Background: Knowledge about the lives of single women who choose to become mothers by sperm donation is very limited. Methods: This study comprises 62 families headed by formally single women who, following their decision to give birth to a child with the aid of sperm donation, by means of insemination or in vitro fertilization (IVF), used the services of one sperm bank in Israel. Results: The findings of the study, based on the reports obtained from the mothers in face-to-face interviews by structured questionnaires with closed-ended scales and single item open questions, present a complex picture of formally single-mother families assisted by sperm donation. They shed light on socio-demographic and conception related information of the mothers in the sample, on mothers’ and children’s health, on the children’s socio-emotional development and mother–child relationship and on the mothers’ difficulties and needs encountered in their function as single parents. Conclusions: Although the currently young children’s socio-emotional development seems to be within the normal range, the mean age of 43 years at first birth of the mothers, the fact that about one-fifth of them gave birth to twins, the health condition of some of the mothers and children, and the difficulties they encounter, may raise some concerns.

Keywords: sperm donation; donor insemination; IVF; single mothers; Israel

Introduction

Very little is known about the lives of single women in their late 30s and 40s who choose to become mothers with the aid of sperm donation. We do not know very much about their socio-demographic characteristics, health, number and types of fertility treatments they are willing to undergo, the outcome of these attempts and the resultant children’s physical and emotional wellbeing.

One of the reasons for this lack of information is that it is not easy to identify these families among the single-parent families. The structure of families in the Western world has radically changed in the last decades and the rate of single-parent families has increased significantly. The statistics on single-parent families, however, mask the fact that behind the term ‘single-parent families’ various types of families, among them divorced, cohabiting, teenage mother families, single by choice and lesbian can be found (Rosenkrantz et al., 2004).

Following their book on the growth, diversity and dynamics of ‘lone’ parenthood (Rowlingson and McKay, 1998), in their more recent book, the authors (Rowlingson and McKay, 2002) define lone parents as people who are not living with a partner but are living with dependent children. However, in line with the notions of Rosenkrantz et al. (2004) concerning the blurred boundaries of current family structures, Rowlingson and McKay (2002) claim that in the contemporary definition of family structure, the living arrangements and feelings of identity or being part of a couple are more important than the marital status. Murray and Golombok (2005a) define single mothers who raise their children from birth without a partner as ‘solo’ mothers. In contrast to young single mothers raising their children alone due to unplanned pregnancy, or older single mothers by choice who became mothers through natural birth or adoption (e.g. Mannis, 1999), Murray and Golombok (2005a) focused in their study on single-mother families with an infant conceived by donor insemination (DI). They claimed that these women represent a distinct subgroup of single mothers who, out of a strong desire for a child, have made the active choice to go it alone. As the rate of families aided by advanced human reproduction technologies has increased, there are more single women who choose the path of achieving motherhood with the aid of DI or in vitro fertilization (IVF) with gamete donation. This path may become painful when chosen later in life, with varying results (Hewlett, 2002).

Whereas couples seek assisted conception with the aid of sperm donation when the husband is infertile, single women opt for sperm donation when they do not have or want male
partners. The way to get pregnant with the aid of sperm donation for fertile single women is DI. Infertile or older single women wishing to use sperm donation need sometimes in addition to sperm donation also IVF treatments.

**Single-mother families aided by sperm donation and their well-being**

A number of reviews of the existing research in the area of assisted conception parenthood and child well-being were published in recent years (Brewaeys, 2001; Hahn, 2001; Colpin, 2002; Golombok and MacCallum, 2003; Lansac and Royere, 2001). Golombok et al. (2004) examined the psychological wellbeing of parents and the quality of parent–child relationships of infants conceived by gamete donation. Although the authors of these reviews identified many methodological problems in the various studies reviewed, the findings did not point out adverse effects of these alternative family structures on child development. However, most of the reviewed studies concerned couples and their children. In their study of single-mother families with an infant conceived by DI and in a follow up when the infants reached age 2, Murray and Golombok (2005a,b) pointed out that what distinguishes the case of single mothers conceived by DI from other single mothers is that the child is genetically related to the mother but has no known social or genetic father. With respect to these families, the concerns center around the effects of growing up in a fatherless family and are based on research showing negative outcomes in terms of cognitive, social and emotional development and health for the children (McMunn et al., 2001; Weitsof et al., 2003; McConachie, 2004) and for the health of the mothers (Weitsof et al., 2000; Whitehead et al., 2000; Franz and Lensche, 2003; Roos et al., 2005).

