# Journal of Family Issues

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>> Version of Record - Apr 20, 2011

OnlineFirst Version of Record - Dec 17, 2010

What is This?

# Nonresponse of Secondary Respondents in Multi-Actor Surveys: Determinants, Consequences, and Possible Remedies

## Matthijs Kalmijn[1] and Aart C. Liefbroer[2]

## Abstract

Multi-actor survey data are highly valuable for answering questions about family relations, but the collection of such data is complicated by nonresponse among secondary (nonresident) respondents. Little is known, however, about the degree to which nonresponse of secondary respondents is selective and about the degree to which selective nonresponse biases substantive findings. Using a large representative survey, we analyze nonresponse of nonresident adult children of primary respondents. Nonresponse appears strongly related to characteristics of the parent–child relationship and to characteristics of both parents and children. Consequences are examined for three dependent variables: children's attitudes, children's support giving to parents, and children's well-being. Heckman models, which correct for sample selection bias, show that selective response hardly biases the substantive estimates.

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Many substantive questions in the field of family studies focus on relationships between family members. Examples are questions about the influence of parents on the values, behaviors, and developmental outcomes of their adult children (Glass, Bengtson, & Chorn Dunham, 1986; Thornton, Axinn, & Hill, 1992); questions about the influence of children's behavior on their parent's health and well-being (Umberson, 1989); and questions about the exchange of social and instrumental support between generations (Silverstein, Conroy, Wang, Giarrusso, & Bengtson, 2002; Van Gaalen & Dykstra, 2006). These questions can only be answered with data that include information on multiple family members. Household surveys generally contain data on family members but they do not provide information on family members who are not living with each other. To collect such data in the context of surveys, two options have been available.

One frequently used option is asking respondents to provide information on their parents and children. Such proxy reports are believed to be fairly reliable for concrete and objective characteristics, such as marital history or education and occupation (Axinn, Thornton, Yang, Young-DeMarco, & Xie, 2002). For more subjective characteristics, such as values, beliefs, feelings, and evaluations, proxy reports are generally believed to be less reliable (Eiser & Morse, 2004). For example, respondents may not know the feelings of their family members well enough, and their perceptions of their family members' values may be biased by their own values.

A second option is collecting information among family members directly. For example, the parents and children of respondents can be interviewed or can be approached with a mail questionnaire. In these cases, the respondents are usually called "primary respondents" and their family members are called "secondary respondents." This design leads to more reliable information on family members, especially on their subjective characteristics. Few surveys, however, have collected such "multi-actor" data. There are a number of exceptions, where data on multiple generations have been collected in the context of large representative surveys, for example, the Longitudinal Study of Generations in Southern California (Bengtson, Biblarz, & Roberts, 2002), the Intergenerational Study of Parents and Children in Detroit (Thornton et al., 1992), and the National Survey of Families and Households (Sweet, Bumpass, & Call, 1988). Nonetheless, multi-actor survey data remain the exception rather than the rule.

Although collecting data among multiple family members yields more reliable information than proxy reports, multi-actor data have other methodological problems. One important problem is that the level of nonresponse of family members usually is substantial. More important, whether family

members will respond can be expected to depend on individual characteristics of the family members involved as well as on characteristics of their mutual relationship. One possible consequence of selective nonresponse of family members is bias in descriptive statistics on family relationships. For example, better family relationships may be overrepresented in multi-actor data, which would lead to an overly rosy picture of family relationships. A second possible consequence is that estimates of causal effects can be biased. For example, estimates of the influence of parents on children may be overstated if cooperation of children depends on the degree of value similarity between primary and secondary respondents. Whereas descriptive statistics can often be corrected by weighting the data using information provided by the primary respondent, estimates of effects are more difficult to repair.

Little is known, however, about the degree of selectivity and even less is known about the consequences of selectivity. There is a long and vibrant tradition of research on survey nonresponse (Abraham, Maitland, & Bianchi, 2006; Groves, 2006), but the causes and consequences of nonresponse in multi-actor data have less often been studied. The family studies that we know of that have used the strengths of multi-actor surveys have not yet systematically addressed the problem of (selective) nonresponse in their analyses (Aquilino, 1999; Silverstein et al., 2002; Thornton, 1991). In this article, we examine nonresponse of secondary family members in a large nationally representative face-to-face survey. We focus on the response of adult nonresident children of the primary respondent and we answer the following questions: (a) To what extent is the response of adult nonresident children selective? (b) To what extent does nonresponse of adult children affect estimates of causal effects in substantive family research? As a by-product of our analyses, we show how standard statistical models—that is, Heckman's models for sample selection bias—can be used to correct for selective nonresponse.

## Background

### Selectivity of Nonresponse

Whether adult nonresident children of primary respondents participate in a multi-actor study depends on two issues. First, the primary respondents must give permission to contact their children. Second, given that this permission is granted, the children must be willing to participate. The overall response rate of adult nonresident children can thus be viewed as the product of two probabilities: the probability that the primary respondent gives permission to

contact the child and the probability that the child responds given that permission was granted.

We consider four sets of characteristics that we believe may influence response: social and demographic characteristics of the children, social and demographic characteristics of the parents, characteristics of the relationship between parent and child, and experiences during the interview.

Social and demographic characteristics of the children (i.e., the secondary respondents) seem the most obvious source of variation in response. After all, the response of children is very much similar to the initial response in survey research. In surveys, nonresponse of primary respondents has been shown to depend on characteristics such as sex, age, marital status, education, urbanization, and ethnicity (Abraham et al., 2006; Groves, Cialdini, & Couper, 1992; Groves & Couper, 1998). Participation in surveys is generally lower among men, among the young and the very old, among people who are single, among the lower educated, among urban residents, and, in the Netherlands, among non-Western immigrants (Centraal Bureau voor de Statistiek, 2005). We thus expect that these social and demographic characteristics of children will also affect the response of children in their role as secondary respondents.

Social and demographic characteristics of the parents (i.e., the primary respondents) may also affect response because it is the parents who have to give permission first. Granting permission to contact one's children may depend on the same characteristics that affect initial nonresponse of primary respondents. For example, lower educated persons are less likely to participate in a survey but if they do, they may also be less likely to grant permission to contact their family members. It is possible that these effects are lower than they are on initial response because we only observe parents who participate in a survey. We further expect that characteristics of parents will primarily affect response via permission (of the parent), whereas characteristics of children will primarily affect response via participation (of the child).

Response may also depend on factors that are specific to multi-actor data. One of the more common assumptions in multi-actor research is that response of family members depends on the relationship with the primary respondent. Primary respondents may be less willing to give permission to contact the child if their relationship with the child is troubled. Parents may feel ashamed about their troubled relationship with the child and may not want the interviewer to delve into that relationship. When relationships are very poor, the parent may also not know the address of the child, which will further contribute to nonresponse. Relationship characteristics may also influence participation by the child, even when permission is granted. If the relationship is troubled, the child may be less willing to participate even when the parent has

given permission. In such a situation, the child may regard participation in the survey in part as doing something for the parent and if the relationship is poor, he or she may not be willing to do this.

