



ARTICLE

# ‘Unprecedented injustice’: Digitalisation and the perceived accessibility of childcare benefits

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## Abstract

The Netherlands recently experienced a crisis in childcare benefits, leading to ‘unprecedented injustice’ for many parents falsely accused of defrauding the childcare benefit system. This crisis highlights multiple barriers in parents’ ability to access childcare already evident prior to the crisis, including the far-reaching digitalisation of social policies and childcare benefits in particular. Digitalisation can make parents feel childcare services are less accessible, thereby creating or exacerbating existing inequalities in childcare use. Parents may also lack the skills needed to navigate complex application procedures, which can affect their perceived access to childcare benefits, particularly in market-led systems with greater reliance on government benefits to cover the high costs of childcare. Extending recent research on childcare capabilities, we investigate the extent to which digital and functional literacy affect parents’ perceived access to childcare benefits in the Netherlands. The results from our exploratory quantitative analysis provide a starting point for understanding the understudied relationships between digitalisation, parents’ abilities to navigate complex childcare or other policy systems, and their (perceived) ability to access childcare benefits. We use these findings to develop multiple future research recommendations in the childcare policy literature.

**Keywords:** capability approach; digitalisation; childcare benefits; functional literacy; digital literacy; perceived access

## Introduction

The Netherlands experienced a government crisis in 2019, after thousands of parents were unfairly and severely financially sanctioned by the Dutch Tax Authority for their supposed fraudulent receipt of childcare benefits. In some cases, parents were required to pay back upwards of tens of thousands of euros (Donner, den Ouden, Klijnsma, Akdemir, & Gosen, 2019; Van Dam et al., 2020). Known as the ‘childcare benefit crisis’, it caused the fall of the government and highlighted crucial problems with the accessibility of online government services, particularly childcare benefits. In the Netherlands, childcare benefits are an income-dependent

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financial reimbursement of childcare costs provided to parents to offset the expense of formal childcare. These benefits, like many welfare state benefits, are increasingly offered as *digitalised* services (Androniceanu, Georgescu, & Kinnunen, 2019). Digital provision presumes access to the internet, access to electronic devices such as smartphones, laptops, or tablets, the ability to use these devices to access and apply for policies and services, and the ability to navigate and understand the online policy environment. These assumptions are problematic, as access to electronic devices and digital skills (including the ability to navigate online policy environments) are unequally distributed throughout society (Baay, Buisman, & Houtkoop, 2015). Moreover, although technology is seen as a potential means of improving social policy service provision, for example in the integrated care agenda (McCall, Hoyle, Gunasinghe, & O'Connor, 2021; Wodchis, Dixon, Anderson, & Goodwin, 2015), it also carries risks of exclusion (Selwyn, 2002). When digitalisation increases the complexity of service provision for citizens, as the Dutch childcare benefits crisis demonstrates, the most vulnerable can become victims to the state who developed and implemented digital services in the first place. In this way, digitally providing social policies and services can reduce rather than increase access.

The digital provision of childcare benefits can also reduce childcare access if parents perceive the application process to be so complex that they do not even attempt to access policies and services. It is widely acknowledged that access to childcare services is already unequal; digitalisation has the potential to exacerbate these inequalities. Structural constraints, particularly those related to differences in socio-economic position (SEP), reduce childcare availability and affordability and create 'Matthew effects' in usage (i.e., parents in middle and upper socio-economic positions, and their children, benefit significantly more from childcare services than parents in lower socio-economic positions (Abrassart & Bonoli, 2015; Lipscomb, 2013; Pavolini & Van Lancker, 2018)). These Matthew effects appear unaffected by measures aimed to increase access to childcare services in countries lacking public childcare systems, such as childcare benefits provided by welfare states aimed at reducing the costs of formal childcare. Perceived access is less understood, despite being acknowledged as an important barrier to childcare use (Boot, de Vos, Pol, & Zonneveld, 2019). Access to childcare, while important for parents, does not equate to equal outcomes because individuals differ in their perceived ability to use resources in valued ways (e.g., Hobson, 2018; Yerkes, Javornik, & Kurowska, 2019). Given the potential for increased inequalities through the digital provision of childcare benefits, greater attention is needed to understand the relationship between digitalisation and perceived access to childcare benefits.