However, although mothers raising their children without a father reported more severe disputes than did mothers in father-present families, the children’s social and emotional development was not found to be negatively affected by the absence of a father in a study of fatherless families from infancy (MacCallum and Golombok, 2004). These findings may perhaps be explained by the fact that the children of single DI mothers have not experienced parental separation (Golombok and MacCallum, 2003; Murray and Golombok, 2005a,b). Yet, single mothers being the only adult in the family need to allocate their time to both care giving and income generation, thus probably having to rely on a range of support mechanisms (Albelda et al., 2004) and to have a more sound financial basis.

In the only sample studying single mothers by choice with the aid of DI (Murray and Golombok, 2005a,b), the focus was on the comparison between 27 single-mother DI families and 50 married DI families. According to the reported findings, single mothers showed lower levels of mother–child interaction and lower levels of sensitivity toward their infant than married mothers. They were more open toward disclosing the donor conception to the child than were married DI mothers. According to the follow-up at age 2 of the children, in what smaller samples (21 solo and 46 married mothers), despite the fact that the single mothers spent less time with their child and were less sensitive to their child’s needs, fewer emotional and behavioral difficulties were shown by children of single than married DI mothers (Murray and Golombok, 2005b). The findings indicated that single DI mothers appeared to be more comfortable about parenting than married DI mothers, and overall, their parenthood did not give cause for concern. However, as Murray and Golombok (2005a) noted, the children in the study were still infants and it will be some time before their feelings about the fact that they will never know the man who was their sperm donor will be known. As for the single mothers themselves, the findings showed a group of college educated women in their late 30s, financially secure professionals who did not resemble the poorer, working class single mothers in previous studies. The Murray and Golombok’s (2005a,b) small samples were recruited from four clinics in the UK, and their studies centered on DI families with singletons only. Yet, unlike in DI, in IVF-aided pregnancies, there is a high incidence of multiple pregnancies, Caesarian sections, prematurity and low birth-weights, sometimes resulting in the children’s malformation. For example, the rate of major and minor malformation incidence detected at birth among children born with the aid of IVF found in an Israeli study was three times higher than in the general population (Hourvitz et al., 2005). Moreover, according to a world collaborative report on IVF, in 2000, the chance to give birth to twins in IVF-aided pregnancies was 27% (Adamson et al., 2006). Furthermore, in a study regarding behavioral and cognitive development and family functioning of twins conceived by assisted reproduction in two parent-families, mothers of twins showed significantly higher levels of parenting stress and depression than mothers of singletons, and were significantly more likely to find parenting difficult. Whereas no difference in the level of emotional or behavioral problems was found, in another study, twins showed significantly lower levels of cognitive functioning (Olivennes et al., 2005). Not only were the obstetric outcomes poorer in IVF twins than IVF singletons, but also the maternal risks were found to be higher in these births (Pinborg et al., 2004).

The published research on single mothers aided by sperm donation is very sparse, and there are no studies on single mothers by choice who gave birth with the aid of sperm donation and IVF and/or those who raise twins. The aim of the present analysis is to provide an insight to the lives of formally single mothers who applied to one sperm bank in Israel for sperm donation, and focus on their socio-demographic characteristics, health, the fertility treatments they were willing to undergo and the outcome of these attempts.

