Welfare Reform: Consequences for the Children

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Abstract

This paper uses register-based data to analyze the consequences of a recent major Danish welfare reform for child human capital and well-being. In addition to work requirements, the reform introduced an upper limit on welfare benefits. The upper limit on welfare benefits was estimated to reduce disposable income for welfare recipients by between five and 20 percent depending on family type. We implement a dynamic difference-in-difference strategy that compares individuals on welfare at the time of reform announcement before and after the implementation of the reform with the development in outcomes for the group of individuals on welfare exactly one year prior. Our results reveal that mothers' propensity to receive welfare decreased only slightly as a consequence of the reform, just as the reform only caused a small increase in labor market participation. Health seeking behaviors were entirely unaffected, at least in the short run. We then show small but negative effects on children's school well-being, as measured by individual-level nationally adminstered well-being surveys and small increases in absence from school because of the reform. Short-run child academic performance, in contrast, was not affected by the reform.

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1. *Introduction*

Over the last few decades, many governments – including the Anglo-Saxon and the Nordic welfare states – have reformed welfare systems with the purpose of promoting work (Grogger and Karoly, 2005; Mogstad and Prozanto, 2012), for example by introducing work requirements backed up by sanctions or by providing financial work incentives. Concerns are raised, however, that while welfare reforms do incentivize some to work, others may simply experience income loss. Moreover, it has long been recognized (e.g. Holmes and Rahe, 1967; Milligan and Stabile, 2011) that both parents and children tend to find shocks to family financial status particularly stressful. As such, welfare reform could have broader implications and affect family members, most prominently children, too. The direction of the effects on child outcomes is ex ante unclear: several papers document that higher income levels (e.g. Dahl and Lochner, 2012; Aizer et al., 2016; Akee et al., 2018) positively affect children's emotional and behavioral health as well as later life human capital outcomes and that early stressors (Almond and Currie, 2010) work in the opposite direction. At the same time, it has proven difficult to establish a causal link between parental (maternal) employment and child outcomes. The empirical evidence on this aspect is non-uniform and varies considerably with age of the child as well as socio-economic background (e.g. Berger et al., 2005; Ruhm, 2004; Ruhm, 2008).

Uncovering effects of various welfare reforms on child outcomes has been challenged by lack of consistent data on relevant child outcomes across age, time, and geographic space; by access to small samples and issues with survey attrition; and by the occurrence of simultaneous reforms. This paper is the first to use population-wide register data informative about parents' welfare participation coupled with a range of other parental and child outcomes across several domains to study a welfare reform that introduced both an upper limit on welfare benefits as well as work requirements. Our starting point is a recent major Danish reform that was passed into law in March 2016 and implemented in October 2016. The reform imposed a substantial change to current policy: if work requirements were not fulfilled, welfare recipients could lose all or part of their benefits. At the same time, the upper limit on welfare benefits was estimated to reduce disposable income for welfare recipients by between five and 20 percent depending on family type (The Danish Ministry of Employment, 2015). The reform not only represented a drastic change, it was also wide-ranging: roughly, 170,000 individuals received welfare benefits at the time of the announcement and more than 30.000 children subsequently experienced a reduction in their families' welfare benefits (Statistics Denmark, 2017).

Relative to the existing literature in the area, we utilize unprecedented high-frequent panel data in a dynamic difference-in-difference strategy that exploits the exact timing of the reform. Specifically, to avoid issues with anticipation we start by selecting the group of mothers on welfare in the month at which the reform was passed into law. Our strategy then compares individuals before and after the implementation of the reform with the development in outcomes for the group of individuals on welfare exactly one year prior. This allows us to speak to the effects of the reform for group of children whose mothers were on welfare at the time of the reform. The key advantages to this approach is that it balances out within-calendar year dynamics in welfare participation. Zeroing in on variation surrounding the timing of the reform also minimizes the role of other, concurrent factors.

We first document that benefit payments did indeed decrease because of the reform but continue to show that mothers' propensity to receive welfare only decreased slightly as a consequence of the reform, just as we only observe a small increase in hours worked. Health seeking behaviors do not at all appear to respond to the reform, at least in the short run. We then document small but negative effects on children's school well-being, as measured by individual-level nationally adminstered well-being surveys and small increases in absence from school because of the reform. Short-run child academic performance, in contrast, was not affected by the reform. Because of the nature of the effects on maternal outcomes, the consequences of for child outcomes are likely a combination of lower access to resources useful for child development (the "resources" channel) and worse emotional well-being (the "family process" channel); see Mayer (1997), Yeung et al. (2002), and Milligan and Stabile (2011). Our large samples naturally allow for a range of subgroup analyses that to some extent can speak to mechanisms behind our findings. We find, for example, that effects on child wellbeing are larger (more detrimental) for children if the mother had a very low attachment to the labor market (<10 hours of work) in the 12 months prior to the reform. At the very least, this group of mothers would have to exercise considerable effort to avoid any sanctions associated with the hours requirement and certainly for them to leave welfare entirely. Effects are also larger for children who live in less stable families (single-parent or non-married households).

