaged and easy to use (but we will incorporate some improvements)
- The two extensions (F_d and PPPRs) are already programmed, but the programs must be adapted to each census, and the adaptation is not easy.
 - When packaged, the extensions of the OWCH method will also be easy to use

Advantages of the package

- Fertility estimates by characteristics (can't get from vital registration)
- Estimates for small areas (when package is applied to a census)
 - Caution: migration can be a problem
- Inexpensive (data already collected for other purposes)

Availability of the package



- The package will be ready one or two years from now.

Final bit of salesmanship!



- Lot to be gained from census questions on:
 - Age at marriage (or year of marriage)
 - Number of children ever born
- These questions need to be asked of women up to age 65



End