**Materials and Methods**

**Participants and procedure**

Sixty-two formally single-mother families with children conceived with the aid of sperm donation were recruited through one sperm bank in Israel. According to the record of the sperm bank, during its first 6 years, frozen sperm from donors unknown to the women was provided to 924 Jewish Israeli women. About 60% of them declared themselves as formally single. Although among the formally single-mother families in the community, some of the mothers may be lesbian, women applying for sperm donation in Israel are not asked...
about their sexual orientation. Following various types and numerous cycles of fertility treatments, 466 pregnancies were achieved. These pregnancies ended in 357 births. Since married couples aided by sperm donation in Israel are very keen on keeping this fact in secrecy, our research focuses on single women only. We were able to contact 104 of the mothers who identified themselves formally as single. They comprise about 50% of the formally single-mother families aided by this sperm bank. The mothers were initially contacted by one of the researchers through telephone, told about the research and asked whether they agree that a letter asking for their written consent to participate in the research may be mailed to them. Only four of the mothers did not give their consent to participate in the study, two due to lack of time and two due to uneasiness. We made appointments for personal meetings with the study participants only after the signed written consents were returned. We interviewed 62 of the single mothers who were randomly selected from the list of those who agreed to participate in the study. On the basis of the information collected routinely by the sperm bank, the women interviewed in the study do not differ from those who were not. The majority of the mothers were interviewed in their homes. Data were obtained from the mothers in face-to-face interviews that lasted between 1–3 h, during which they were asked to provide answers to a structured questionnaire that contained both open-ended questions and closed-ended scales. The interviews were conducted by two of the principal researchers and by one psychology and one social work graduate student who were carefully instructed on how to collect the data and debriefed after the interviews.

**Measures**

**Demographic and social variables**

Demographic and factual questions regarding the mother included age at birth, education, formal family status, religiosity, type of community in which the family lives, current living arrangement, type of mother’s work/employment and the number of hours the mother works per week.

**Conception-related and health variables**

These variables included: types of fertility treatments, type of birth, number of children born following first birth with assisted conception, number of children born following second birth with assisted conception, child’s/children’s current age, child’s/children’s sex, child’s/children’s birthweight, mother’s physical health, child’s/children’s physical health and incidence of children’s congenital malformations and developmental problems. Interviews with mothers of twins were conducted for each child separately.

**Children’s socio-emotional development and mother-child relationship**

The presence of emotional or behavioral problems in the children was assessed, in line with the study of Golombok et al. (2002a,b), by using the strengths and difficulties questionnaire (SDQ) (Goodman et al., 2000). This questionnaire, including 25 items (concerning emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems and prosocial behavior), administered to the mother, measures the overall socio-emotional adjustment of the child. This questionnaire has been shown to have good reliability rates and to discriminate well between children with and without psychiatric disorder (Olivennes et al., 2005).

Based also on a previous work of Golombok et al., (2002), children’s functioning at school or kindergarten, and their relationships with peers and the mother were assessed by the Child and Adolescent Functioning and Environment Schedule (CAFÉ) (John and Quinton, 1991), using the following ratings: (i) interest/effort in school/kindergarten on a 4-point scale from 1 (no interest/effort) to 4 (above average interest/effort) and assessed the extent to which the child maintained effort and interest in educational setting; (ii) worries/difficulties with teachers was measured on a 4-point scale from 1 (none) to 4 (major difficulties); (iii) the child’s relationships with peers were assessed on the same scale as worries/difficulties about teachers: from 1 (none) to 4 (major difficulties) and intended to assess issues of not having friends or being bullied.

The conflict tactics scale (Strauss, 1979) assessed how the mothers act during a conflict with the children. This scale showed high internal consistency (0.64–0.99) (Golombok et al., 2002). We also asked our respondents to assess their pleasure from motherhood (1, very low; 10, very high). Finally, we also asked them whether they have any special needs.

**Results**

**Socio-demographic data**

Table 1 summarizes the participants’ socio-demographic characteristics. The mean age at birth of the single mothers in this sample is almost 43 years. Some of the women choosing to become mothers with the aid of donor gamete were in their late 30s, whereas the oldest woman in the sample to give birth was 56 years old. As the table shows, the large majority of the women in the sample have never been married; only four of them were married shortly and divorced without having children. None of the women have changed their family status since giving birth. It has, however, to be noted that some of them explicitly indicated that they still have hopes to find the ‘right’ partner in the future. Over three quarters of the participants are college graduates, about one-third of them with graduate degrees or higher. As a result, about 95% of them have professional careers or are self-employed. Almost all of them work full time, only seven (about 12%) of them did not work at the time of data collection, but also planned to start working again soon. Consequently, almost all of the children were during daytime in daycare, kindergarten or school. Nevertheless, some of the mothers noted that due to motherhood their careers underwent a significant change. There are mothers, who in contrast to their long days at work in the past have decided now to work less, and mothers who changed their occupation in order to be able to invest more time in their children, but also mothers who had to take on weekend work in order to meet ends. Yet, other mothers, particularly those of twins, had to give-up plans for the promotion of their career or continuing in their own education.