Our paper relates directly to a smaller literature concerned with the link between the tightening of welfare services and child human capital development. To the best of our knowledge, most of these are based on the 1990s US welfare reforms that introduced a combination of time limits on welfare receipt, job subsidies, and work requirements. At the same time, this period also saw considerable expansions of the Earned Income Tax Credit that has been shown to independently affect adult labor supply (e.g. Eissa and Hoynes, 2004). Some of the US welfare reforms did undergo experimental

evaluation but data on child outcomes were not universally available and there is evidence of both positive and negative effects on child well-being; see Grogger and Karoly (2005) for an overview. Miller and Zhang (2012) were the first to measure the impact of welfare reform on the educational attainment of male and female children in low-income families using large, nationally representative samples. To estimate net effects of the reforms they use versions of a difference-in-differences strategy that compares children of low-income parents with children of higher income parents before and after the reforms. Their results show that income gaps in school enrollment and drop-out rates narrowed by more than 20 percent as a consequence of the reforms. Experimental results from the Canadian Self-Sufficiency project that offered an earnings supplement with full time work, on the other hand, show mixed results that vary with child age (Morris and Michalopoulos, 2000). Løken et al. (2018), moreover, investigate the consequences of a 1998 Norwegian reform implemented over a period of three years that imposed work requirements and reduced the maximum period of benefit receipt from nine to three years, but also introduced a simultaneous, slight increase in benefit levels. They also use a difference-in-difference strategy that compares single mothers with married mothers. Løken et al. (2018) find no effects on grades in the overall population but statistically significantly negative effects among children of younger mothers.[1] Hence, the existing evidence-base is small, based on varied policy-designs and levels, and results in conflict.

Our paper also speaks to a broader literature that is concerned with the consequences of childhood access to (near) cash welfare via social safety net programs for child well-being and human capital accumulation (e.g. Aizer et al., 2016; Bastian and Michelmore, 2018; Bailey et al., 2020). This literature tends to find gains from access in terms of child human capital accumulation.

We structure the remainder of the paper as follows: Section 2 describes the institutional setting as well as the content of welfare reform in question, Section 3 presents the data, and Section 4 explains our empirial strategy. Section 5 continues to show the results and Section 6 concludes.

2. *The October 2016 reform: Reducing the level of benefits and introducing work requirements*

[1] Recent research has studied welfare reforms related to the immigrant population. Andersen et al. (2019) study a Danish 2003 reform that reduced benefits to refugee immigrants by around 50 percent for those granted residency after the reform date. They show that childrens' performance in language tests as well as length of education decreased as a consequence of the reform, just as teenagers' crime rates increased.

According to the Danish Law of Active Social Policy ("Lov om Aktiv Socialpolitik"), individuals qualify for welfare benefits in case of job loss or prolonged sickness spells if they cannot provide for themselves and their families through other means of income, such as unemployment insurance, or by depleting their assets. Benefits include welfare benefits ("kontanthjælp") but also housing support and special support ("særlig støtte") to individuals deemed by caseworkers to be in particular need. Benefits increase with age above 30 as well as family size and single providers receive a top-up. There has been political (and academic) concerns, however, that the level of benefits did not sufficiently incentivize labor market participation and this has led to series of reforms in the area, with the explicit purpose of promoting work.

We study a recent reform that was passed into law in March 2016 and implemented in October 2016. The reform had consequences for all welfare recipients and consisted of two key components: it imposed an upper limit on total transfers received while on welfare benefits and it required that welfare recipients had worked at least 225 hours (six weeks full time) during the last 12 months for them to remain eligible for benefits. In practice, the counting of hours started in April 2016. The level of welfare benefits remained the same as before the reform and only the housing and special support were affected. The upper limit on total benefits caused a nonnegligible decrease in benefits received: as seen in Table 1, a typical single parent on welfare with two children went from a disposable income of DKK 13,100 before the reform to DKK 10,500 after the reform, corresponding to a reduction of almost 20%.

If the 225 hour work requirements were not fulfilled, participants could lose part or all of their benefits.[2] The strictness of the new policy varied considerably with marital status: if one individual in a couple did not fulfill the work requirements, the individual would not receive welfare. If both did not fulfill the requirements, benefits for one individual would be withdrawn. Once both fullfil their work requirements, they would receive benefits again. A single individual, in contrast, would face a reduction in benefits of DKK 1,000 in case the work requirements were not fulfilled.

[2] Municipalities had some leeway in this matter. Individuals considered by their caseworker to have limited ability to engage in a gainful activity were exempt from the work requirements.

