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MISUSING AGGREGATE DATA: THE CASE OF CHILD CARE IN AUSTRALIA

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If you open that Pandora's Box, you never know what Trojan 'orses will jump out (Ernest Bevin, quoted in Barclay 1975: 32).

Economists share a common weakness, perhaps motivated by an implacable desire to display their own cleverness. They can't seem to resist the temptation to demonstrate that commonly held beliefs and perceptions are incorrect. A skilled economist can try deftly to convince a gullible public that the truth of a matter is in fact diametrically opposed to common wisdom. This self-selected trait within the economics profession can be sometimes useful. It implies a genuine reluctance to accept assertions at face value simply because they coincide with popularly held beliefs. Unfortunately, it can also lead economists, when faced with uncongenial opinions, to try to retrofit an argument, or an interpretation of evidence, so that it leads to a preferred result. A recent piece of economic analysis focusing on the issue of child care (Davidoff 2007) seems to reflect this tendency.

The paper by Davidoff, appearing within the widely consulted *Treasury Roundup*, is in and of itself of no lasting importance. The odds are that it may soon be forgotten. Its significance is as a response to recent media articles spotlighting a lack of child care facilities and problems of affordability¹. These articles sought to focus critical attention on what appeared to be a federal policy failure. Whatever the exact motivation of the author might be, Davidoff's article empirically dismisses these media claims as a chimerical concatenation of anecdotes.

¹ Typical headlines include "Child-care numbers are big and scary" (Gamaut 2006, p.2) or "\$100 a day cost of child care" (Gough 2006, p.:1).

The problem with the work itself is that the analysis that Davidoff offers, when carefully evaluated, says little if anything useful about the vital issue of child care. As a rule of thumb, any reader must be suspicious when an author dragoons aggregate data to examine what are essentially distinct and specific markets. Such a practise is particularly fraught in policy analysis because empirical work of this type may be seized upon for political purposes. These purposes include downgrading or inflating the importance of any given issue. Our own purpose in this article is not to provide an alternative analysis of child care policy – or even to criticise unduly Davidoff's² paper – but to use it as an example of the dangers of such statistical strategies and the ways in which these problems can be best spotted.

Shaping the Debate

Based on the best available recent evidence, child care in Australia remains accessible and affordable at the aggregate level (Davidoff 2007: 80).

After years of receiving peripheral notice (mostly through programs to assist working mothers), the problem of child care provision in Australia has recently graduated to the status of a crisis, at least if measured by media attention. The problem is that, having achieved this desired elevation, little solid evidence and economic analysis is available on this newly spotlighted subject. Instead, as is often the case, anecdotes and assertions generally fill the void. In fact, only recently (Doiron and Kalb 2005) has there been some indication that demand for child care services may be relatively unresponsive to price changes. This lack of empirical evidence is not simply an academic issue, since knowledge of the underlying price elasticities remains a key to any reliable evaluation of child care policy.

Ian Davidoff of the Australian Treasury has stepped into this breach by analysing and interpreting some of the available data on child care

2 A thorough or even detailed knowledge of Davidoff's very straightforward paper is not essential to follow the line of our argument. All one needs to realise is that Davidoff is testing whether an affordability and availability problem exists in the Australian child care market. To pronounce on this question Davidoff employs existing aggregate data.

provision³. His paper purports to demonstrate that Australia's child care market is meeting Australia's child care needs. What it really demonstrates is how difficult it is to draw any useful conclusions from aggregate data. Drawing conclusions is particularly dangerous when such empirical work is used to shape policy decisions. Government programs cannot cater for a statistically average child or a median family, since such concrete examples of these artefacts are scarce on the ground. The needs that must be met arise from actual children residing in distinct and separable markets. Instead, incisive policy initiatives require a clear and in-depth analysis of markets as they are, rather than focusing on their idealised counterparts. Davidoff makes the implicit assumption that there is an Australian market for child care, in much the same way as there is an Australian market for cars. This shortcoming is then compounded by proceeding as if 'a market is a market'. It is true that the same supply and demand analysis can be utilised in understanding any given market. But sometimes, idiosyncrasies that distinguish one market from another can be more important than any underlying similarities. A 'one size fits all' approach will only mislead policy makers.