A final set of factors that could be potentially important in granting permission to contact children consists of characteristics of the interview (Behr, Bellgardt, & Rendtel, 2005; Fitzgerald, Gottschalk, & Moffitt, 1998; Lynn, Buck, Burton, Jackle, & Laurie, 2005). In panel research, it is argued that the more positive the respondents' experiences were during the initial interview, the more likely it is that the respondent will participate in a subsequent wave of the panel. In this study, we examine if such experiences also affect the permission to contact children. If the experience of the primary respondent was negative, he or she may be less willing to give permission to contact the child. Experiences of the parent during the initial interview may influence their children's willingness to participate as well. For instance, if experiences were negative, the parent may be less likely to encourage the child to complete a questionnaire when the child asks the parent about the survey.

## Consequences of Selective Nonresponse

Our second research question is, To what extent does nonresponse of adult children affect estimates of causal effects in family research? For answering this question, we need to consider first to what extent the nonresponse of adult children is selective. One extreme case is that nonresponse is occurring completely at random. This means that nonresponse is unrelated to the scores of parents and children on the independent ($X$) variables and unrelated to the scores of parents and children on the dependent ($Y$) variables given the influence of $X$. If so, there seems to be little reason to expect bias in the estimates of causal effects. However, the situation is different if nonresponse is related to the scores of parents and children on the $X$ variables or to the scores on both the $X$ and the $Y$ variables. The former situation is called "missing at random" (MAR) and the latter "missing not at random" (MNAR). To the extent that our $X$ variables are available from the parent, these can be included in a nonresponse analysis and it can explicitly be tested whether nonresponse is related to (some of) the $X$ variables of interest. This is usually not possible for the $Y$ variable(s) of interest, however, as these have to be measured among the children and we do not have the scores of children who do not respond. Therefore, one is often in considerable doubt about whether one's estimates of causal effects are biased. To overcome this problem, a method is needed that (a) allows us to test whether nonresponse is related to the dependent variable of interest and (b) if so, to correct for this bias.

A promising method to do so is Heckman's model for sample selection (Berk & Subhash, 1982; Fu, Winship, & Mare, 2004; Heckman, 1979; Winship & Mare, 1992). The basic idea behind Heckman's sample selection model is surprisingly simple and elegant. In a first step, whether or not children have responded is modeled with a probit model (selection equation). Based on the results of this probit model, one can calculate a score that indicates a child's expected propensity to respond (called Mill's lambda). This score is calculated for all parent–child dyads, hence, also for the dyads in which the child actually did respond. In a second step, this score is added to a "standard" regression analysis predicting the substantive variable of interest (substantive equation). This regression analysis is done only for the parent–child dyads in which the child responded. The effect of Mill's lambda tells us whether the *Y* variable of interest is related to the nonresponse pattern (given the influence of *X*). Because this response propensity is included in the multivariate regression model, it automatically also corrects the effects of other *X* variables of interest. To identify the model statistically, at least one variable needs to be included in the selection equation that is not in the substantive equation. To assess the fruitfulness of the Heckman sample selection method, we will apply it to three substantive research issues and we will compare results from applying this model to results from standard (ordinary least squares [OLS]) regression models.

## Substantive Models

The first substantive issue concerns the degree to which the attitudes of parents affect the attitudes of children toward family issues (Glass et al., 1986; Moen, Erickson, & Dempster-McClain, 1997). We examine the effect of the primary respondent's (i.e., the parent's) attitude on the child's attitude on the same topic while controlling for a range of relevant parent and child characteristics. We expect that there will be positive effects of attitudes of parents on attitudes of children, but the question is to what extent these effects are biased by selective nonresponse of children. One could expect that the effects are overestimated because some studies show that good relationships generally have a higher degree of value similarity (Roberts & Bengtson, 1990). Other studies, however, suggest that there is no association in this respect (Noordhuizen & Kalmijn, 2009). Note that we realize that the influence may also run from children's attitudes to parents' attitudes, but the cross-sectional nature of our data does not permit us to examine the direction of the effect. For our conclusions about the impact of selective nonresponse, the inability to establish the causal direction is less problematic.

The second substantive issue concerns the determinants of the support that adult children give to their parents (Silverstein et al., 2002; Silverstein, Parrott, & Bengtson, 1995). Following earlier studies, we examine a range of determinants of support giving (Eggebeen & Hogan, 1990; Klein Ikkink, Van Tilburg, & Knipscheer, 1999; Roberts & Bengtson, 1990; Silverstein et al., 1995). Based on these earlier studies, we expect that support is more likely when (a) there is more frequent contact with the parent, (b) when the child evaluates the relationship as more positive, (c) when the child receives more support from the parent, and (d) when there are fewer conflicts with the parent. Note that these characteristics of the relationship overlap, but the degree of correspondence is not very strong. For example, authors have shown that quality evaluations are only moderately correlated with the degree of conflict (Van Gaalen & Dykstra, 2006). Our main question is to what extent effects on intergenerational support are biased by selective response of children. Because the variance in the independent variables—in particular the measures of contact frequency and perceived quality—can be attenuated by selective nonresponse, one would expect that effects on support giving are underestimated.

Our third and final issue concerns the influence of the quality and content of the parent–child relationship on the well-being of adult children, a topic that has not often been studied. Given the importance of the parent–child bond, it can be expected that children's well-being is negatively affected by strains in the parent–child relationship. Although this hypothesis can in principle also be tested with individual data, multi-actor data provide a stronger test. If one were to measure the quality of the relationship as perceived by the child, the effect of relationship quality on well-being may be overestimated. The reason is that a negative evaluation of the relationship with the parents by the child could be the result rather than the cause of a child's low level of well-being. For example, depression or personal distress may lead people to evaluate a given relationship in a more critical, more negative fashion (Grote & Clark, 2001). Hence, if one uses reports of the parents on the relationship with the child, rather than reports of the child, this bias will not occur. As with our earlier examples, selective nonresponse could influence the estimate of this relationship.

## Method

We use data from the Netherlands Kinship Panel Study ([NKPS]; Dykstra et al., 2004). The NKPS is based on a random sample of addresses in the Netherlands. Computer-assisted personal interviewing (CAPI) interviews

were held with 8,161 primary respondents aged 18 to 79 years. At the end of the interview, primary respondents received a self-completion questionnaire.

During the interview, a list was compiled of all living close family members (parents, children, and siblings) of the primary respondent. Near the end of the interview, a subset of these family members was randomly selected: one of the parents, one sibling, and two children who were at least 15 years old. We asked the primary respondent to give permission to send a written questionnaire to these family members. All family members within a category were chosen at random and in the case of nonresponse, no alternative family member was chosen.

If permission was granted, the interviewer asked for the full name and address of the family member. We provided the primary respondent the option to contact the family member first if he or she wished to do so. In these cases, primary respondents were recontacted to provide the name and address at a later time. The questionnaire was sent by the fieldwork agency with a return envelop and postage. If no questionnaire was received, two reminders were sent. The second reminder included the questionnaire again.

In this article, we focus on the response of the children. If two children were selected, both children are included in the analysis. Because this introduces dependency among the error terms, we corrected the standard errors in the regression models for clustering. The current sample is limited to parents with at least one biological child who lives independently. The number of primary respondents (i.e., parents) with nonresident children was 2,895 and the number of nonresident children was 4,940 (this includes the nonresponse).