Table 1

Predicted pre- and post-reform disposable income absent behavioral changes, by family types

	Pre-reform disposable income	Post-reform disposable income	Percentage change
Singles			
No children	5,300	5,300	0%
One child	9,700	7,400	-24%
Two children	13,100	10,500	-20%
Three children	16,500	13,100	-21%
Four children	20,500	16,200	-21%
Cohabiting or married couples			
No children	10,700	9,200	-14%
One child	14,500	13,800	-5%
Two children	15,600	14,400	-8%
Three children	17,600	15,300	-13%
Four children	19,500	15,600	-20%

Notes: This table shows disposable monthly income after housing costs for individuals aged 30 or older, DKK 2015. Calculation assumes monthly rent for single without children of DKK 2,801 and DKK 6,138 for other family types. Calculation assumes other costs of housing to amount to DKK 761 and DKK 1,296. In families with one child, the child is assumed to be five years old; in families with two children five and ten years old; in families with three children five, ten, and 14 years old; and in families with four children one, five, ten, and 14 years old. Source: The Danish Ministry of Employment, The Family Type Model, October 2015.

3. Empirical strategy

The goal of the paper is to study the consequences of the welfare reforms for mothers' and ultimately children's outcomes. The starting point for the analysis is the population of individuals receiving welfare in March 2016, corresponding to the time at which the reform was passed into law.[3] This is to guard against issues with anticipatory behaviors but of course, this is conservative because some individuals do leave welfare in the period between the announcement and the actual implementation. To learn about the effects of the reform, we implement a difference-in-difference strategy that exploits the timing of the reform. We first compare outcomes for individuals (mothers or their children depending on the outcome under study) in the analysis population *before* the announcement of the reform (i.e. before March 2016) with outcomes *after*. However, as we document below, there are

[3] We exclude the immigrant population because of concurrent reform of welfare benefits available to this particular group (announced March 2016, implemented July 2016).

clear within-calendar-year dynamics in welfare participation for that are not related to the reform. To account for these and the role of outcome dynamics more generally, we establish a comparison group consisting of the population of individuals on welfare exactly one year prior, in March 2015. In this comparison group, we subsequently compare outcomes *before* March 2015 (i.e. before a synthetic announcement) with outcomes *after*. In cases where we have access to more than one measurement on a particular outcome (before and) after the reform, we implement an event study version of the difference-in-difference strategy and explicitly allow the effects to vary with the temporal distance to the reform.

The main estimating equation for the simple difference-in-difference strategy is the following:

$$Y_{it} = \alpha + \beta_1 after_{it} + \beta_2 reform_i + \beta_3 reform_i \cdot after_{it} + \varepsilon_{it}, \quad t = 1,2 \qquad (1)$$

where Y is the outcome of interest, $after$ indicates outcomes measured after the (synthetic) reform,[4] and $reform$ indicates that individuals belong to the cohort actually exposed to the reform. ε is an error term, i indicates individuals, and t indicates time. β_3 is the parameter of interest, which represents the effects of the reform in the population of welfare participants. Robustness analyses include a conditioning set, X, as well. The dynamic version is a straight-forward extension of (1) with time varying regression coefficients.

The key identifying assumptions associated with our approach are 1) no anticipation and 2) parallel trends in outcomes in the absence of the reform. By anchoring the population prior to the passage of the reform, we limit any issues with the former; by anchoring the comparison group to March 2015, we also minimize any differential within-calendar-year outcome dynamics between the two groups. Where possible, our analyses below will directly investigate differences in pre-trends.

4. Data, samples, and descriptive statistics

Our analyses make use of population-wide Danish register-based data. A unique identification number (the CPR number) allows us to link individuals across registers and also parents to children. Key to our projects is, of course, monthly information about welfare participation, benefit payments, and labor market outcomes such as earnings and hours worked, which we draw from the National

[4] But no later than the spring of the subsequent calendar year when the comparison group would be exposed to the announcement of the reform.

Income Register. To learn about other types of parental responses, we supplement these data with information about health care use, including visits to primary care physicians and psychologist that are, in principle, available on a weekly basis.

In terms of child outcomes, we consider several domains indicative of child well-being and academic performance. Our first measure relates to children's risky behaviors as measured by quarterly school absenteeism. We consider an indicator for any absence as well as days absent. Our second outcome uses indicators of children's wellbeing from the nationally administered school-based individual level well-being surveys developed by the Danish Ministry of Education. These surveys are collected in the spring of each year. In practice, we use the social well-being scale that is collected for children in grades 4-9. ranges from 0-50.[5] Finally, we consider children's academic outcomes. We base these on standardized versions of the nationally administered performance tests in Danish reading and math. The tests are carried out each spring in primary and lower secondary schools starting from grade 2 and are available from the 2009/2010 school year, see Beuchert and Nandrup (2018) for more information. We match all of these types of information with rich demographic data from various administrative registers.