The problem with Davidoff's work is two-fold. He fails to recognise information and agency problems that distinguish child care provision and which can lead to unsatisfactory market outcomes. He also fails to recognise to any adequate degree that questions of access or affordability are insufficiently answered using his broad based data.

The ABC of Child Care⁴

Suffer the little children to come unto me, and forbid them not: for of such is the kingdom of God (St. Mark ch.10, v.14).

Contractual economic relations can be divided into two major categories. One focuses on property rights and usually defines a relationship between

3 Davidoff's data sources are drawn from the Australian Bureau of Statistics, the Department of Family and Community Services and Indigenous Affairs, and the Household Income and Labour Dynamics survey.

4 The structure for understanding child care presented in this section has been developed by the authors over the past dozen years in a series of conference papers.

humans and things. The other entails agency issues between humans. Both are defined by contracts, whether explicit or implicit. And all contracts simply define the requisite property rights accorded to all relevant parties. However, in one case people purchase the property rights to physical assets which in turn yield future service flows. In the other, people hire agents to accomplish or provide objectives they themselves do not wish to perform. To understand child care issues we need to dissect the underlying relationship between parent and child.

No matter what rhetoric attaches to parenthood, too much parenting in practise treats children as though they were parental property. This becomes the foundation for short-sighted policy debates. For example, the child care debate in Australia has focused disproportionately on the storage question – working mothers needing somewhere to park their children when they are away from home. The policy emphasis then comes to focus on ensuring that there are sufficient places to store children at rates that don't undercut incentives for women to be active members of the working population⁵. In this case the young child is treated as a privately held piece of property. Parents employ agents to insure that their property is not damaged. Child care workers are then not dissimilar in their duties to security guards. They perform tasks that involve minimal training. Both provide little value added by doing so, at least as measured by market estimations. This would explain the low wages accorded to security guards and child care workers alike. In fact for years, Australian politicians have seen child care as a problem of babysitting (storage)⁶. Thus informal child minding was roughly equated to the use of long day care centres or family day care. It was simply a matter of returning the child undamaged at the end of the day. To the extent that

5 By policy debate, we are referring to the nature of the political debate. Though professional practitioners as well as academic researchers may stress issues of quality, it has had over the years little impact on actual government policy or debate. The child care policies in the 2004 election offered by the major political parties focused on availability and affordability. In most other elections, the issue of child care barely received a mention. Former Federal Minister Larry Anthony (who held the relevant portfolio) consistently spoke of child care as the equivalent of baby-sitting. Even at the state level, regulations are keyed to safety issues and costs as would be expected when property rights aspects are uppermost. Recently there has been just the beginning of a shift with Federal Labor under Kevin Rudd recognising the value of pre-school education.

6 The political child care debate in the 70s and 80s paralleled a rising feminism in Australia and an increasing participation rate by women in the workforce.

parents are willing to substitute one form for another as relative prices change, they too are simply focusing on the storage issue.

However, this misses an alternative explanation of the parent/child relationship. Parents can be viewed as agents that society employs to help children to become contributing and valuable members of the community. In rough terms this means earning income and paying taxes rather than receiving welfare or being incarcerated in prisons. The higher skilled these future citizens are, the higher income they earn and the more taxes they subsequently pay. Parents then are accountable for their children's outcomes to some extent. To increase the probability of favourable results, parents must oversee their children's education. In that case, one key factor in achieving educational success involves ensuring that children entering school are ready to learn. This is what quality child care is about⁷. It is not so much an issue of any specific learning that may occur at a tender age, but rather that children find learning easier because they have been taught to listen, cooperate with others and pay attention⁸. Children missing out on such benefits are likely to have more difficulty adjusting to school. This difficult adjustment can cause children to fall behind in their work and react to their failure through disruptive behaviour. Notice that the cumulative nature of this process makes it increasingly costly to correct these failures as the child gets older. Taken to the extreme, the issue is whether it makes more sense to provide quality child care places or cells in correctional facilities.