## Design and Measurement of the Response Analysis

Response is analyzed with logistic regression models for three different probabilities: (a) whether the parent gave permission, (b) whether the child responded, given that the parent gave permission (what we call "participation"), and (c) whether the child responded, regardless of whether the parent gave permission (what we call "overall response"). Overall response is a product of (a) and (b).

Six sets of independent variables are used in these models. Detailed information on the variables is included in the appendix, including their source (main primary respondent, child, interviewer), description, mean, and standard deviation.

*Social and demographic characteristics*. These include the child's and parent's gender, level of urbanization of the place of residence, level of education, and

marital status. We include the age of the child but not the age of the parent since the ages of parents and children are highly correlated ($r = .85$). Ethnicity of the parent was also included. The child's ethnicity is not included because it overlaps with the ethnicity of the parent. All information on social and demographic characteristics is taken from the interview with the parent.

*Relationship characteristics*. Information includes the frequency of face-to-face and other contacts, an assessment of the quality of the relationship, support given and received from the child, financial transfers given to the child, and the frequency of conflict. As these variables are used to predict whether or not the child responds, the measures were taken from the parent interview.

*Interview experiences*. This set of variables is based on information provided by the interviewer after the completion of the interview. It includes the evaluation of how much the primary respondent enjoyed the interview, how suspicious the primary respondent was during the interview, and how honest the interviewer thought that the primary respondent's answers were.

## Design and Measurement of the Substantive Analyses

For the substantive models, we apply Heckman's (1979) model for sample selection (Fu et al., 2004; Winship & Mare, 1992). In the present model, Heckman's model consists of two equations: a selection equation predicting response of the child and a substantive equation for parents whose children responded. The selection equation has as independent variables the same variables as presented above: (a) social and demographic characteristics of parents and children, (b) relationship characteristics, and (c) interview experiences. Moreover, the selection model also includes the other independent variables that are used in the substantive equation.

A well-known problem with the Heckman (1979) model is that it requires variables that are related to selection *but not* to the substantive issue at hand. These identifying variables are usually difficult to find (Fu et al., 2004). In the present case, we have a number of identifying variables for which the assumption of no substantive influence seems reasonable. First, there are identifying variables that can be used in all substantive analyses. These are measures of how the primary respondent experienced the interview. It is likely that disinterest in the interview or other negative experiences during the interview affect the primary respondent's permission to contact the child but it is unlikely that such experiences will be associated with the child's values, well-being, or report of support giving to the parent. We also checked these assumptions. Using an OLS model that includes the three interviewer experiences, we found few significant effects of the three interview experiences on any of the

dependent variables. One exception is that perceived honesty of the parent had a significant (positive) effect on support given by the child. We reestimated the Heckman model in this case without honesty and found very little change in the coefficients and significance levels.

Second, there are identifying variables that are different for the different substantive analyses. For example, the gender of the parent serves as an identifying characteristic in the Heckman (1979) model for children's values and well-being since there are no good reasons for expecting an effect of the gender of the parent on the child's values and well-being. However, gender of the parent is included in the model for support because children give different amounts of support to fathers and mothers. Similarly, in the support model, the parent's report on relationship quality is an identifying variable. It seems reasonable to assume that quality as reported by the parent has no influence on the support that the child gives *net* of the quality as reported by the child. We discuss other identifying variables when we explain the substantive models below.

The substantive equation is specified differently, depending on the dependent variable. In the *first substantive equations*, three dependent variables are used: the child's egalitarian gender role attitudes, the child's tolerance of alternative living arrangements (i.e., unmarried cohabitation, gay cohabiting couples, divorce when there are young children), and the child's filial obligations (i.e., the degree to which the child believes that children are obliged to care for their elderly parents). The independent variables in these substantive equations are the corresponding attitudes of the parent as well as the social and demographic characteristics of parents and children. The social and demographic characteristics of the children were included as independent variables because these are well-known determinants of attitudes (e.g., education). The same set of characteristics of parents was included to take into account socialization effects. No clear effects were expected of relationship characteristics on child attitudes and these were not included in the substantive model.

The *second substantive equation* has as dependent variable the support that the child gives to the parent (as reported by the child). This is a scale of three items: (a) done household chores for the parent, (b) helped the parent with other practical things, (c) given the parent good advice. The independent variables are the social and demographic characteristics of parents and children and the relationship characteristics. Research has shown that characteristics of both the giving and receiving actors affect support exchange between generations (Eggebeen & Hogan, 1990; Silverstein et al., 1995). An additional independent variable is the quality of the relationship as reported by the child.

The *third substantive equation* has as dependent variable the child's reported well-being, which is a scale of four items on well-being. The independent variables in this model are again the social and demographic characteristics and relationship characteristics. Research has shown that social and demographic characteristics affect well-being (Diener, Suh, Lucas, & Smith, 1999), which is the reason why we include these characteristics of the children. Parental characteristics are not believed to affect well-being and these were left out. We checked whether parental divorce affected the (adult and nonresident) child's well-being but this was not the case.

The results of the response analyses are presented in Table 1. We subsequently present substantive models for child attitudes (Table 2), child's support of parent (Table 3), and child's well-being (Table 4). In these latter tables, we not only present Heckman (1979) results, which control for selective nonresponse, but also OLS models for comparison. Heckman models are estimated by the maximum likelihood (ML) method. The selection model and the substantive model are estimated simultaneously. The Heckman model was estimated with the command `heckman` in Stata. Packages such as SPSS and SAS do not have commands for Heckman but scholars unaffiliated with these packages have provided syntax to estimate Heckman models (Jeroen Smits for SPSS and David A. Jaeger for SAS). These commands can easily be found on the Internet. The ML and OLS models are corrected for clustering to correct for the dependency of errors among children within the same family.

## Results

A total of 71% of the primary respondents gave permission to contact their child and of the latter, 66% returned the questionnaire. This amounts to an overall response rate for children of 47%. Response rates were different for other types of secondary respondents (which we do not analyze in this article). For example, the response of siblings was lower than the response of children (36 vs. 47). This seems to suggest that the closer the family member, the easier it is to get response. We also see differences between parents and children. The response of parents was lower than that of children (39 vs. 47). This difference is mainly because of the fact that primary respondents more often gave permission to contact a child than they gave permission to contact a parent (71 vs. 59). In the remainder of this article, we focus on parents who are primary respondents and children who are secondary respondents. Table 1 presents the logistic regression models for response. We first discuss the effects on permission and response by the child given permission, and next discuss the effects on the overall response.