Although digital technology has been increasingly important in the study of the administration, delivery, governance, and substance of social policy (Henman, 2022), the comparative childcare policy literature has yet to account for the ways in which digitalisation may affect childcare access via digitally accessible, government-provided childcare benefits. We provide an exploratory empirical investigation of the relationship between digitalisation and parents' perceived access to childcare services in the Netherlands, building on the salient cross-country childcare literature highlighting problems associated with childcare availability, affordability, and quality (Plantenga & Remery, 2015; Roeters & Bucx, 2018; Yerkes & Javornik, 2019). The Netherlands is a particularly salient case study for investigating this

relationship, given high levels of digitalisation, a heavy reliance on market-based childcare services, and the recent government crisis related to the provision of childcare benefits. Using data from a cross-sectional survey among parents in the Netherlands, we investigate parents' understanding of the childcare system and their digital skills in relation to perceived access and whether this differs across educational levels (as a proxy for socio-economic position). To the best of our knowledge, this is the first study to focus on the accessibility of digitally provided childcare benefits as a crucial component of parents' perceived access to childcare services. Against the background of digitalisation trends (Androniceanu et al., 2019) and the absence of research on how these trends affect the accessibility of social policies, this article provides initial insights into the relationship between digitalisation and parents' access to childcare services, and thus the extent to which digitalisation potentially creates or sustains social inequality.

### Childcare services in the Netherlands

Childcare services in the Netherlands, intended to stimulate employment and children's development, are market-based and expensive, relying on a demand-driven system since the mid-2000s (Knijn & Saraceno, 2010; Yerkes, 2014). Parents across all socio-economic positions rely heavily on childcare benefits to afford the expense of childcare (OECD, 2020). To be eligible for these benefits, parents with at least one child aged 12 or younger living in the Netherlands must be currently employed (both parents if coupled), unemployed for less than three months, or in education or a reintegration trajectory (Belastingdienst, n.d.). In theory, all parents who meet these criteria formally have access to childcare benefits. To access the benefit, parents must complete an online form with the Dutch Tax Authority, providing essential information about their childcare provider (e.g., the hourly childcare rate), and information about their employment and income, as well as their partner's employment and income where relevant (Akgunduz & Plantenga, 2014; Roeters & Bucx, 2018). Childcare benefits are income-dependent and intended to cover at least one-third of childcare costs. Given the sliding income scale, parents in the lowest income category can be reimbursed for up to 96% of childcare costs (Rijksoverheid, 2021). Parents eligible for benefits pay childcare costs up front in full, then receive a partial, *temporary* reimbursement (i.e., the benefit) from the Dutch Tax Authority in the form of monthly or annual payments. All payments made to parents are then audited by the Tax Authority within one to three years following the tax year in which the childcare benefit was received. At that point, the amount of the benefit will be corrected if necessary and finalised. If parents received too much benefit, they must pay back any amount owed. This retroactive audit procedure is considered to be complicated and demanding for parents (Roeters & Bucx, 2018), based on a complex and untransparent system (Van Dam et al., 2020).

This complex, digitalised system of childcare benefits in the Netherlands became the centre of a government crisis when evidence initially emerged in 2017 that the Dutch Tax Office falsely accused hundreds of parents of fraudulently receiving childcare benefits (Donner et al., 2019). Further investigation showed that in

actuality, thousands of parents had been unfairly required to pay back (tens of thousands of euros (Van Dam *et al.*, 2020)). This disproportionately affected low-income families, who were required to pay back higher sums of money given their eligibility for higher benefit compensations. Moreover, parents accused of fraud were also denied access to childcare benefits while awaiting pending decisions or appeals to these decisions. The actions of the Tax Authority had severe socioeconomic consequences for many parents, including far-reaching debt, job loss and eviction, as well as reduced physical health and mental wellbeing (Donner *et al.*, 2019). The damning report from the in-depth parliamentary inquiry into the crisis was unequivocal: a complicated, market-based system of cash transfers to parents, sensitive to minor changes in parents' employment situation and income led to 'unprecedented injustice' (Van Dam *et al.*, 2020) in the Dutch welfare state.