The argument may be compelling by itself, but it also is empirically supported by an increasing number of latitudinal studies that have demonstrated the available positive returns that flow from investments in quality child care (See Appendix A). The relevant conclusion is that policy needs to steer away from a simple-minded storage strategy and instead focus on the quality of child care that is on offer. Otherwise we accept an approach that would be similar to judging medical care solely in terms of quantity. Bad medical care can be worse than no care at all if medical misdiagnosis and

7 For a good survey exploring the economic benefits of child care see Currie (2001).

8 Currie (2001:214-215) argues that quality child care provides a child with cognitive skills, school readiness, and social and emotional development. Of these three, perhaps school readiness remains the most important. School readiness means that young children are: physically healthy, rested, well-nourished, able to communicate needs, wants and thought verbally, enthusiastic and curious when approaching new activities, comfortable with taking turns, and finally capable of sitting still and paying attention.

careless procedures make patients worse.

The problems associated with child care are even more complex than those involving medical provision. Both share the core difficulty of asymmetric information. Put simply, the purchaser of the service isn't fully qualified to judge its quality. Most parents would be unclear as to what quality child care is, what its objectives are, or how you would measure results. To this serious difficulty we then must add the separation of buyer from user. Parents pay, children use. Parents by definition are absent from child care facilities and unable to monitor events. Children, especially those under two, are unreliable sources of information on the quality of care received. Being experiential in nature, difficulties arise with the market provision of such selected services. Without clear knowledge of the nature of quality care or the ability to judge whether it is given, the market left to its own devices is unlikely to provide the level of care desired by communities. Added to these informational difficulties is an inherent conflict of interest common to all agency relationships. Despite the fact that most parents may want the best for their children, the incentives and objectives motivating parents are not so clear cut. There are inherent trade-offs as parents must sacrifice other goals in order to ensure quality child care. In practise, parents might opt for cheaper but lower quality care, as well as a centre that is more conveniently located. They might substitute informal care arrangements for more formal ones. In other words, they may choose basic baby sitting over the chance to ensure that their children are school ready.

Davidoff's analysis ignores the issue of quality, after noting in passing the benefits of formal child care (2007: 68). However, creating child care places is not necessarily correlated to creating quality care. The absence of such care would be a crisis in itself that might require policy alternatives. Putting these vital quality questions to one side and looking at child care purely from the standpoint of storage facilities, other pressing concerns still warrant attention.

Does Data Speak for Itself?

Insistence on a concretely quantitative economics means the use of statistics of physical magnitudes, whose economic meaning and

significance is uncertain and dubious ... In this field, the Kelvin dictum very largely means in practice, "if you cannot measure, measure anyhow!" (Knight 1956: 166 n.10).

The inherent weakness in Davidoff's analysis begins with the initial question of whether Australia has a problem regarding the accessibility and/or affordability of child care. Unfortunately, the determination of either condition is never carefully defined. This is not mere quibbling since, without such a clear definition, we cannot determine whether current child care policy is successful or even adequate.

The initial analytical problem is that Australia does not have a child care market but rather numerous micro markets. The nature of child care limits practical parental search. Most would look at care located either near to home or close to work. Otherwise the opportunity cost of child care starts to rise at a rate that is dependent upon implicit charges for additional travel time⁹. The user cost of such services include little flexibility on the time one can leave work, increased irritability from rising earlier than usual, and the resulting effects on one's productivity at work or affability and patience at home. Using aggregate survey figures, as Davidoff does, means that it is impossible to pinpoint where any such potential difficulties may lie¹⁰. For instance, specific problems of child care access in some Sydney neighbourhoods may be cloaked by more optimal situations either in other parts of Sydney or by the existing supply and demand balances within Brisbane, Perth or Adelaide. Moreover, issues of affordability may or may not be related to income levels of households located in different geographical locations. Just as lack of rain in New South Wales can never be balanced by excessive rain in Northern Queensland, an aggregate evaluation of child care affordability and access can provide little in the way of guidance for policy purposes. This can be demonstrated by a critical consideration of the statistical analysis provided by Davidoff.