**Table 1.** Logistic Regression of Response of Child, Permission of Parent, and Response of Child Given Permission: Regression Coefficients and *p* Values

| | Parent Gives Permission (a) | | Child Responds Given Permission (b) | | Overall Response (a × b) | |
|---|---|---|---|---|---|---|
| | *b* | *p* | *b* | *p* | *b* | *p* |
| Social and demographic characteristics | | | | | | |
| Non-Western immigrant | −.920 | .01* | −.422 | .23 | −.833 | .01* |
| Parent's years of schooling (SD = 3.22) | −.002 | .89 | .050 | .00* | .030 | .03* |
| Child's years of schooling (SD = 3.08) | .041 | .01* | .105 | .00* | .085 | .00* |
| Age of child (SD = 8.47) | −.008 | .18 | .011 | .06 | .003 | .59 |
| Parent is father (vs. mother) | .247 | .01* | −.062 | .48 | .087 | .26 |
| Child is son (vs. daughter) | −.244 | .00* | −.610 | .00* | −.546 | .00* |
| Urbanization residence parent (SD = 1.27) | −.210 | .00* | −.022 | .54 | −.128 | .00* |
| Urbanization residence child (SD = 1.16) | −.032 | .45 | −.034 | .37 | −.040 | .25 |
| Parent divorced (vs. married) | −.272 | .01* | −.485 | .00* | −.513 | .00* |
| Parent widowed (vs. married) | −.121 | .34 | −.087 | .48 | −.125 | .23 |
| Child single (vs. married) | −.231 | .01* | −.249 | .01* | −.298 | .00* |
| Relationship characteristics | | | | | | |
| Face to face contact frequency (SD = 1.34) | .119 | .00* | .007 | .84 | .059 | .04* |
| Telephone contact frequency (SD = 1.39) | −.006 | .86 | .013 | .71 | .001 | .96 |
| Relationship quality (SD = 0.70) | .248 | .00* | .224 | .00* | .288 | .00* |
| Support received from child (SD = 1.13) | .101 | .02* | .014 | .72 | .064 | .05* |
| Support given to child (SD = 1.00) | .036 | .46 | −.058 | .21 | −.013 | .75 |
| Money given to child (SD = 0.43) | .500 | .00* | .055 | .57 | .289 | .00* |
| Parent–child conflict (SD = 0.42) | −.228 | .01* | −.015 | .89 | −.142 | .11 |
| Interview experiences | | | | | | |
| Parent enjoyed interview (SD = 1.00) | .131 | .01* | .027 | .56 | .085 | .03* |
| Parent suspicious (SD = 0.29) | −1.117 | .00* | −.065 | .71 | −.741 | .00* |
| Parent honest (SD = 0.37) | .462 | .00* | .098 | .46 | .354 | .00* |
| Intercept | −.838 | .12 | −1.864 | .00* | −2.739 | .00* |
| *N* | 4,641 | | 3,331 | | 4,641 | |
| $\chi^2$ | 330 | | 201 | | 394 | |
| Mean of dependent variable (proportion) | .71 | | .66 | | .47 | |

*Note.* All independent variables obtained from interview with respondent (parent).
*$p \leq .05$.

## Selective Response

The effects of social and demographic characteristics on the probability that parents give permission to contact their child are largely in line with expectations. The odds that parents offer permission to contact their child increases with the

**Table 2.** Ordinary Least Squares (OLS) and Heckman Regression Models Predicting Child's Attitudes: Regression Coefficients and p Values

| | Liberal Living Arrangement Attitudes (OLS) | | Liberal Living Arrangement Attitudes (Heckman) | | Heckman Selection (Probit) | | Filial Obligations (OLS) | | Filial Obligations (Heckman) | | Heckman Selection (Probit) | | Gender Role Attitudes (OLS) | | Gender Role Attitudes (Heckman) | | Heckman Selection (Probit) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | b | p | b | p | b | p | b | p | b | p | b | p | b | p | b | p | b | p |
| Parental attitude | .478 | .00* | .489 | .00* | .028 | .25 | .130 | .00* | .135 | .00* | −.039 | .10 | .221 | .00* | .222 | .00* | .081 | .00* |
| Social and demographic characteristics | | | | | | | | | | | | | | | | | | |
| Non-Western immigrant | −.280 | .22 | −.290 | .21 | −.327 | .08 | .696 | .00* | .789 | .00* | −.314 | .09 | −.281 | .14 | −.283 | .14 | −.327 | .08 |
| Parent's years of schooling | .004 | .56 | .005 | .45 | .016 | .06 | −.008 | .29 | −.016 | .05* | .016 | .05* | .004 | .59 | .003 | .66 | .011 | .19 |
| Child's years of schooling | .022 | .00* | .028 | .00* | .054 | .00* | −.021 | .01* | −.034 | .00* | .052 | .00* | .069 | .00* | .071 | .00* | .050 | .00* |
| Age of child | .014 | .00* | .015 | .00* | .003 | .35 | −.005 | .10 | −.005 | .13 | .003 | .28 | .007 | .02* | .008 | .01* | .005 | .14 |
| Parent is father (vs. mother) | | | | | .066 | .18 | | | | | .090 | .06 | | | | | .106 | .04* |
| Child is son (vs. daughter) | −.179 | .00* | −.177 | .00* | −.328 | .00* | .086 | .04* | .160 | .00* | −.315 | .00* | −.381 | .00* | −.366 | .00* | −.327 | .00* |
| Urbanization residence parent | −.017 | .31 | −.017 | .31 | −.075 | .00* | .029 | .13 | .043 | .03* | −.076 | .00* | −.010 | .57 | −.011 | .56 | −.075 | .00* |
| Urbanization residence child | .034 | .05* | .033 | .06 | −.025 | .25 | −.010 | .61 | −.003 | .91 | −.018 | .41 | .070 | .00* | .068 | .00* | −.028 | .19 |
| Parent divorced | .011 | .84 | −.032 | .55 | −.336 | .00* | −.130 | .05* | −.037 | .62 | −.314 | .00* | .130 | .03* | .127 | .06 | −.336 | .00* |
| Parent widowed | −.142 | .02* | −.175 | .01* | −.113 | .08 | −.012 | .85 | .010 | .88 | −.095 | .15 | .070 | .23 | .062 | .31 | −.111 | .09 |
| Child single | .065 | .13 | .070 | .11 | −.188 | .00* | .090 | .10 | .146 | .01* | −.184 | .00* | −.081 | .10 | −.072 | .17 | −.184 | .00* |
| Relationship characteristics | | | | | | | | | | | | | | | | | | |
| Face-to-face contact frequency | | | | | .036 | .05* | | | | | .049 | .01* | | | | | .037 | .04* |
| Telephone contact frequency | | | | | .006 | .74 | | | | | .017 | .33 | | | | | .008 | .66 |
| Relationship quality | | | | | .177 | .00* | | | | | .176 | .00* | | | | | .173 | .00* |
| Support received from child | | | | | .046 | .03* | | | | | .046 | .03* | | | | | .046 | .03* |

*(continued)*

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**Table 2. (continued)**

| | Liberal Living Arrangement Attitudes (OLS) | | Liberal Living Arrangement Attitudes (Heckman) | | Heckman Selection (Probit) | | Filial Obligations (OLS) | | Filial Obligations (Heckman) | | Heckman Selection (Probit) | | Gender Role Attitudes (OLS) | | Gender Role Attitudes (Heckman) | | Heckman Selection (Probit) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | b | p | b | p | b | p | b | p | b | p | b | p | b | p | b | p | b | p |
| Support given to child | | | | | −.017 | .51 | | | | | −.002 | .93 | | | | | −.021 | .39 |
| Money given to child | | | | | .201 | .00* | | | | | .180 | .00* | | | | | .203 | .00* |
| Parent–child conflict | | | | | −.062 | .26 | | | | | −.055 | .32 | | | | | −.063 | .25 |
| Interviewer experiences | | | | | | | | | | | | | | | | | | |
| Parent enjoyed interview | | | | | .046 | .06 | | | | | .052 | .03* | | | | | .042 | .09 |
| Parent suspicious | | | | | −.423 | .00* | | | | | −.384 | .00* | | | | | −.427 | .00* |
| Parent honest | | | | | .226 | .00* | | | | | .223 | .00* | | | | | .234 | .00* |
| Other parameters | | | | | | | | | | | | | | | | | | |
| Lambda | | | .066 | | | | | | −.386 | * | | | | | .000 | | | |
| Standard error of lambda | | | .068 | | | | | | .103 | | | | | | .099 | | | |
| Intercept | −.737 | .00* | −.914 | .00* | −1.775 | .00* | .425 | .01* | −.435 | .19 | −1.916 | .00* | −1.204 | .00* | −1.234 | .00* | −1.759 | .00* |
| N | 2,223 | | 2,117 | | 4,297 | | 2,246 | | 2,140 | | 4,314 | | 2,229 | | 2,122 | | 4,309 | |

*Note.* Parental attitude is parallel measure of parent's attitude, similar to child's attitude. One-step maximum likelihood estimation.
*p ≤ .05.