From the National Income Register, we first select the 24,396 ethnic Danish mothers on welfare in March 2016 and link these mothers to their 43,732 biological children aged 0-18. Table 2 shows how this population compares to the overall population of Danish women and their children and clearly documents that the former group is severely disadvantaged in terms of background characteristics and child outcomes. The mothers in are our data are clearly younger, less likely to be married, and more likely to be unskilled. They are also much more likely to have been overweight and to have smoked during pregnancy. Their children have slightly higher school social well-being, much higher

[5] The social well-being scale for children enrolled in grades 4-9 consists of the following ten questions/statements:

a) How well do you like your school?
b) How well do you like the other children in your classroom?
c) Do you feel lonely?
d) Are you afraid of being ridiculed at school?
e) Do you feel safe at school?
f) Since the start of the school year, did anyone bully you?
g) I feel I belong at my school.
h) I like the breaks at school.
i) Most of the pupils in my classroom are kind and helpful.
j) Other pupils accept me as I am.

The responses to all questions are coded to range from one to five, with five being the most positive. For positive questions like "Do you feel safe at school?" the value five is equivalent to "very often". For negative questions like "Do you feel lonely?" five means "never". In this sense, five is always the best outcome. In line with the ministry, we consider the sum of the responses. See Larsen et al. (2020) for a descriptive analysis of the link between social well-being and family, teacher, and peer characteristics.

absence rates from school, and much lower academic outcomes. We subsequently select the corresponding set of mothers on welfare in March 2015 as well as their children aged 0-18. Just above 50 % of the women appear in both groups.

Table 2

Descriptive statistics, mothers and their children

	Women	Danish mothers on welfare in March 2016
Panel A. Adult population		
Age	50.5	35.6
	(18.8)	(7.8)
Female		
Married	0.47	0.16
	(0.50)	(0.39)
Education:		
unskilled	0.47	0.64
	(0.48)	(0.48)
vocational degree	0.31	0.27
	(0.46)	(0.45)
short further	0.04	0.01
	(0.19)	(0.11)
medium length further	0.21	0.06
	(0.40)	(0.23)
long further	0.08	0.01
	(0.26)	(0.11)
# observations	2,237,819	24,396

Notes: This table shows descriptive statistics for Danish mothers on welfare and their children and compares these to the overall population of Danish women and their children. Own calculations based on analysis data.

Table 2 continued

Descriptive statistics, mothers and their children

	All children aged 0-18	Children aged 0-18 of Danish mothers on welfare in March 2016
Panel B. Children's early life		
Birth weight (gram)	3,479	3,349
	(611)	(637)
Birth weight < 2500 gram	0.05	0.08
	(0.22)	(0.27)
Gestational age (days)	278	276
	(14)	(15)
Gestational age < 224 days (32 weeks)	0.009	0.013
	(0.010)	(0.112)
# prenatal visits to midwife	4.9	4.8
	(2.1)	(2.4)
Mother BMI prior to pregnancy	24.5	25.7
	(8.0)	(9.2)
Mother BMI > 30	0.12	0.22
	(0.33)	(0.41)
Mother smoker around time of pregnancy	0.18	0.53
	(0.39)	(0.50)
# observations	1,094,875	43,732
	All children	Children of Danish mothers on welfare in March 2016
Panel C. 4-9 graders, absence		
Any absence March 2016	0.48	0.60
	(0.50)	(0.49)
Days absent March 2016	1.3	2.0
	(2.12)	(2.8)
# observations	325,465	11,806
Panel D. 4-9 graders, social wellbeing		
Social wellbeing spring 2016	40.6	38.5
	(6.9)	(7.9)
# observations	292,372	9,931
Panel E. National test scores		
Standardized reading scores spring 2016	0.064	-0.482
	(1.0)	(1.1)
# observations	134,022	5,914
Standardized math scores spring 2016	0.053	-0.519
	(1.0)	(1.1)
# observations	45,565	1,947

Notes: This table shows descriptive statistics for Danish mothers on welfare and their children and compares these to the overall population of Danish women and their children. The adult population of women consists of females aged 18 or above. Own calculations based on analysis data.

5. *Consequences of welfare reform*

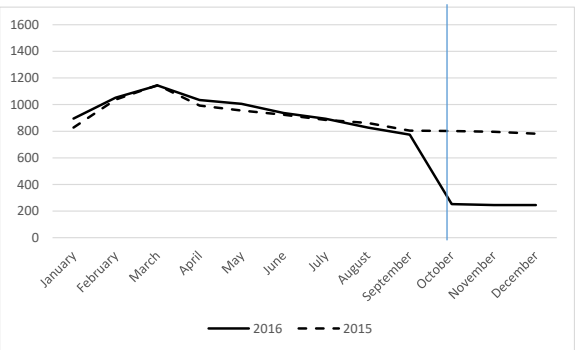
5.1 Characterizing the reform

We first document that individuals on welfare did in fact experience reductions in their benefits because of the reform. As described above, in practice, the upper limit on welfare benefits was carried out as a reduction in housing support. Accordingly, Figure 1 shows receipt of one type of housing benefits, the so-called *special support*,[6] for the population of mothers on welfare benefits in March 2016 and compares this to the population of mothers on welfare in March 2015. The outcomes of the two populations track each other closely from January until October. In October, in contrast, we observe a sudden decrease of more than 20 percentage points in the share of individuals who receive this type of support.