Davidoff notes that the use of all types of formal child care has increased for

9 Meeting the set closing time of a centre (usually at six p.m.) largely eliminates the opportunity to stay a little later than usual to catch up on work when necessary. Long commutes in a city like Sydney or Melbourne, plus the unpredictability of traffic, allows for little flexibility. Thus a centre located near to one's workplace may be preferable.

10 For simplification, all the usual caveats about survey material can be acknowledged. However, the problem with Davidoff's analysis is not that he does use survey material but rather how he uses it.

a statistical average child from 19 hours in 1999 to 25 hours in 2004 (Davidoff 2007:70). This increase has coincided with an expansion in government subsidies. However, the stated increase tells us nothing about any definite causal relationship nor specifies any particular changes within the underlying market.

Formal child care is used by families in different situations and for different purposes. Davidoff seems unaware of the frequent lumpiness attached to its purchase. Most formal child care cannot be hired in a continuous stream. The usual convention is to purchase a short day ending perhaps at three p.m. or a long day ending at six p.m. Opening times vary with centres, some opening as early as six a.m. while others not until eight a.m. Some mothers, for instance, work full time and require something of the order of forty (or more) hours of child care a week (five long days). Others may have alternative informal care and only need two or three long days a week. Women working part time, on the other hand, may find that short days suffice. To muddle the picture even more, some women use formal child care to provide themselves with relief from the constant strains of being attached by the hip to young children. So while we can clearly observe that the average hours of care have risen, many feasible scenarios could have caused that same result. An average tells us nothing about the distribution of child care users that underlie it, or the incentives that have caused such a distribution. Averages can mislead as much as they can inform.

Let's then turn to Davidoff's initial analysis of child care access. He defines utilisation rates as 'total child care hours paid for as a percentage of the total hours available' (2007:71). This categorisation supposedly, in his words, pits 'capacity against use'. However, as mentioned previously, many long day care centres do not sell child care by the hour (or in even smaller units) but in a limited number of different packages. While it might make sense to sell such short term demand on a casual basis, availability is often not known until the given day unfolds. Much depends on unscheduled absences.¹¹ More importantly, excess capacity at a given centre may simply reflect hours preceding and following peak demand. These hours though are of little use, since there is unlikely to be discernable demand for an hour or two in the

11 In some cases, users are only guaranteed places if they agree to purchase a package prescribing minimum levels of usage attached to predictable schedules. Otherwise child care operators would be unable to make the most efficient use of their facilities.

very early morning or an hour or two before a six o'clock closing time. Thus a centre may have apparent available vacancies if total hours (number of places times hours open) are matched against hours purchased. In reality, the centre may be incapable of meeting demand during peak periods¹². As a result, it is difficult to evaluate what an utilisation rate of, for example, 85 percent in long day centres or 68 percent in family day care actually measures.

Davidoff is wise enough to acknowledge (2007:71) that such aggregate figures cannot account for potential spatial mismatches. As already mentioned, child care markets are heavily localised. A surplus of places in one suburb may not compensate for an excess demand in another. In explanation, Davidoff refers to an article by Adele Horin (2006), as well as one in the *Australian Financial Review* (2006), which raises the possibilities of excess capacity in the outer Sydney suburbs where commercial land is cheaper versus inner Sydney suburbs where the opportunity cost of constructing similar centres is necessarily higher.