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level of education of the child. Fathers are more likely to grant permission to contact their child than mothers and permission is more likely to be granted for daughters than for sons. No significant interaction was found between the gender of parent and child (not reported in the table). Parents in urban regions are less likely to grant permission than parents living in rural areas. The marital status positions of parent and child play a role as well. Divorced parents are less likely to grant permission to contact their children and permission is less often granted if the child is single. Finally, we find that non-Western immigrants are less likely to give permission to contact their child than natives.

Relationship characteristics also influence the odds that parents grant permission to contact their children. The odds of permission are higher when there is more frequent face-to-face contact with the child, when the quality of the relationship is higher, when the parent received more support from the child, and when the parent gave more financial support to the child. The odds of permission to contact the child decrease with increasing level of conflict between parent and child. No statistically significant effects are observed for the frequency of telephone contact and for the support provided to the child.

The effects of interview experiences on permission are also in the expected direction. The more parents enjoyed the interview, the more likely it is that they grant permission to contact their child. On the other hand, the more suspicion parents have shown during the interview, the less likely they are to grant permission. Finally, parents who have been perceived by the interviewer to answer the questions honestly are more likely to grant permission to contact their children.

The probability that children return the questionnaire, given that their parents have granted permission to send them one, is less strongly influenced by social and demographic characteristics, relationship characteristics, and interview characteristics than granting permission is. Of the social and demographic characteristics, 5 out of 11 effects are statistically significant. Participation by the child increases with increasing level of education of both parent and child, it is higher for daughters than for sons, it is lower if the parent is divorced and it is lower among single children. Only one of the relationship characteristics shows a statistically significant effect: the higher the relationship quality, the higher the conditional participation of the child. Finally, none of the interview experiences of the parent influence participation by the child.

Comparing the effects on both steps of the response process, it is clear that permission is better predicted than participation. Differences in this respect are smallest for social and demographic characteristics. For example, parents more often give permission to contact the child if the child is more highly

educated but higher educated children are also more likely to return the questionnaire than lower educated children. Divorced parents give permission less often but the children of divorced parents also participate less often. When looking at relationship characteristics, it is clear that there are more significant effects on permission than on participation. Only relationship quality has a significant effect on both steps of the process: Even when parents grant permission to contact a poor relationship, the chances are slim that the child in this relationship will participate. Finally, interview experiences are only related to the primary respondent's tendency to give permission. This seems plausible, but it also suggests that a negative evaluation of the interview is not communicated to the child.

The consequences of these response patterns for the overall response among children are presented in the final two columns of Table 1. Most social and demographic variables have the expected significant effects (ethnicity, parent's and child's schooling, child's gender, parent's urbanization, and parent's and child's marital status). Characteristics of the relationship also have strong and significant effects, although not all indicators play an equally important role. To compare the magnitude of the effects, we transform the coefficients into effects per standard deviation *X*, using the reported standard deviations in the table. When we do this, we see that relationship *quality* clearly has the strongest effect (.20), followed by financial transfers to the child (.12), face-to-face contact (.08), and support received (.07).

## Dependent Variable I: Attitudes of Children

The first substantive issue for which the potential consequences of selective response of children will be assessed is the intergenerational transmission of attitudes. The results of the regression models for the children's attitudes are presented in Table 2. We first discuss the substantive effects, based on the estimates of the Heckman (1979) model, followed by a discussion of the differences between these estimates and those based on OLS regression. Our main substantive interest is in the effects of parental attitudes on children's attitudes. For all three types of attitudes, a significant positive effect is observed, showing that there is a positive relationship between the attitudes of parents and children after important social and demographic characteristics of parents and children have been taken into account. The attitude variables are standardized, which implies that the regression coefficients can be regarded as standardized coefficients. The strongest degree of similarity exists for attitudes toward alternative living arrangements ($\beta = .49$). Similarity of

gender attitudes is also substantial ($\beta = .22$), whereas the degree of similarity for filial obligations ($\beta = .14$) is relatively small.

Social and demographic characteristics of the parent are of limited importance once the child's characteristics and the parent's attitudes are already included in the model. The children's own social and demographic characteristics have several significant effects. As expected, education is one of the more important determinants. Higher educated children have more liberal gender attitudes, they have weaker family obligations, and they are more tolerant about alternative living arrangements. Gender effects are also quite substantial, in line with earlier studies (Beutel & Marini, 1995). Men are more traditional about gender roles, less tolerant of alternative living arrangements, and they hold stronger norms of filial obligations. We further find age effects: The older the child, the more liberal the attitudes on gender roles and the more tolerant the child is toward alternative living arrangements. This is due to the young being more traditional in the Netherlands than the middle-aged (very few children are older than 50 years). We finally find some effects of being single, but these are limited to specific attitudes. Specifically, single children have stronger filial obligations than children who live with a partner.

Do the effects change when controlling for sample selection bias? To assess this, we compare effects in the OLS models with effects in the Heckman (1979) models. We focus only on effects that are statistically significant (in at least one model). We consider the (absolute) change in effect relative to the effect in the OLS model. We first focus on attitudes toward alternative living arrangements and gender role attitudes. For these two attitudes, the effects change on average with 10% and 5%, respectively. These are minor changes. Moreover, when there are changes, the effects tend to be stronger and not weaker after correcting for selection bias (e.g., child's education and widowed parent). There are two cases where an effect looses significance after correction (i.e., urbanization child on alternative living arrangements, parental divorce on gender role attitudes), but in these cases, the initial effect was already very small. Most important, however, we notice that the theoretically most interesting effects—those of parental attitudes on child attitudes—are estimated correctly in the OLS specification. Hence, there is no overestimate of attitude similarity when a selective sample of adult–child dyads is analyzed.

In the model for filial obligations, more changes occur. The average change in the effects is 56%. The effect of parental divorce disappears after correcting for selection bias but effects of parental education, child's gender, and whether or not the child is single become stronger. More detailed analyses show that this conclusion also depends on the specification of the model. If we include relationship characteristics in the substantive model, changes between the OLS

and Heckman models are smaller. For example, in this specification, the effect of parental divorce is insignificant in both estimates. The question is whether relationship characteristics such as contact frequency are really predictors or consequences of filial obligations. However this may be, we also see that the degree of attitude similarity between parents and children is not affected by selection bias. The standardized effect is .13 and .14 in OLS and Heckman respectively. When all relationship characteristics are included in the substantive model, the result is similar ($\beta = .13$ in both estimates).