The other component of the reform was the 225 hours requirement. To grasp the importance of this constraint for the population under study, Table 3 documents prior labor supply for the population of mothers on welfare benefits in March 2016 and compares this to the population of mothers on welfare benefits in March 2015. Firstly, mothers on welfare in March 2015 and March 2016 are highly similar in terms of their previous labor market attachment; and secondly, a substantial share works very little; about 80% has worked less than 10 hours during the last 12 months. Accordingly, substantial effort would be required for these women to meet the 225 hours requirement.

Figure 1

Receipt of special support



Note: Figure shows amounts of special support in DKK. 2016 (2015) population consists of mothers of Danish origin receiving any welfare benefits in March 2016 (2015). Blue vertical line indicates timing of reform implementation.

[6] "Særlig støtte" in Danish.

Table 3

Distribution of hours worked during last 12 months

	Danish mothers on welfare in March 2015	Danish mothers on welfare in March 2016
<10 hours	0.779	0.809
	(0.415)	(0.393)
10-50 hours	0.020	0.019
	(0.140)	(0.135)
50-100 hours	0.014	0.016
	(0.118)	(0.126)
100-225 hours	0.030	0.029
	(0.170)	(0.169)
> 225 hours	0.157	0.126
	(0.364)	(0.332)
# observations	27,668	24,960

Note: Table shows the distribution of hours worked during the last 12 months. 2016 (2015) population consists of women of Danish origin on welfare benefits in March 2016 (2015).

5.1 Effects on maternal outcomes

We next shed light on effects on maternal outcomes. The left-most panel of Figure 2 is based on the same populations as Figure 1 but shows the share of mothers receiving any welfare benefits. The right-most figure shows the estimated effects of the reform from a dynamic difference-in-difference estimation anchored in February just prior to the passing of the (synthetic) reform. Note first that the estimated effects of the reform are very close to zero in the months prior to its passing and all estimates are statistically insignificant too. This assures us that our estimation approach actually manages to balance pre-trends and that welfare participants did not anticipate the reform before it was passed into law. From April and onwards, and particularly from October when the reform was fully implemented, we detect significantly negative effects on welfare participation. Effects are small however; the estimate in March 2017 is -0.027, corresponding to 4% of the comparison group mean.

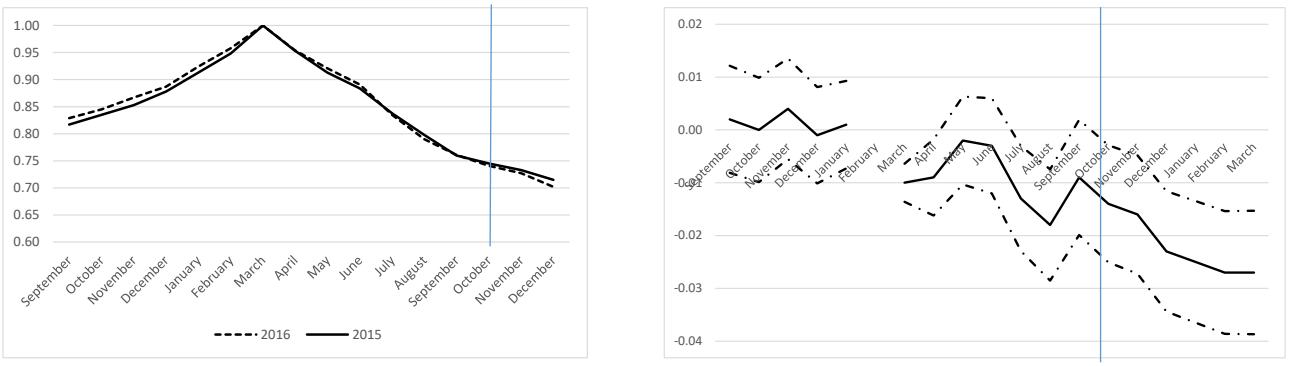
Results on hours worked appear in Figure 3. In line with the findings on welfare participation, we find no effects of the reform before it was passed into law and estimate small, positive effects on hours worked as a consequence of the reform. In March 2017, for example, the estimated effect is 1.5, corresponding to 7% of the comparison mean. To put this into perspective, Figure A1 shows that around 20% of the population of mothers on welfare benefits in March 2016 manage to accumulate

at least 225 hours in March 2017. In short, only a few mothers in this population managed to leave welfare entirely and only a smaller share increased their labor supply to an exent sufficient to avoid the monetary sanctions associated with the 225 hours requirement. The combination of the reduction in benefits through the upper limit, the risk of monetary sanctions, and the lack of any substantial increases in earnings through hours worked *de facto* meant that most families had fewer means available after the reform.