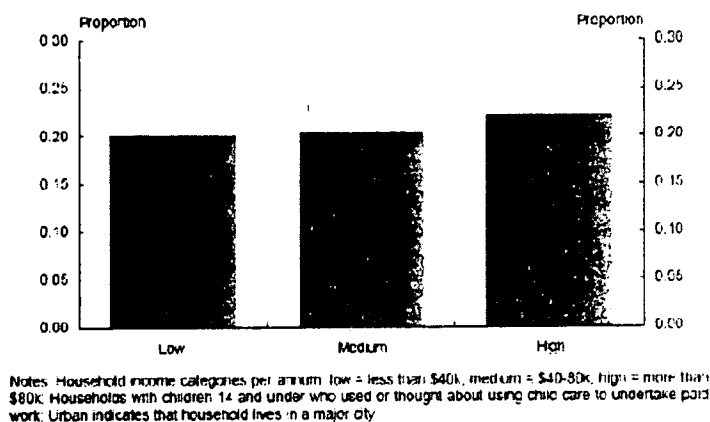
To disaggregate the data and test for a spatial mismatch, Davidoff employs the clever use of a seemingly appropriate proxy. He looks at households according to income (low, medium, or high). Davidoff's inference is that high income earning families are more likely to live in relatively expensive suburbs with correspondingly more costly land prices and vice versa. His empirical evidence indicates little difference between the relevant income groups in the percentage of families reporting access difficulties, as shown below in Figure 1¹³. But what has he thereby demonstrated? Only that in aggregate this problem ceases to exist. But his methodology accomplishes this by bundling together all urban areas. There may in fact be a spatial mismatch in Sydney that is buried by countervailing results in Melbourne and Brisbane. Unfortunately, the availability of child care in Brisbane does

12 In a parallel fashion when we measure power plant capacity, it would be foolish to only focus on total demand while ignoring usage patterns. Excess capacity during late evening periods cannot be transferred to peak periods when demands are measurably greater.

13 It is interesting that some twenty percent of urban households report difficulties in accessing child care. Taking this figure at face value, the difficulty of determining the hurdle rate at which access becomes a problem still remains. Is this twenty percent figure a minor imposition or is it serious? At what percentage would Davidoff recognise the existence of a problem? Davidoff never bothers to define the point at which an access problem could be declared to exist.

nothing to provide access to families in Sydney.

Figure 1: Urban Households Experiencing Difficulties Accessing Child Care (proportion of total urban households)

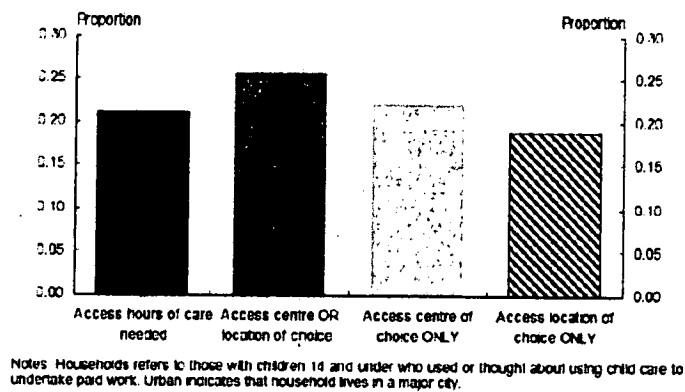


Source: Davidoff (2007: 73)

The accessibility confusion that is at the core of Davidoff's analysis is nicely summed up when he states that 'for many parents, difficulties with securing their preferred type of child care do not preclude them from accessing the amount of care that they require' (Davidoff 2007:74). This statement implies that for some households the storage issue overrides the problem of quality. These parents have somewhere to place their children and no problem in obtaining sufficient hours of care. However, they merely may be making do, given their existing constraints. In a similar manner, the same families may keep their children from going hungry without providing them with adequate nutrition. Households may store their children in a reasonably safe place without receiving much else besides this basic babysitting service. As shown below in Figure 2, Davidoff's empirical evidence (2007:74) indicates that 20 percent of urban households have problems accessing sufficient hours of care, while 25 percent fail to find care of adequate quality or care in a suitable location. From these facts, it would seem difficult to conclude categorically that no child care problem exists, though Davidoff seems

determined to do so.