The estimates of lambda confirm these results. Lambda is an inverse transformation of the probability of being selected (in this case, of the child responding). Hence, a positive effect means that those who are less likely to respond have higher values on the substantive outcome. For two of the attitude measures (living arrangements, gender roles), lambda has no significant effect, suggesting that there is little selection bias. For filial obligations, we find a significant negative effect, suggesting that children with stronger filial obligations are more likely to respond, a sensible result.

## Dependent Variable II: Support Provided to Parents

The second substantive issue for which the consequences of selective response of children will be assessed concerns the influence of relationship characteristics on support provision by children to their parents. The results of the regression models are presented in Table 3. Children are more likely to give support to the parent when they evaluate the quality of the relationship as better. Support is also more common when there is more frequent contact and this applies to both face-to-face and telephone contact, although face-to-face contact has the strongest effect of the two. A reciprocity effect is also present: Support given to parents positively depends on support given to the child. We emphasize that this effect is probably not in one direction—parents may give more because they receive more—hence the coefficient is affected by simultaneity bias. Financial support of the parent has no effect on the support that children give. Most of these findings are in line with what is known from the literature (Klein Ikkink et al., 1999; Silverstein et al., 1995).

Once relationship characteristics are controlled for, we see few effects of social and demographic variables. In line with other studies, we find evidence for the role of parents' need (Hogan & Eggebeen, 1995). Widowed parents receive support more often than married parents. We also see that fathers receive less support than mothers. There is no effect of parental divorce. The interaction between gender (male) and divorce is in the expected direction (negative) but it is not statistically significant. Children's marital status is

also relevant: Children who live alone provide more support than children who live with a partner.

Are these effects affected by selective nonresponse? We again compare effects between the OLS and the Heckman models. On average, the significant effects change with 8% relative to the OLS effect, a small change. The largest change is in the effect of being single, which goes from .19 in the OLS model to .22 in the Heckman model, an increase of 18%. In only one instance—urbanization of the parent's residence—do we find a "loss" of significance but the Heckman estimate remains marginally significant. The effect of lambda, finally, is not statistically significant. Hence, we conclude that effects on support giving are hardly affected by selection bias, despite the fact that the child's participation in the survey is in part driven by the same determinants as the child's support given to the parent.

## Dependent Variable III: Well-Being of Children

Our third and final substantive example in which the consequences of selective response of children in multi-actor data is assessed, concerns the effects of characteristics of the parent–child relationship on adult children's well-being. The results of the regression models are presented in Table 4. The estimates of Heckman's (1979) sample selection model suggest that children's well-being is influenced by the quality of the relationship with their parent and by the level of conflict with the parent (as perceived by the parent). The more conflict and the lower the quality of the parent–child relationship, the lower the well-being of the adult child is. Other relationship characteristics appear not to be important although telephone contact has a negative effect on well-being, perhaps because poor well-being of the child leads to more contact with the parent. If we leave this variable out, the estimates of the other effects do not change.

We also observe several significant effects of social and demographic characteristics of parents and children on the children's level of well-being. Education and well-being are positively related. Age has a negative effect on well-being showing that older children are less satisfied with their life. Well-being is lower among children who live in urban areas. Finally, children who live on their own have lower levels of well-being than children who live with a partner. Most of these findings are in line with what we know from the literature (Horwitz, Raskin White, & Howell-White, 1996). We did not include parental social and demographic characteristics in this model but we tested whether these variables indeed do not affect well-being. We found no significant effects of the parents' social and

demographic characteristics on child well-being. This applies to both the OLS and the Heckman specification.

To assess whether these effects are affected by selective nonresponse, we compare effects between the OLS and the Heckman models. On average, the differences between the two models are small. The average relative change in the strength of significant effects amounts to 7% of the OLS effect. Just one change is observed from a "statistically significant" to a "statistically insignificant" effect. In the OLS specification, sons have lower well-being than daughters, but in the Heckman specification, this difference is no longer significant. The initial effect is very small however (i.e., .08 points on the scale, which has a standard deviation of 1). The effect of lambda, finally, is not statistically significant, suggesting that the analysis of the influence of the parent–child relationship on child's well-being is hardly affected by selection bias.

## Conclusion

Data from multiple family members potentially offer interesting possibilities to enhance our understanding of the dynamics of family relationships. However, the collection of such data often suffers from high nonresponse, not just among initial contact persons within a family (primary respondents), but also among additional family members from which information is sought (secondary respondents). Primary respondents may deny permission to contact all or specific family members and these family members may in turn deny participation, even if permission to contact them is granted by the primary respondent. The aim of this article is to shed light on the factors that influence nonresponse among family members as secondary respondents and to assess the consequences and potential remedies of this nonresponse for our answers to substantively important issues in family research.

The data to assess potential bias in using multi-actor data come from the first wave of the NKPS, conducted among a representative sample of individuals living in the Netherlands. It is found that response among children of the primary respondents was 47%. Twenty-nine percent of the primary respondents did not give permission to contact their child, and among the children contacted, 34% did not return the questionnaire.

The response of children is selective in a number of important respects. First, we find that nonresponse strongly depends on relationship characteristics. There is a clear tendency that permission is more often granted if the parent and child have a high quality and intensive relationship. The quality of the relationship also positively influences the chances that children return the

questionnaire, given that the parent has granted permission. Hence, relationship quality has an effect on both steps of the response process.

Second, nonresponse depends on social and demographic characteristics. Response is higher among higher educated parents and higher educated children. Response is also higher among daughters but fathers more often give permission than mothers. Divorced parents seem to be reluctant—even after controlling for the quality of the relationship—to grant permission to contact their child, suggesting that they do not want to burden their relationship with all kinds of requests. And parents seem right in doing so, as the children of divorced parents are indeed less likely to return a questionnaire. This is even more surprising given that parents seem to have been rather selective in giving permission.

One of the interesting results of the nonresponse analysis is that the permission to contact a child is clearly influenced by the behavior of the primary respondent during the interview—as perceived by the interviewer. The less the primary respondent seemed to enjoy the interview and the less honest and more suspicious he or she seemed to behave the less likely it was that permission to contact a child was granted. This suggests that the response rate of secondary respondents can be improved by increasing rapport between interviewer and primary respondent and by providing the primary respondent with more reassuring information about the uses of the data. This is important because overall nonresponse of secondary respondents can be improved considerably by improving permission rates.

To examine the consequences of alter nonresponse, three substantive issues were analyzed by using OLS regression and Heckman's sample selection model, which controls for selective response. The substantive models all relied on information that was obtained from the child for constructing the dependent variable (i.e., attitudes of the child in the first model, support of the child to the parent in the second model, and well-being of the child in the third model). For four of the five dependent variables, selective nonresponse among children did not influence the substantive conclusions. The parameter estimates differed in some cases, but the differences were small and changes from insignificant to significant effects rarely occurred. If they occurred, the effects were small to begin with, which suggests that we should not pay much attention to small effects (a good suggestion anyway). In addition, the estimates for lambda suggested that no selection bias was present for four of the five substantive models. In one case did we find more substantial changes, and that was for children's attitudes toward filial obligations. Children with stronger feelings of obligations toward parents were more likely to respond, given the negative effect of lambda, and including this parameter changed

some of the effects, although not the degree of attitude similarity between parents and children, which was the main concern in this analysis.