Finally, to learn about the effects of the reform on mothers' mental health Figure 4 explores whether the reform had an effect on health seeking behaviors. We show here the number of contacts to private-practising psychologists or psychiatrists. We detect no effects on this outcome either, though caution should be taken concerning these particular mental health outcomes; there are typically long waiting lists for new patients and especially for the group referred from primary care physicians because they generally imply a lower payment to providers.

Figure 2

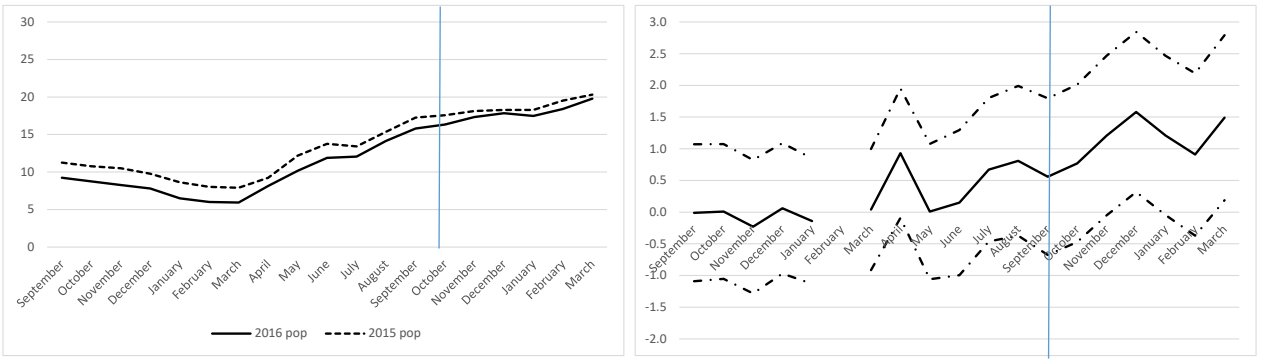
Effects of the reform on welfare participation



Note: Left-most figure shows share receiving any welfare benefits; right-most figure shows results from event study estimation anchored in February, just prior to the (synthetic) reform. 2016 (2015) population consists of mothers of Danish origin on welfare benefits in March 2016 (2015). Blue vertical line indicates timing of the (synthetic) reform implementation.

Figure 3

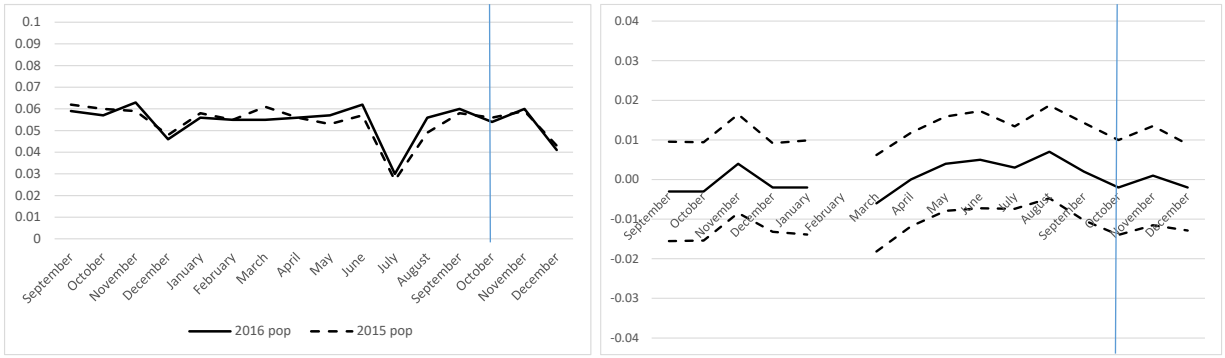
Effects of the reform on hours worked



Note: Left-most figure shows hours worked; right-most figure shows results from event study estimation anchored in February, just prior to the (synthetic) reform. 2016 (2015) population consists of mothers of Danish origin on welfare benefits in March 2016 (2015). Blue vertical line indicates timing of the (synthetic) reform implementation.

Figure 4

Effects of the reform on contacts to psychologists/psychiatrists



Note: Left-most figure shows number of contacts to a psychologist or psychiatrist (outside of psychiatric hospitals); right-most figure shows results from event study estimation anchored in February, just prior to the (synthetic) reform. 2016 (2015) population consists of women of Danish origin on welfare benefits in March 2016 (2015). Blue vertical line indicates timing of reform implementation.

5.2 Effects on child outcomes

Equipped with results on mothers, we finally move on to our findings for child outcomes. Our starting point is a measure of risky behaviors, namely a quarterly indicator of any school absence. Being present at school is a prerequisite for learning, of course. Carlsson et al. (2015), for example, document that an extra ten days of school instruction raises cognitive skills as measured by scores on

intelligence tests (synonyms and technical comprehension tests) by approximately 1% of a standard deviation.