The parliamentary report, presented mid-December 2020 (Van Dam *et al.*, 2020) had one glaring omission: reference to the online application procedure for childcare benefits. At its core, the Dutch childcare benefit crisis reflects a deeply rooted assumption that parents are equally able to shoulder responsibility for an accurate application procedure in a complex *digitalised* childcare benefit system. This individual responsibility is underscored in the parliamentary inquiry report. Following the introduction of a market-based system of benefits, the person requesting the benefit is responsible for the accuracy of the application (Van Dam *et al.*, 2020). In the Netherlands, with its complex application procedure for childcare benefits, and widespread digitalisation of government services<sup>1</sup> but an unequal distribution of digital skills (Baay *et al.*, 2015), the potential for inequality is great. As such, inaccessible childcare benefits could exacerbate gender and class inequality, which childcare benefits were precisely designed to reduce (Roeters & Bucx, 2018).

### Functional and digital literacy and perceived access to childcare benefits

To study variation in parents' perceived access to childcare benefits, we focus on two key aspects: functional literacy and digital literacy. Functional literacy refers to people's broader ability to navigate the social policy system (Yerkes *et al.*, 2019), and differs in crucial respects from what most people understand literacy to be, namely one's ability to read and write. This 'regular' form of literacy can be seen as a prerequisite for functional literacy. Initially, functional literacy was defined in the same terms as regular literacy (Jones, 1988, as cited in Elley, 2001). Current conceptualisations recognise that functional literacy increasingly relates to societal participation (Elley, 2001), and thus more broadly encompasses the various competencies individuals need in order to function appropriately in society (Gutstein, 2012). Someone who is functionally literate has the skills, knowledge, and capacities to be familiar with the system and knows how to navigate it (Keizer, Tiemeijer, & Bovens, 2019).

Empirical data on functional literacy are not available. However, literacy statistics suggest 2.5 million people in the Netherlands have low regular literacy skills (Israël, Kingma, Zielman, & van As, 2016). This population struggles with tasks such as reading government information and completing forms, indicating lower functional

literacy as well, as lacking these regular literacy skills means these individuals do not possess the competencies necessary to function in Dutch society. In addition, knowledge of the childcare system in the Netherlands (including childcare benefits and eligibility for such benefits) also varies (Boot et al., 2019; Shlay, Weinraub, Harmon, & Tran, 2004). Amongst parents not using formal childcare, 38% does not know what childcare benefits are, 9% has never heard of childcare benefits, and a large group of parents not using formal childcare wrongly believe they are ineligible for childcare benefits (Boot et al., 2019).

Alongside functional literacy, digital literacy (i.e., the ability to use digital tools to create meaning and communicate with others (Neumann, Finger, & Neumann, 2017)) is equally necessary to apply for childcare benefits in the Netherlands, and increasingly for many welfare state benefits throughout Europe (Androniceanu et al., 2019). Two types of digital literacy skills can be distinguished: operational skills, and informational skills (Baay et al., 2015). Operational digital skills include being able to operate a computer, such as typing, whereas informational digital skills refer to the ability to solve everyday problems using a computer, for example, gathering information online. More than half (56%) of 12–74-year-olds has low informational digital skills in the Netherlands, and 10% also has very low operational digital skills. Low digital literacy is most prevalent among the elderly and adults with low regular literacy skills. However, low digital literacy skills are not a problem exclusive to older people: more than 35% of 16–24-year-olds possesses low or insufficient digital literacy skills in the Netherlands (Baay et al., 2015). As such, we must reject the idea of ‘digital natives’, which presumes young people grow up using information technology, instead of acquiring these skills at a later age (ICDL Foundation, 2018).