What conclusions can be drawn from these results? The first conclusion is that previous applications that have used multi-actor data may not be too biased after all. Although our results are in this sense reassuring, we do not conclude that sample selection bias is unimportant and that using Heckman's sample selection model is not worthwhile. On the contrary, it is important to be reassured empirically that one's model is not influenced by selection bias. We think that an important reason why no selection bias was present in our examples is that our models are well-specified and that a number of factors that influence selection into the sample also influence the substantive results. For instance, the quality of the parent–child relationship influences not just the response of the child, but also the support that children give to parents and the level of well-being of children. So this and other important determinants of selectivity are already included in the substantive equation, thus effectively reducing the potential-selectivity bias. We do caution, however, that the results of the Heckman models can be sensitive to the way the model is specified and that the procedure cannot be used mechanically. Both empirical and theoretical considerations should guide the specification of the model.

Overall, our results suggest that using multi-actor data to study dynamics within families is a promising avenue and that such data can yield important insights even with high and selective levels of nonresponse among family members. Evidently, there is an important proviso, and that is that one needs to be able to specify a well-fitting model to explain the selection. Our conclusion is not that selection can be ignored. Although our models show that selection may not necessarily bias substantive outcomes, each new substantive model will require a new test of selection bias. To be able to do this, it is essential that researchers include measures in their data that can function as identifying variables, that is, variables that affect selection but not substantive outcomes in family life. We have provided examples of such measures and we would like to encourage future multi-actor researchers to collect more of such measures. One fruitful way to enrich this set of measures is to include information about the response rates of interviewers in the model, since one can assume that interviewers with better response rates manage to get permission more often from the primary respondent, while at the same time, these interviewer response rates are unrelated to characteristics of primary and secondary respondents.

**Table 3.** Ordinary Least Squares (OLS) and Heckman Regression Models Predicting Child's Support of Parent: Regression Coefficients and *p* Values

| | Support of Child to Parent (OLS) | | Support of Child to Parent (Heckman) | | Heckman Selection (Probit) | |
|---|---|---|---|---|---|---|
| | b | p | b | p | b | p |
| **Social and demographic characteristics** | | | | | | |
| Non-Western immigrant | .180 | .54 | .289 | .45 | −.506 | .00* |
| Parent's years of schooling | .002 | .84 | −.002 | .87 | .017 | .01* |
| Child's years of schooling | .002 | .76 | −.006 | .79 | .055 | .00* |
| Age of child | −.001 | .72 | −.002 | .54 | .001 | .71 |
| Parent is father (vs. mother) | −.222 | .00* | −.230 | .00* | .048 | .20 |
| Child is son (vs. daughter) | −.038 | .33 | .000 | .99 | −.314 | .00* |
| Urbanization residence parent | −.058 | .00* | −.049 | .06 | −.061 | .00* |
| Urbanization residence child | .048 | .01* | .052 | .01* | −.023 | .17 |
| Parent divorced | .031 | .62 | .045 | .72 | −.309 | .00* |
| Parent widowed | .403 | .00* | .404 | .00* | −.125 | .02* |
| Child single | .188 | .00* | .222 | .01* | −.183 | .00* |
| **Relationship characteristics** | | | | | | |
| Relationship quality (child report) | .247 | .00* | .248 | .00* | | |
| Relationship quality (parent report) | | | | | .189 | .00* |
| Face to face contact frequency | .181 | .00 | .168 | .00* | .040 | .00* |
| Telephone contact frequency | .059 | .00* | .060 | .00* | .000 | .98 |
| Support given to child | .068 | .00* | .057 | .03* | .013 | .47 |
| Money given to child | .009 | .85 | −.020 | .77 | .164 | .00* |
| Parent–child conflict | .077 | .21 | .085 | .26 | −.082 | .06 |
| **Interviewer experiences** | | | | | | |
| Parent enjoyed interview | | | | | .039 | .04* |
| Parent suspicious | | | | | −.404 | .00* |
| Parent honest | | | | | .205 | .00* |
| **Other parameters** | | | | | | |
| Lambda | | | −.243 | | | |
| Standard error of lambda | | | .524 | | | |
| Intercept | −1.909 | .00* | −1.566 | .03* | −1.756 | .00* |
| N | 2,226 | | 2,116 | | 4,635 | |

*Note.* One-step maximum likelihood estimation.
*p ≤ .05.

**Table 4.** Ordinary Least Squares (OLS) and Heckman Regression Models Predicting Child's Well-Being: Regression Coefficients and *p* Values

|  | Well-Being (OLS) | | Well-Being (Heckman) | | Heckman Selection (Probit) | |
|---|---|---|---|---|---|---|
|  | *b* | *p* | *b* | *p* | *b* | *p* |
| Social and demographic characteristics |  |  |  |  |  |  |
| Non-Western immigrant | .365 | .05* | .404 | .05* | −.515 | .00* |
| Parent's years of schooling |  |  |  |  | .019 | .00* |
| Child's years of schooling | .045 | .00* | .040 | .00* | .052 | .00* |
| Age of child | −.013 | .00* | −.013 | .00* | .002 | .50 |
| Parent is father (vs. mother) |  |  |  |  | .059 | .11 |
| Child is son (vs. daughter) | −.083 | .04* | −.056 | .26 | −.332 | .00* |
| Urbanization residence parent |  |  |  |  | −.070 | (.00*) |
| Urbanization residence child | −.042 | .01* | −.041 | .02* | −.029 | .09 |
| Parent divorced |  |  |  |  | −.311 | .00* |
| Parent widowed |  |  |  |  | −.100 | .05* |
| Child single | −.509 | .00* | −.486 | .00* | −.185 | .00* |
| Relationship characteristics |  |  |  |  |  |  |
| Relationship quality (parent report) | .274 | .00* | .273 | .00* | .186 | .01* |
| Face to face contact frequency | −.004 | .82 | −.010 | .60 | .034 | .01* |
| Telephone contact frequency | −.033 | .04* | −.033 | .05* | .000 | .98 |
| Support received from child | .010 | .61 | .004 | .84 | .043 | .00* |
| Support given to child | −.017 | .47 | −.018 | .46 | −.007 | .70 |
| Money given to child | −.007 | .88 | −.009 | .86 | .182 | .00* |
| Parent–child conflict | −.177 | .00* | −.177 | .01* | −.065 | .13 |
| Interviewer experiences |  |  |  |  |  |  |
| Parent enjoyed interview |  |  |  |  | .044 | .01* |
| Parent suspicious |  |  |  |  | −.452 | .00* |
| Parent honest |  |  |  |  | .212 | .00* |
| Other parameters |  |  |  |  |  |  |
| Lambda |  |  | −.083 |  |  |  |
| Standard error of lambda |  |  | .135 |  |  |  |
| Intercept | −.435 | .05* | −.258 | .36 | −1.759 | .00* |
| *N* | 2,151 | | 2,151 | | 4,593 | |