Figure 2: Households Experiencing Difficulties Accessing Preferred Child Care (proportion of total urban households)



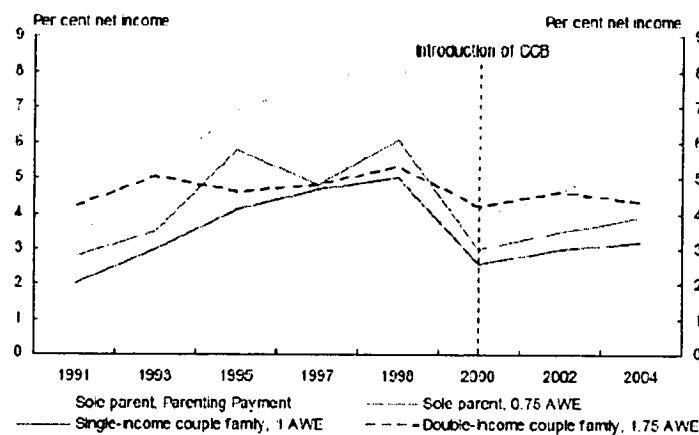
Source: Davidoff (2007:74)

After inconclusively claiming the absence of any serious accessibility problem, Davidoff moves on to the issue of affordability. The fact remains that the cost of child care, once any associated child care benefits have been stripped away, has grown over the last decade by seven percent *per annum*. This represents an increase which is more than double the three percent average inflation rate over the same period (Davidoff 2007: 75). Such evidence alone would seem sufficient to raise serious questions of affordability, even without media headlines touting price tags of up to \$100 for one day of care.

Davidoff (2007:77) attempts to resolve this question by looking at out-of-pocket expenses incurred by four different family categories arranged according to income, as shown below in Figure 3¹⁴.

¹⁴ Davidoff (2007) does not escape the aggregation issue. The affordability problem may be alive in Sydney while being nonexistent in Brisbane. The two regions would be likely to have different income distributions as well as different prices for formal and family day care.

Figure 3: Cost of 20 Hours of Private Long Day Care as Proportion of Net Income



Note: Net income includes any Centrelink payments and allowances which are considered taxable.

Source: Davidoff (2007: 77)

As might be expected, the restructuring of Child Care Benefits (government subsidies) in 2000 evidently restrained the worse deprecation of increased prices¹⁵. In fact, though not negligible, the percentages spent on child care seem generally manageable. The most financially stretched family type would seem to be sole parents on Parenting Payments who sacrifice approximately six percent of their disposable income on child care. Others (sole parent, single income family, and dual income family) are bunched in a range between three and four percent, at least when presented in aggregate. However, a closer look at the data presented (Davidoff 2007:77) reveals some uncomfortable problems. The figures represented are for the median family user, represented by parents who use 23 hours of formal care a

15 One wonders if out-of-pocket expenses are misleading. Subsidies do not appear out of thin air. Tax revenue represents out-of-pocket expenses to the taxpayer. This does allow a degree of redistribution from the users of child care to the non-users but still comprises a societal burden. The cost to society needs to be considered as well out-of-the pocket expenses.

week¹⁶. Unfortunately, when both parents work, a single child would require 40+ hours of day care, which would at least double the spending percentage to eight percent of family income. Another child would increase the burden to sixteen percent, making more serious inroads into the family budget.

Davidoff (2007:77) dismisses this multiple child problem. As he points out, at any given time, 82 percent of families utilising formal day care have only one child in the system. The problem for the remainder may be serious, though Davidoff seems to imply that this 18 percent figure should not call forth any undue concern. However, this figure is merely a snapshot. Though, at a given time only 18 percent of families may have multiple children attending child care, many more families will go through a period of one to three years when they will have to pay for more than one child¹⁷. The impact over time would be considerably more serious for families with multiple children. In addition, child care costs may discourage use by large families who then turn to alternative arrangements¹⁸. This imposed withdrawal from formal care, if large enough, would tend to bias aggregate affordability calculations.

Lastly, Davidoff violates a basic tenet of economic analysis when he evaluates the affordability issue. Rational economic agents make marginal decisions. In the case of child care, this translates into comparing the additional potential income to be earned by a mother returning to work with the cost of the required child care. Davidoff chooses to use combined family income instead¹⁹. The concrete issue for many families is whether the second income earner (in many cases the mother) should return to work or instead

16 To be absolutely accurate, Davidoff uses a sub-median family since he looks at the cost of using only 20 hours a week. This means that more than half of all families pay a larger income percentage than that represented by the provided graph.