The majority of single-mother families in this sample live in larger urban communities. Some of the participants explicitly pointed out that due to the diversity of family structures in a larger city and the resultant tolerance, it is easier for them to raise their child in a city than in a smaller community. Two-thirds of the sample raise their children alone, 17.7% live with a female partner. In contrast to research on lesbian mothers involving complicated measures to recruit participants from the lesbian community (e.g. Stevens et al., 2003), our data were collected from the clientele of a sperm bank. As the sperm bank does not ask about the applicant’s sexual orientation, we learned about the rate of lesbian mothers in the study from the answers of those mothers who reported that their current living
arrangement is with a female partner. This rate does not take into account the possibility of lesbian mother families who do not live with a partner. Obviously, the lesbian mothers in the sample are single only formally, since in their everyday life they have a partner to share the responsibilities.

The situation is different for all the other women who do not have a partner. At least 10 of the study participants (16%) have changed their living arrangements, since they became mothers in order to get help with raising their children. Eight women (13%) have moved back to their parents’ home, two are employing living-in maids. In addition, a number of women in the sample have decided to move close to their extended families, or even to an apartment in the same building with their parents/mother/father, in order to get support from them in raising the children. Presumably due to their full-time work, these mothers of young children reported that they needed much help from their families. There were mothers who relied upon their parents’ assistance in taking the children daily to and/or from educational institutions, and/or baby-sit for them when the children were sick. Some of them mentioned explicitly that they also need financial assistance from their parents or siblings.

Although almost 80% of the sample comprised secular-single women, it also included religious single women, two of them orthodox. The latter shared with us that the use of DI was for them the only legitimate way to become biological mothers without getting married.

**Conception-related variables**

Given the age of women in the sample, DI did not always suffice. As Table 2 shows almost 60% of the women needed in addition to sperm donation IVF, and 11 (18%) of them oocyte donation too. In order to achieve motherhood, women in this sample underwent on average six fertility treatment cycles. As the range of the fertility treatment cycles shows, some of the women did not give-up the idea of motherhood even if that meant to undergo many cycles of fertility treatments with all their short- and long-term medical and psychosocial implications. Due to the need for fertility treatments, and the subsequent high-risk pregnancies, less than one-third of the sample had a spontaneous birth.

Sixty-two women gave birth to 74 children in their first birth. Of these births, 80% were singletons and 20% twins; in one of the 11 pairs of twins in the sample following a 6 weeks long hospitalization in intensive care, only one of the twins survived. Almost one-third of the children born after the first birth of the women in the sample are twins.

Six women, about 10% of the sample, however, used assisted conception and donor sperm successfully again in order to achieve a second pregnancy. Thus the total number of children born to this sample of 62 single women with the aid of donor sperm is 82. According to the findings in Table 2, only one quarter of the children born in the women’s first birth is older than four. This result reflects both the gradual increase in the number of single women applying for sperm donation and the success to conceive even in older age as the technology improves over the years. There were more male than female births in this sample (53.6% and 46.3%, respectively).

**Mothers’ and children’s health**

The mothers were requested to assess their own and their children’s health on a scale from 1 (poor) to 10 (excellent). According to the self-assessed report, as shown in Table 3, the health status of both groups, mothers and children, is very good. However, at least one quarter of the mothers...
shared with us the information that they had chronic diseases, such as diabetes, high blood pressure or kidney disease that require taking medications regularly. Some of the mothers mentioned that they also had other long-term health problems, such as impaired vision, depression or severe low back pain, prior to their first pregnancy. On the other hand, a few of the mothers during the interviews have complained that their health had deteriorated following pregnancy and birth. One of them, who gave birth to twins, had suffered after birth thrombosis in her lungs, resulting in serious health complications.

As the data in Table 4 show, despite the high mean, the wide range in the mothers’ report of their children’s actual health status hints that the health of some of the children may be somewhat problematic. Indeed, according to the mothers’ reports, about 8% of the children suffer from congenital malformations and for about 12% there is an evidence of having developmental problems, such as delays in walking or talking.

