Comment on Ruhm and Waldfogel: “Long-Term Effects of Early Childhood Care and Education”*

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The empirical literature on early childhood interventions has grown rapidly in recent years, and such interventions have entered the policy agenda in many countries. While there are a number of recent reviews of this many-faceted literature (e.g. Blau & Currie, 2006; Almond & Currie, 2010; Baker, 2011), Ruhm and Waldfogel distinguish themselves first by focusing on large-scale interventions available to the general population, rather than the targeted programs that receives a lot of attention in previous literature. Reviewing the rapidly evolving literature evaluating parental leave and early childhood care and education programs, they focus in particular on studies that inform on the long-term effects on children from these programs, evidence that is just starting to become available. This nicely complements previous reviews and will be very helpful to provide a broad view into the literature, both across interventions and a wide range of countries.

In general, there are two main issues that need to be resolved when evaluating empirical studies. First, can we trust the estimates to be correct for the population under study? This is the question of *internal validity*, and is arguably the central problem in empirical analysis. For instance, children who attend and do not attend child care are likely to be different on dimensions that are both observable and unobservable to the researcher. Comparing outcomes directly, we then run the risk of mixing up the effects of child care with the underlying differences that are determining child care attendance itself. This is a fundamental problem that requires great care by the researcher. Ruhm and Waldfogel discuss important ways that have been used in the literature to alleviate this problem, and focus their review on studies that have taken care to deal with it.

The second issue is whether estimates are applicable to other populations than the one actually under study. That is, are they *externally valid*. In practice, policy makers will need to extrapolate from studies of a particular time or event, and

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often from countries or populations that are quite different from the intended recipients of policy. Further, policy makers will often want to implement policies that differ in potentially important ways from the policies that have been studied in the literature. It is therefore of central importance to understand and be critical as to how the effects of a policy may depend on its particular features and the target population. This is the focus of the current paper.

1 The case for heterogeneous effects

There are several reasons to expect heterogeneity in the effects of early childhood interventions.\(^1\) First, there may be differences in the programs implemented. In particular, there may be important differences in the educational content of the program, the targeted population and the actual population affected by the program. Second, there may be differences in the effects of the same program in different populations. For instance, we might expect that the effect of introducing a child care program on children’s development is quite different depending on whether the program is voluntary or mandatory and depending on the age profile of the users.

In particular, the size and even direction of the effect of a child care program may depend crucially on the counterfactual mode of care, i.e. the mode of care the child would attend if the program had not been introduced. Following Blau & Currie (2006), there are three main modes of care.

1. Parental care
2. Informal out-of-home care
3. Formal out-of-home care

Depending on the particular program and context, a child care program that successfully offers or promotes formal out-of-home care, may therefore shift children either from parental care to formal care or from informal care to formal care. Similarly, a program that successfully promotes parental leave-taking may shift children from formal care to parental care or from informal care to parental care. The impact on child development or maternal employment would be expected to differ substantially depending on what shift is the most salient. Which shift is most salient is in turn likely to be highly specific to the policy under study, depending for instance on the age of the children targeted or affected, the nature of the program and the coverage rate of formal and informal care prior to the implementation of the program.

An important path to heterogeneity in the impact of child care programs is therefore the parental choice of care prior to the reform. To be specific, say that

\(^1\)I phrase in terms of child care, though only slight rephrasing should be necessary to apply this to parental leave.
parents invest in their children’s “quality” $q$ by trading off a numeraire consumption good $c$. For instance, parents could invest in children by decreasing labor supply, by paying for higher quality out-of-home care, or by purchasing child goods.

Taking into account the sacrifice in terms of foregone consumption necessary to create an additional unit of child quality, the left panel of Figure 1 draws the set of feasible combinations of consumption and child quality. As for the standard production possibility set, this consumption frontier is decreasing and concave, reflecting both the fact that investing in additional units of child quality is harder as the quality level increases, and that the value of consumption is higher the less we are initially consuming due to child investments.

Consider now the impact of a reform that subsidizes formal out-of-home care. By subsidizing formal care, the government essentially subsidizes care of a particular quality. This introduces an alternative consumption frontier which is included in the right panel of Figure 1. As long as the price of formal care is still positive, parents must forego some consumption to enroll their child in formal care. Therefore, for a family that initially prefers no investment in child quality, located at

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2This framework is introduced in Havnes & Mogstad (2010). The model builds on the seminal writings of Becker (1964), who introduces the term child quality as an aggregate of the cognitive and non-cognitive determinants of a child’s measurable well-being as an adult.
the intersection of the old frontier and the vertical axis, the new frontier will lie below the former. This implies that some parents will not enroll their children in formal care, in which case their children is not affected by the reform. In Figure 1, families who are initially located left of the point $A$ are not affected by the reform.

Since the program is subsidized, the price of formal care is lower than the price of similar quality care elsewhere. For a family that initially prefers the same quality of care as offered in the subsidized program, therefore, the new frontier must lie above the former. The new frontier must therefore cross the former from below. For families who are initially located north-east in Figure 1, this implies that the relative price of child investments in terms of foregone parental consumption is lower in the formal program than in the alternative. If they opt into the formal care, then parents in this region experience a strong substitution effect, and therefore invest more in child quality. This is illustrated in the figure by the shift from point $A$ to $A'$. For parents who are initially located immediately to the right of $A$, this argument shows that subsidizing formal care should have an unambiguously positive effect on their children’s outcome.