*Note.* One-step maximum likelihood estimation.
*\*p ≤ .05.*

## Appendix

*Description of Variables Used in the Analyses*

| Variable | Source | Description | Mean | Standard Deviation | N |
|---|---|---|---|---|---|
| Social and demographic characteristics | | | | | |
| Gender of parent | Primary respondent | Mothers = 0, fathers = 1 | 0.41 | | 4,940 |
| Gender of child | Primary respondent | Daughters = 0, sons = 1 | 0.48 | | 4,940 |
| Age of child | Primary respondent | | 34.18 | 8.47 | 4,940 |
| Parent's years of schooling | Primary respondent | Highest level of education completed, recoded to the approximate number of years of schooling required for obtaining the degree | 10.40 | 3.20 | 4,940 |
| Child's years of schooling | Primary respondent | Highest level of education completed, recoded to the approximate number of years of schooling required for obtaining the degree | 11.90 | 3.10 | 4,940 |
| Urbanization residence parent | Primary respondent | Urbanization of the place of residence, coded from 1 (*not urbanized, less than 500 addresses per square kilometer*) to 5 (*highly urbanized, more than 2,500 addresses per square kilometer*) | 3.07 | 1.27 | 4,940 |
| Urbanization residence child | Primary respondent | Urbanization of the place of residence, coded from 1 (*not urbanized, less than 500 addresses per square kilometer*) to 5 (*highly urbanized, more than 2,500 addresses per square kilometer*) | 3.28 | 1.16 | 4,940 |

*(continued)*

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## Appendix (continued)

| Variable | Source | Description | Mean | Standard Deviation | N |
|---|---|---|---|---|---|
| Ethnicity parent | Primary respondent | Whether or not the parents of the respondent are born in Morocco, Turkey, Suriname, or the Antilles | 0.02 | | 4,940 |
| Marital status parent | Primary respondent | Whether or not the parent was (a) divorced, (b) widowed, or (c) married (or cohabiting). There were very few never-married parents. The divorce of the parent applies to a divorce of the parent from the other biological parent of the child | 0.20 / 0.17 | | 4,940 |
| Marital status child | Primary respondent | Whether the child *was married/cohabiting* (coded 0), or *living alone* (coded 1) | 0.27 | | 4,940 |
| Relationship characteristics | | | | | |
| Face-to-face contact | Primary respondent | The number of times the parent saw the child in the past 12 months, recoded to the approximate number of times per year. Because the variable is skewed, the natural logarithm was taken | 3.50 | 1.34 | 4,940 |
| Other contact | Primary respondent | The number of times the parent had other contact with the child, including telephone and email contact. The coding was similar as for face-to-face contact | 3.80 | 1.39 | 4,940 |
| Quality of the relationship | Primary respondent | The perceived quality of the relationship coded in four categories (1= *poor*, 2 = *reasonable*, 3 = *good*, 4 = *very good*) | 3.48 | 0.70 | 4,940 |
| Support given to child | Primary respondent | A sum of three items: (a) done household chores for the child, (b) helped the child with other practical things, (c) given the child good advice. Items are coded 1 if *the support was given in the past 3 months (0 otherwise)* | 1.56 | 1.00 | 4,940 |

*(continued)*

**Appendix (continued)**

| Variable | Source | Description | Mean | Standard Deviation | N |
|---|---|---|---|---|---|
| Support received from child | Primary respondent | A sum of three items: (a) child did household chores for the parent, (b) the child helped the parent with other practical things, (c) the child gave good advice to the parent. Items are coded 1 if the *support was given in the past 3 months* (0 *otherwise*) | 2.30 | 1.13 | 4,940 |
| Financial support given to the child | Primary respondent | Whether the parent gave financial support to the child in the past 12 months. | 0.24 | | 4,940 |
| Conflict | Primary respondent | Having experienced conflicts or tensions with the child in the past 3 months (1 = *not at all*, 2 = *once or twice*, 3 = *more often*) | 1.15 | 0.42 | 4,940 |
| Interview experiences | | | | | |
| Positive evaluation of interview | Interviewer | Sum of two interviewer ratings: (a) how interested the respondent was in the interview (scale 1-5) and (b) how pleasant the interview was (scale 1-5). The two items are positively correlated (r = .45) | 7.24 | 1.03 | 4,641 |
| Suspicion during interview | Interviewer | Whether or not the respondent was suspicious about the study during the interview (0 = *no*, 1 = *yes*) | 0.09 | | 4,641 |
| Honesty | Interviewer | How honest the interviewer thought the respondent answered the questions (1 = *often not honest*, 2 = *not honest once in a while*, 3 = *honest most of the time or always*) | 2.86 | 0.37 | 4,641 |

*(continued)*

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## Appendix (continued)

| Variable | Source | Description | Mean | Standard Deviation | N |
|---|---|---|---|---|---|
| Additional variables application 1 | | | | | |
| Child's gender role attitudes | Child | A scale of five items about the way gender roles should be divided. Cronbach's $\alpha$ = .78 and .77 (first respectively second child) | 0.00 | 1.00 | 2,310 |
| Child's attitudes toward alternative living arrangements | Child | A scale of three items about how acceptable alternative living arrangements are for the respondent (i.e., unmarried cohabitation, gay cohabiting couples, divorce when there are young children). Cronbach's $\alpha$ = .77 and .80. | 0.00 | 1.00 | 2,310 |
| Child's attitudes toward filial obligations | Child | A scale of four items about whether people think that children are obliged to care for their elderly parents when parents need it. Cronbach's $\alpha$ = .72 and .72 | 0.00 | 1.00 | 2,310 |
| Parent's gender role attitudes | Primary respondent | A scale consisting of five items about the way gender roles should be divided. Cronbach's $\alpha$ = .77 | 0.00 | 1.00 | 4,572 |
| Parent's attitudes toward alternative living arrangements | Primary respondent | A scale of three items about how acceptable alternative living arrangements are for the respondent (i.e., unmarried cohabitation, gay cohabiting couples, divorce when there are young children). Cronbach's $\alpha$ = .73 | 0.00 | 1.00 | 4,556 |
| Parent's attitudes toward filial obligations | Primary respondent | A scale of four items about whether people think that children are obliged to care for their elderly parents when parents need it. Cronbach's $\alpha$ = .74 | 0.00 | 1.00 | 4,574 |

*(continued)*

## Appendix (continued)

| Variable | Source | Description | Mean | Standard Deviation | N |
|---|---|---|---|---|---|
| **Additional variables application II** | | | | | |
| Support given to the parent | Child | A sum of three items: (a) child did household chores for the parent, (b) the child helped the parent with other practical things, (c) the child gave good advice to the parent. Items are coded 1 if the *support was given in the past 3 months* (0 *otherwise*) | 1.78 | 0.99 | 2,232 |
| Quality of the relationship | Child | The perceived quality of the relationship coded in four categories (1 = *poor*, 2 = *reasonable*, 3 = *good*, 4 = *very good*) | 3.38 | 0.74 | 2,286 |
| **Additional variables application III** | | | | | |
| Well-being | Child | A scale of four items on well-being: (a) my life is ideal in most respects, (b) my living circumstances are excellent, (c) I am satisfied with my life all things considered, (d) if I could live my life again, I would do few things differently. 5-point answering categories per item. Cronbach's $\alpha$ = .81 and .82 | 0.00 | 1.00 | 2,151 |

*Note.* Attitude and well-being scales constructed by summing standardized items and standardizing the sum. No standard deviations presented for binary variables.

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