### Children’s socio-emotional development and mother–child relationship

Although the mothers in the sample gave answers to most of the items in the SDQ (Goodman et al., 2000), and the SDQ scores placed the children within the normal range, given the young age of the children it seems that it is more appropriate to view their answers as to their practical rather than statistical significance. The fact is that with very few exceptions, the mothers in the sample perceived their children as well adjusted, socially and emotionally. These results were supported by the data obtained regarding the children’s functioning at school or kindergarten, and their relationships with peers, as assessed by the Child and Adolescent Functioning and Environment Schedule (CAFÉ) (John and Quinton, 1991) ratings. Almost all of the children have shown very much interest in school or kindergarten, very few of them had some difficulties with teachers, and 84% of them did not experience any problems with their peers.

Regarding the mothers’ report on the conflict tactics scale (Strauss, 1979), their measures of control were based primarily on reasoning, and only 20% reported occasionally trying to hit or hitting the child at least once during a year. We also asked our respondents to assess their pleasure from motherhood; the mothers in this sample have assessed their pleasure at the average of 9.73 (range: 8–10). A significant non-parametric correlation was found between the mothers’ pleasure from motherhood and the children’s prosocial subscale of the SDQ: the higher the mothers’ pleasure, the less social problems the children have experienced (P < 0.01). Children’s socio-emotional development and mother–child relationship did not differ for the subgroup of mothers in the sample who were aided by both sperm and oocyte donation.

### Singletons versus twins

Our comparison between the children who were born (at mothers’ first birth) as singletons and as twins, respectively, revealed three significant differences between these two groups. As Table 5 shows, and as expected, the weight at birth of twins was significantly lower and the rate of their disability was significantly higher than that of the singletons in the sample. When examining whether the children were being picked on or bullied by other children, twins were significantly more exposed to this behavior than singletons.

### Mothers’ difficulties and special needs

In response to the open-ended question whether they have difficulties or special needs, nearly half of the respondents reported that they do not have any. Among the answers of those participants who responded affirmatively, the task of decision-making alone was most frequent. These mothers felt that their everyday life contains many responsibilities and they are alone when a decision has to be taken. They were particularly concerned about their need for decision-making when the children are sick. However, it has to be pointed out that in contrast to these mothers, there were a few others who claimed that they are glad that they do not have to share with anybody else decisions regarding the ways their children are raised. One of the mothers who happened to grow-up in a fatherless family herself claimed that perhaps the mother-child family is the preferred family structure. Another indicated that viewing her married friends having arguments with their husbands about the education of their children, she is sometimes happy that she does not have to go through this process. Nonetheless, the participants of the study had other concerns, mainly financial difficulties and lack of time for themselves and for their social life. It has to be indicated that 7 out of the 11 lesbian mothers in this sample also claimed to have difficulties in

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**Table 3: Mother and children’s health status assessment**

<table>
<thead>
<tr>
<th>Variable</th>
<th>n, Mean, SD (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother’s health status</td>
<td>61, 7.9, 1.87 (4–10)</td>
</tr>
<tr>
<td>Children’s health status</td>
<td>71, 9.0, 1.81 (1–10)</td>
</tr>
</tbody>
</table>

**Table 4: Children’s health status**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number of cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congenital malformations (n = 72)</td>
<td>6 (8.33)</td>
</tr>
<tr>
<td>Incidence of developmental problems (n = 72)</td>
<td>8 (12.5)</td>
</tr>
</tbody>
</table>

**Table 5: Singletons (n = 49) versus twins (n = 22): t-test for equality of means**

<table>
<thead>
<tr>
<th>Variable</th>
<th>F</th>
<th>t</th>
<th>df</th>
<th>Significance (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child’s weight at birth</td>
<td>16.838</td>
<td>2.941</td>
<td>69</td>
<td>0.004</td>
</tr>
<tr>
<td>(1, less than 1500 g; 3, more than 2000 g)</td>
<td></td>
<td>2.694</td>
<td>33.416</td>
<td>0.011</td>
</tr>
<tr>
<td>Child was born with disability</td>
<td>16.117</td>
<td>1.727</td>
<td>69</td>
<td>0.089</td>
</tr>
<tr>
<td>(1, No; 2, Yes)</td>
<td></td>
<td>2.588</td>
<td>48</td>
<td>0.013</td>
</tr>
<tr>
<td>Child is picked on or bullied by other children</td>
<td>32.570</td>
<td>2.117</td>
<td>55</td>
<td>0.039</td>
</tr>
<tr>
<td>(1, not true; 3, certainly true)</td>
<td></td>
<td>3.132</td>
<td>38</td>
<td>0.003</td>
</tr>
</tbody>
</table>

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2788
raising their children. Their difficulties included worries about the fact that their children lack male figures and lack of leisure time.