Finally, opting into subsidized formal care implies locking quality of care at the level offered in this program. Relatively affluent parents that care relatively little for their own consumption, would initially choose to invest heavily in child quality. For these parents, formal care may be of lower quality than what they would otherwise provide. Depending on how easily parents can offset a lower quality of care with other child goods or investments, the new frontier may therefore cross the initial frontier a second time. The previous arguments now obviously work in reverse: In Figure 1, families who are initially located right of the point $B$ do not opt into the subsidized program, and are therefore not affected by the reform. Parents who are initially located immediately to the left of $B$ opt into the program because of the low price, substituting some child quality for consumption. For children from these families, subsidizing formal care should have an unambiguously negative effect on their outcome.

In sum, the lower panel of Figure 1 draws the predicted effects on child outcomes of subsidizing formal care. For very low or very high levels of child quality, parents do not opt into the formal care program, and effects are zero. In the intermediate region, effects are positive in the lower parts of the distribution, then decrease in size as the initial level increases, turning negative at the top.

## 2 Preliminary empirical evidence

There is a strong theoretical case for important heterogeneity in how subsidizing formal care affects children’s outcomes. The empirical literature on how child care affects children’s outcomes has so far been understandably focused on the plausible identification of mean effects. There has therefore been little attention paid to uncovering heterogeneous effects of child care.

However, differences in the counterfactual mode of care may be one explanation for the conflicting results found in parts of the literature. For instance, the
impacts on maternal employment suggest that the estimates found by Baker et al. (2008) derive about 50% from children who are shifted into formal care from informal out-of-home care, and 50% from children who are shifted into formal care from parental care. In comparison, the estimated effects in Havnes and Mogstad (2010; 2011) can be interpreted as being driven almost solely (96%) by shifts from informal to formal out-of-home care. It should therefore not necessarily come as a surprise that the effects in the latter study paint a brighter picture of how child care affects children’s outcomes than the former (though, as emphasized by Ruhm and Waldfogel, this may not be the only reason for such a difference).

In Havnes & Mogstad (2010), we deal explicitly with how the effects of child care may vary systematically over the distribution of the outcomes. Specifically, we ask how the introduction in the late 1970s of subsidized child care available to the general population in Norway, affected the entire earnings distribution of children in their early 30s. Applying the methodology suggested by Firpo et al. (2009) in a difference-in-differences setup, we are able to recover an estimate of the counterfactual earnings distribution that would have prevailed if subsidized child care had not been introduced. In line with the discussion above, we find that subsidized child care raised earnings in the lower and middle parts of the earnings distribution, but that these effects taper out and turn negative at the upper end of the earnings distribution. While effects are positive over the bulk of the earnings distribution, the negative effects at the very top turn out to be sufficient to offset these gains, so that the mean effect on earnings is in fact negative.

To understand more about why we observe such large differences in the effects, we also estimate how the introduction of subsidized child care affected the earnings distribution in several different subsamples. Not surprisingly, estimates confirm that the impact is generally positive in subsamples that are overrepresented in the lower parts of the earnings distribution, such as among females and among children from lower socio-economic backgrounds, while they are less positive or negative in the converse subsamples. However, we also demonstrate that effects exhibit the same heterogeneity within the subsamples as in the full sample. For instance, among children from high-educated families, it is still the case that it is the lower part of the earnings distribution that is lifted, while the upper part is depressed. This emphasizes that the heterogeneity in how child care affects outcomes is complicated, and may be related to characteristics of the child that are unobserved to the researcher.

3 Concluding remarks

The empirical literature on early childhood interventions in general and child care and parental leave in particular, has provided important knowledge about how they may affect children’s outcomes. It has shown that such interventions can be an important determinant of children’s development.

A large and highly credible literature based on randomized experiments has shown that intensive, targeted programs can be very beneficial in the long run.
However, while effects on early cognitive test scores are generally substantial, these effects tend to dissipate over time (Knudsen et al., 2006). Lack of cognitive effects in the medium and long run suggests that the cognitive channel may not be the main mechanism behind the effect of these targeted programs on long-run outcomes such as income, education and criminal behavior. This has led to an increasing interest in determining the impact via an alternative non-cognitive channel (Heckman et al., 2005). This research will hopefully contribute importantly to our understanding of how and when early childhood interventions may have positive effects for children’s development.

The recent literature surveyed by Ruhm and Waldfogel, shows that also large-scale programs available for the general population can have benefits for children in the long run. While the evidence is much improved in recent years, our knowledge is still rather limited and superficial. This is particularly evident due to the strong heterogeneity predicted by both theory and the preliminary evidence. For instance, we still know little about the effects for children below the age of three. We also know little about what determines the quality of the program itself. For instance, there is a lack of plausible evidence on how the learning through play emphasized in the social pedagogy tradition in the Nordic countries performs compared to the structured learning programs often found in the Anglo-saxon kindergartens. The scope for further research is therefore considerable.

References