We treat digital and functional literacy analytically as two separate concepts, yet in practice, these two concepts are closely related. Both digital and functional literacy are not ubiquitous, which can affect the accessibility of online services, such as childcare benefits. Dutch parents are expected to be able to complete the online childcare benefit application self-sufficiently, yet many parents have difficulties doing so (Keizer et al., 2019; Roeters & Bucx, 2018), potentially given insufficient functional and digital literacy. The application procedure demands various competencies requiring digital and functional literacy that parents can struggle with: they need reading skills to understand the website, the digital skills required to log on to an online government system using a web-based security system (DigiD) and to navigate the online policy process, as well as the functional literacy skills necessary to estimate their annual income and organise all the information required to complete the application. In this article, we investigate how, and to what extent, digital and functional literacy affect Dutch parents’ perceived access to childcare benefits. As childcare use is stratified by socio-economic position (e.g., Boot et al., 2019; Pavolini & Van Lancker, 2018), we investigate the extent to which the relationship between education and perceived access is due to differences in digital and functional literacy across varying educational levels. We recognise the limitations of using educational level as a proxy of socio-economic position (e.g., that low literacy is not equivocal to low education Israël et al., 2016) and that indicators of social class may provide different outcomes (Pavolini & Van Lancker, 2018). But existing research suggests that educational level is an important correlate

with lower perceived access to childcare benefits in the Netherlands (Boot *et al.*, 2019). We discuss potential alternatives below.

### Perceived access from a capability perspective

We analyse how digital and functional literacy affect perceived parental access to childcare benefits using the capability approach (hereafter ‘CA’). Childcare capabilities represent ‘parents’ capabilities to organise childcare in a way that enables them to pursue those activities in life they have reason to value’ (Yerkes & Javornik, 2019, p. 530). The CA is a philosophical and normative framework focused on human wellbeing and people’s opportunities to live a valued life (Nussbaum, 2011; Robeyns, 2017; Sen, 1992, 1999). From a CA perspective, social inequalities arise because individual opportunities are embedded in people’s personal situations and broader social structures. Therefore, individual freedoms may be limited by individual, community, environmental, and/or societal constraints (Hobson, 2014; Robeyns, 2005; Yerkes, Hoogenboom, & Javornik, 2020).

In Sen’s terms, individual wellbeing and social justice depend on equality – defined as the extent to which everyone has basic capability equality (Robeyns, 2005; Sen, 1980). In other words, the idea that every individual has equal capabilities to attain certain basic or essential functionings in life (Arneson, 2006; Sen, 1980). Capabilities are one’s real freedom to act (Sen, 1992); in this context, parents’ real opportunities to organise childcare in a way they value. Several factors can limit childcare capabilities, such as the opening hours of formal childcare services, waiting lists (Roeters & Bucx, 2018), and the accessibility of childcare benefits (Yerkes & Javornik, 2019). We extend this emerging literature by suggesting that variation in digital and functional literacy may limit parents’ capabilities to organise childcare in a valued way.

A recent application of a capability approach to childcare policy (Yerkes & Javornik, 2019) analysed childcare services as a *means* (i.e., resource) for parents’ childcare capabilities. In CA terms, *means* refer to material or financial resources such as those provided by welfare state arrangements (Yerkes *et al.*, 2019) but can also include immaterial or immeasurable resources (Robeyns, 2017). We focus here on parents’ *perceived* access to childcare, thereby providing crucial insights into *agency* inequalities. In other words, in theory, childcare services and benefits to help cover childcare costs are offered to all working parents in the Netherlands as a resource (i.e., *means*) to participate in paid work. Indeed, most parents have access to income-dependent childcare benefits, theoretically providing relatively equal access across income groups. In reality, parents’ perceptions of childcare services and benefits may limit their agency in accessing these resources. Consequently, parents do not experience the same freedom to be agentic, which limits their ‘perceived scope of alternatives’ (Hobson, 2018), ultimately forming a limitation of their capabilities (Robeyns, 2017).