Discussion
The results of this study reveal that although the majority of the 62 formally single women in this sample gave birth in their early forties, some of them have decided to do so in their 50s. The mean age at first birth in this sample of women is higher by 5 years than the mean age of women in the Murray and Golombok (2006a,b) studies of single women giving birth with the aid of DI. This result reflects the pronatalist ideology of the Israeli society in which not being a parent is not an acceptable option (Remennick, 2000). Accordingly, since unlike in other countries, fertility treatments of all types for all women in Israel are accessible and funded by the sick funds, women are willing to pursue long-term and burdensome treatments even when the chances to succeed are very low.

Except for four of them, they have never been married, and despite the explicit wishes of some of them to still find a partner, none of them have changed their family status since giving birth. Almost 18% of the women in the sample, however, live in a joint household with their lesbian partners. Thus, although for various legal and financial purposes, they are viewed by the authorities as single, these mothers actually have a partner to share the chores of parenthood.

Nonetheless, two-thirds of the women in the sample raise their children alone. That the task of lone parenting is demanding and is best shown by the fact that 16% of the women felt the need to change their living arrangements, since they became mothers in order to get help with raising their children. This result is congruent with the claim of Albelda et al. (2004) that being the only adult in their family in charge of childcare and income generation, these mothers have to rely on a range of support mechanisms. As the mothers shared with us, they indeed need much help, such as daily taking care of the children or regularly baby sitting for them, or receiving financial help, and are aided particularly by their parents. Some of the mothers said that although they enjoy their motherhood very much, they did not think how demanding the role of a single mother will be. Two of the participants who gave birth to twins were helped by full-time paid help.

Given the age of these single mothers, the tasks to be fulfilled by their elderly parents, mainly widowed mothers, may be viewed from different perspectives. On the one hand, whether living in a three-generation household or in different but closely located dwellings, the parents’ commitment to take an intensive part in the process of raising their older daughters’ children may give them a meaningful role in their lives as retired individuals. On the other hand, the duty to assist as an ongoing task may be perceived by some of them as a growing burden. In those cases where the single mother had moved back to her parents’ home, there may be views according to which the three-generation pattern of living benefits all of the family members. The elderly parents do not live alone, and in an emergency situation, there is somebody to take care of them. At the same time, being helped, the single mothers may invest more of their time in income generation because they know somebody they can trust takes care of their offspring, while the children enjoy attention not only from their mothers. From a psychological point of view, there is a difference whether the children grow up completely alone with a single mother or have other relatives in their daily surrounding. On the other hand, there may be views according to which it is less advantageous for both the elderly and the child to grow up in a three-generation household with a single mother, especially when the grandparents are old and unhealthy, and the mothers are working full time. It should be noted that at least one mother shared with us her difficulty to take care of both her child and her old and ill parents, and another noted that her child felt abandoned when her parents in whose house they lived went away to visit the family of their other child for a month or so in a different country.

The finding that over three quarters of the participants in this study are college graduates is in accord with the findings of Murray and Golombok (2005a,b). It shows that the option of motherhood with the aid of advanced human reproduction technologies is either more appealing or more feasible for women with higher education, and probably also higher income.

The percentage of religious women choosing the option of single motherhood with the aid of sperm donation discloses again the importance attached to the status of motherhood in Israel (Kahn, 2000; Remennick, 2000).

Conception-related variables
Taking advantage of the almost free and unlimited access to all types of fertility treatments in Israel for women until the age of 51, the women in this study did not give up their attempts to become mothers when DI cycles did not prove successful. The need for both sperm donation and IVF for 60% of the sample resulted in 62 formally single women giving birth to 74 children in their first birth. Over two-thirds of them did not have a spontaneous birth, thus hinting that their births necessitated pervasive medical intervention. The fact that about 20% of the first births were twins reflects the gynecologists’ approach to implant numerous fetuses in older women’s uterus. Although it would seem that having to raise a child alone in older age may be strenuous, for some of the women in the sample having achieved motherhood in itself was not fully satisfactory. Perhaps in view of the average number of children in the Israeli family (approximately three children), there were women in the sample who made further attempts to conceive. Their reasoning for making this decision was that they wanted their child to have a sibling, and thus to have a larger family. Two of these attempts resulted in giving birth to twins.