Table 3 shows the formal difference-in-difference results. In parallel to the adults, we consider children enrolled in public school born to mothers on welfare in March of 2016 (2015) to be the treated (comparison) cohort. We find a slight increase in absence due to the reform in the first quarter of 2017 following the implementation of the reform by 1.7 percentage points. This is equivalent to an increase of 2% of the comparison mean; see Table 2, Panel C. Table 3 also documents a concurrent small reduction in the social well-being scale from the nationally administered well-being surveys developed by the Danish Ministry of Education. At this stage, therefore, we conclude that the reform did affect child outcomes, at least within the age range considered here, but that the effects are not large for the population as a whole. Given that the reform did not appear to have large effects on the likelihood of receiving welfare for the adult population, one could reasonably scale our intention-to-treat estimates with the share still receiving welfare arrive at an average treatment effect for those still exposed to the policy. Doing this would increase the result for absence to 2.4 percentage points and the result for social well-being to 0.9 points.

Table 4

Effects of the reform on quarterly absence from school and well-being, Grades 4-9

	Treated cohort	Comparison cohort	Difference
Any absence			
Pre-period	0.839	0.839	0.000
			(0.005)
Post-period	0.857	0.840	0.017
			(0.004)
Difference	0.018	0.001	**0.017**
	(0.005)	(0.005)	(0.006)
N	50,288		
Days absent			
Pre-period	6.37	6.29	0.08
			(0.10)
Post-period	6.91	6.18	0.73
			(0.10)
Difference	0.54	-0.11	**0.65**
	(0.10)	(0.09)	(0.14)
N	50,288		
Social wellbeing score			
Pre-period	38.51	37.94	0.57
			(0.11)
Post-period	38.52	38.57	-0.05
			(0.11)
	0.01	0.63	**-0.62**
	(0.11)	(0.11)	(0.154)
N	41,536		

Note: Treated 2016 cohort (comparison cohort 2015) consists of children enrolled in public school grades 4-9, born to mothers on welfare benefits in March 2016 (2015). Pre-period absence measures any absence in the first quarter of 2016 (2015) for the treated (comparison) cohort. Post-period absence measures any absence in the first quarter of 2017 (2016) for the treated (comparison) cohort. Pre-period social well-being measured in spring of 2016 (2015) for the treated (comparison) cohort. Post-period social well-being measured in spring of 2017 (2016) for the treated (comparison) cohort. Reform implemented during Q4 2016. *Italic* indicates significance at the 10% level; **bold** indicates significance at the 5% level.

Table 4 shows results for academic performance as measured by the national test scores. In contrast to social well-being and absence, we detect no negative effects here. This is maybe not surprising since test scores to a higher degree than social well-being and absence from school reflect skills that accumulate over time.[7]

[7] Landersø et al. (forthcoming) do find that 9th grade test scores are sensitive to the school start age of younger siblings; another type of stressor. The authors argue that this is likely because delaying the school start of a younger sibling

Table 5

Effects of the reform on national test scores, primary and lower secondary school

	Treated cohort	Comparison cohort	Difference
Reading			
Pre-period	-0.481	-0.452	-0.029
			(0.020)
Post-period	-0.516	-0.497	-0.019
			(0.021)
Difference	-0.035	-0.045	0.010
	(0.021)	(0.005)	(0.021)
N	23,983		
Math			
Pre-period	-0.519	-0.474	-0.045
			(0.03)
Post-period	-0.624	-0.613	-0.011
			(0.03)
	-0.105	-0.139	0.034
	(0.04)	(0.11)	(0.114)
N	8,059		

Note: Treated 2016 cohort (comparison cohort 2015) consists of children who sit a national test in the relevant course, born to mothers on welfare benefits in March 2016 (2015). Pre-period scores measured in the first quarter of 2016 (2015) for the treated (comparison) cohort. Post-period scores measured in the first quarter of 2017 (2016) for the treated (comparison) cohort. Reform implemented during Q4 2016. *Italic* indicates significance at the 10% level; **bold** indicates significance at the 5% level.

5.3 The role of prior vulnerability

Much evidence suggests that particularly disadvantaged children are more susceptible to negative shocks. To explore the role of prior vulnerability, we estimate effects by measures of family stability (marital status, single parent) and by mothers' distance to the labor market. We also separately investigate effects by child gender, although the extant literature is less clear about whether boys or girls are more likely to be affected.

There are good reasons to think that effects on the children may vary with the quality of the family environment. To the extent that a stable partner can help alleviate any stress incurred by the reform and assist with means of income, we expect that children in married families are more resilient to

allows parents to redirect resources towards the dimensions in older siblings' upcoming exams that are most easily improved.

reform exposure. This is exactly what we see in Table 6; the decrease in social well-being and the increase in absence are much stronger in the group of children from non-married families. Of course, since more mothers are non-married in the overall population, we have greater statistical power. We do not detect effects on test scores, regardless of the mother's marital status.