17 There has been a rising occurrence of twins within Australia whose child care expense would be maximised over a compact period of time. From personal experience, using full time child care services for four years required some 30 percent of disposable family income during that critical period. The care utilised represented the low to middle range charged for formal day care in the relevant suburbs (close to work or home). This was just before the introduction of the 2000 Child Care Benefits which would make comparable care today somewhat more affordable, though still quite costly.

18 The expense of utilising child care for multiple children would militate against large families. This contrasts with statements by Treasurer Peter Costello urging Australians to have more children.

19 This has been a common practise when analysing child care affordability. Davidoff, like any other researcher, must make do with available data. That however is never an excuse for not clearly recognising the limitations of the data employed.

provide child care herself. Starting from this more practical basis, the additional income that must be devoted to child care, given that mother's earning potential would be, almost by definition, more serious. Wide disparities in income between two parents would increase the impact of this problem. Looking at total income manages to hide this crucial information.

In summary, Davidoff's analysis only demonstrates that child care may or may not present an affordability problem for some families. Those most likely to run into budgetary problems would be families requiring full time child care, especially those with more than one child under five. Whether these families represent a sizeable number, and how many of such families find these costs to be restrictive, remains an uninvestigated mystery.

The Focus of the Child Care Debate

As the child care industry matures, parents' preferences for type and location of care should increasingly be matched by market provision (Davidoff 2007:80).

The perception that Australia has a child care crisis has been driven substantially by those previously mentioned media accounts of \$100 a day child care charges and by tales of waiting lists with hundreds of names. This anecdotal evidence makes for entertaining reading but fails to deliver a definitive judgement on the extent, or even existence, of such a serious problem. However, discussing a mythical national market in which average or even median families cheerfully access affordable child care does not help either. Policy advice should depend upon the actual distribution that underlies those averages and the disaggregated structure of the market itself. We may lack the comprehensive data to do such needed analysis at this time, but that does not excuse using data that is available rather than data that is pertinent.

The analytical problem is made more complex by the issue of quality. As argued earlier, child care is no more a matter of storage than medical care is simply a matter of facilities. We need to understand the key characteristics of child care in practice rather than resort to the assumption that competition will inevitably yield the required level of quality. Empirically, Davidoff

provides no evidence that child care quality has measurably increased over time. Nor does he pinpoint any underlying market incentives that would make such improvement probable. In fact, given the agency and information problems inherent in the child care market, such a conclusion is likely to be untenable. In this case, an unexamined belief in competitive market forces is merely a matter of faith rather than economic analysis.

To provide sound policy advice an economist needs to have a clear understanding of the details, and even the idiosyncrasies, of the particular market involved. Treating all markets alike and employing aggregate data tends to obscure rather than elucidate possible policy problems. Davidoff may be correct about the state of child care, but his analysis does little to support his claims.

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Appendix A

Benefits Derived From Child Care	
Short Term	Improved health and nutrition Prevention of abuse and neglect Benefits to other family members
Medium Term	Preventing the need for special education Preventing grade repetition
Long Term (Possible)	Improvements in schooling attainment and wages Reductions in crime, teen pregnancy, etc.

Some latitudinal studies indicating such benefits are listed below.

The Effects of Early Intervention Programs on Behaviour		
Program	Program Description	Effects
Houston Parent Child Development Centre	Home visits for parent for 2 years; child nursery care 4 days per week in year 2 (Mexican Americans).	Rated less aggressive and hostile by mothers (at ages 8-11).
Perry Preschool Program	Weekly visits with parents; intensive preschool services for 1-2 years.	2-3 vs. 4-6 arrests by age 27; 7% vs. 35% arrested 5 or more times.
Syracuse University Family Development	Weekly home visits for family; day care all year	6% vs. 22% had probation files; offences were less severe.
Yale Experiment	Family support; home visits and day care as needed for 30 months	Rated less aggressive and pre-delinquent by teachers and parents.

Source: both tables are adapted from Currie (2001:223 and 232).