Some of the latter women have used frozen sperm from the same anonymous donor in both occasions. In these cases, the siblings share one genetic father. In other cases, where the mother did not think at her first attempt to become a mother that she will wish to have a second child, and did not save sperm from the anonymous sperm donor for additional potential pregnancies, she had to choose another anonymous sperm donor for her second attempt to become pregnant. In these
cases, the resulting siblings from two births do not share a genetic father. Nonetheless, this sample shows that single-mother families created with the aid of a variety of fertility treatments may consist of more than a mother and one child.

**Mothers’ and children’s health**

The data regarding this sample reveal that there might be a divergence between a self-assessed health report on a scale and the health condition as imparted in a conversation. This divergence may stem from different perceptions of the term ‘health’ (Blaxter, 2004). As Blaxter explicated, the term of health has different meanings for different people; for some ‘health’ means not to feel ill, for others it means to lead a certain style of living, whereas for others it means to feel psychologically well. Thus, the women in the sample whose chronic disease or handicap is under control may assess their health as very good. However, the types of diseases mentioned by the participants raise the question how candid, regarding their health condition, they were with their physicians when applying for fertility treatments. Perhaps their wish to become mothers led them to conceal some of their health problems. Nonetheless, the fact that about one quarter of the sample was willing to share that they are on medication due to various chronic diseases, some of them conditions they had before their pregnancies, and others resulting from them, while in congruence with studies on the poorer health of single mothers (Weitoft et al., 2000; Whitehead et al., 2000; Franz and Lensche, 2003; Roos et al., 2005), raises some concerns about the mothers’ long-term ability to raise their children as single parents.

As to the children’s health, the large majority of the children born to this sample of older single women seem to enjoy good health. However, in congruence with the literature concerning children born following IVF (Hourvitz et al., 2005), in this sample too there is a significantly high rate of congenital malformations and developmental problems. The meaning of this result for those older mothers who have to cope with their children’s health problems as single parents cannot be brushed away. Considering the lower weight at birth of twins and the rate of their disability in the sample, for some of the participants in the study, the task of raising the children is more than challenging.

**Children’s socio-emotional development and mother–child relationship**

In general, in congruence with other studies (McCallum and Golombok, 2004; Murray and Golombok, 2005a,b), the mothers in the sample perceived their children as well adjusted. The children have shown much interest in and were reported to function well at kindergarten or school. Very few of them had difficulties with their teachers and the majority of them did not experience any problems with their peers. However, the mothers’ reports that 16% of the children had experienced some difficulties in their relationships with peers, and that twins were significantly more exposed to being picked on or bullied by other children, may explain the correlation between mothers’ pleasure from motherhood and the children’s social behavior. Despite their pleasure from motherhood, the task of having to manage full-time work with raising alone the children, some of whom having behavior problems, may be the reason for one-fifth of the mothers to occasionally lose their control and try to hit or hit their children. The difficulties and special needs of the single mothers in the sample who must fulfill not only the functions of mother and breadwinner but also those of a father may be another reason for them occasionally to lose control.

In summary, the findings of this study of families of older single mothers assisted by sperm donation provide a rather complex representation regarding the characteristics of the lives of these women and their children. Among others things, they demonstrate the variety of living arrangements of these formally single-mother families. In contrast to the small samples of Murray and Golombok (2005a,b) which did not include single women who gave birth using IVF in addition to sperm donation, women who due to IVF gave birth to twins, or women whose children were born with malformations or suffered from developmental problems, this sample of older single women shows that single parenthood with the aid of sperm donation may involve more complicated situations. Moreover, although the issue of father absence in this study was not directly addressed, and the majority of the children in the sample are still very young, the implications both for the mothers and the children arising from the fact that the children grow up in a fatherless family cannot be totally ignored. Furthermore, in view of the special needs of about half of the sample, it is quite plausible that at least some of these single-mother families will need more public support as the mothers and children get older.

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**References**


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