We next delve into the importance of mothers' prior labor market participation. In practice, we estimate reform effects by whether the mother had accumulated fewer than or at least ten hours on the labor market during the 12 months prior to the passing of the (synthetic) reform. Effects are clearly driven by children of mothers with very low prior labor market participation. This is not only a question of statistical significance; estimated effects are much larger in this group too.

Table 6

Effects of the reform on child outcomes, heterogeneity

	Mother married	Mother not married	Mother <10 acc hours	Mother >=10 acc hours	Boys	Girls
Any absence	-0.005	**0.023**	**0.027**	0.006	0.013	**0.021**
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
N	10,899	39,389	35,090	10,134	25,604	24,684
Days absent	0.44	**0.71**	**0.83**	0.17	**0.62**	**0.69**
	(0.28)	(0.16)	(0.17)	(0.26)	(0.19)	(0.20)
N	10,899	39,389	35,909	14,379	25,604	24,684
Social well-being score	-0.44	**-0.66**	**-0.73**	-0.47	**-0.48**	**-0.77**
	(0.32)	(0.18)	(0.19)	(0.34)	(0.21)	(0.23)
N	9,096	39,434	28,520	8,512	20,928	20,608
Reading	0.022	0.008	0.031	-0.011	0.000	0.020
	(0.06)	(0.03)	(0.035)	(0.063)	(0.042)	(0.038)
N	5,160	18,823	16,863	4,873	11,986	11,967
Math	-0.027	0.055	0.050	0.020	0.044	0.027
	(0.10)	(0.06)	(0.058)	(0.105)	(0.073)	(0.063)
N	1,733	6,326	5,737	1,637	5,737	4,010

Note: Outcome specific populations and comparison periods defined in Tables 3-4. Reform implemented during Q4 2016. *Italic* indicates significance at the 10% level; **bold** indicates significance at the 5% level.

6. Conclusion

This paper uses register-based data to analyze the consequences of a recent major Danish welfare reform for children's human capital and well-being. In addition to work requirements, the reform introduced an upper limit on welfare benefits. We implement a difference-in-difference strategy that compares individuals on welfare at the time of reform announcement before and after the reform with the development in outcomes for the group of individuals on welfare exactly one year prior. Our results reveal that benefit payments did indeed decrease because of the reform but that mothers' propensity to receive welfare was largely unaffected by the reform, as were their labor market participation and health seeking behaviors, at least in the short run. We then show small but negative effects on children's school well-being, as measured by individual-level nationally adminstered well-being surveys and small increases in absence from school because of the reform. Short-run child academic performance, in contrast, was not measurably affected by the reform.

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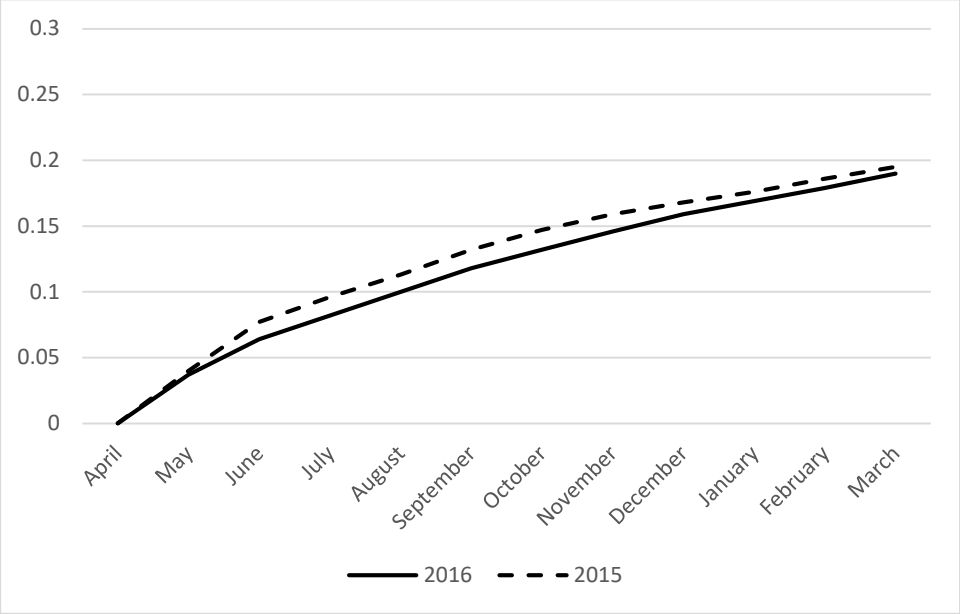
Appendix A

Figure A1

Share of population that has worked at least 225 hours, with counting starting in April



Notes: Figure shows share who has worked at least 225 hours, with counting starting in April; 2016 (2015) population consists of mothers of Danish origin on welfare benefits in March 2016 (2015).