Multiple factors (*conversion factors* in CA terms) shape the extent to which individuals are able to convert means into capabilities (Sen, 1992), as individuals are embedded in intersecting personal, community, and institutional contexts. We focus here on the personal level factors of digital and functional literacy as two factors that may shape parents’ perceived access to childcare benefits within the

given institutional setting of the Dutch welfare state, thereby limiting their childcare capabilities. We consider these two factors in relation to educational level. The literacy research outlined above suggests low 'regular' literacy and digital literacy often coincide with other social determinants, in particular lower education levels (Baay et al., 2015; Houtkoop, Allen, Buisman, Fouarge, & van der Velden, 2012). Moreover, as previously noted, the childcare literature suggests socio-economic position, in part driven by educational levels, is an important determinant of childcare access (Boot et al., 2019; Pavolini & Van Lancker, 2018; Roeters & Bucx, 2018; Van Lancker & Ghysels, 2016). Potentially, these educational differences in childcare access are related to variation in functional and digital literacy (i.e., that functional and digital literacy mediate the relationship between education and perceived access). Research suggests, for example, that parents from lower socio-economic positions may insufficiently understand childcare allocation systems (Abrassart & Bonoli, 2015). Taken together, and using educational level as a proxy for socio-economic position, we therefore expect that tertiary educated parents experience greater perceived access to childcare benefits than parents with less than tertiary education (H1); that tertiary educated parents possess higher levels of digital (H2) and functional (H3) literacy skills than non-tertiary educated parents; and that parents with higher levels of digital literacy (H4) and functional literacy (H5) will have greater perceived access to childcare benefits than parents with lower digital and functional literacy. Finally, given the potential relationship between educational level and functional and digital literacy, we investigate whether the relationship between educational level and perceived access is (partially) mediated by differences in parents' digital and functional literacy (H6).

## Methods

### *Participant recruitment*

A quantitative survey was developed to gather data on functional and digital literacy, parents' perceived access to childcare benefits, and several sociodemographic characteristics. We relied on a convenience sample (Etikan, 2016) of parents who were eligible for childcare benefits at the time of the survey (as described in the section 'Childcare services in the Netherlands'). Fielding of the survey took place between April and July 2020 at the height of the COVID-19 pandemic and the first lockdown. This meant all public spaces, including childcare facilities, were closed as a lockdown measure between early March and early June of 2020. The pandemic directly affected data collection. The survey was intended to be administered both online and in paper form (via local organisations willing to assist in targeting low literacy groups), thereby ensuring parents with lower functional and/or digital literacy skills could access the questionnaire (de Leeuw, 2018). Ultimately, participant recruitment was limited to predominantly online surveys. Online survey distribution took place through social media (Facebook, Twitter, LinkedIn), social networks of the researchers, and snowball sampling. In addition, as COVID-19 measures were lifted in May and June, a limited number of paper surveys (110) were distributed via formal childcare organisations in Amsterdam and Utrecht. Response based on the printed surveys was very low: 1.8%. The low response rate reflects the

well-known difficulty of reaching lower-educated respondents (Blasius & Brandt, 2010), which was further complicated by COVID-19 restrictions in place at the time of data collection that prevented the researchers from having any direct contact with parents. We reflect on these limitations in the discussion. This study received ethical approval from the Faculty of Social and Behavioural Sciences (Utrecht University) required for research with human participants. All participants were provided detailed information about the study and their participation and gave full informed consent before completing the survey.

### Measures

**Perceived access to childcare benefits** was measured through the statement ‘I think applying for childcare benefits is complicated’. Answer categories were on a 7-point Likert-scale with responses ranging from ‘completely agree’ to ‘completely disagree’ (cf., Roeters & Buxc, 2018), whereby a higher value corresponded to higher perceived access. Subsequently, all participants were asked which factors – if any – complicated the application procedure (e.g., the income estimation).

**Socio-economic position** was measured using educational level and income (Connelly, Gayle, & Playford, 2021). Educational level was measured by an existing 7-point scale that contains all levels of the Dutch education system (SCP, 2017). This scale was recoded into higher education (tertiary education) and lower-intermediate education (less than tertiary education), given the underrepresentation of lower educated individuals in our sample. Income, defined as the total household income, was categorised into lower than €3500/month (reference category), and higher than €3500 a month.

**Functional literacy**, that is, people’s ability to navigate the social policy system, was assessed by a measure developed through desk research and two qualitative cognitive pre-testing interviews. We interviewed one parent and one advisor of social legal services, and used the ‘thinking-aloud-probe’ to step-wise identify the underlying competencies necessary to apply for childcare benefits (Gutstein, 2012; Lenzner, Neuert, & Otto, 2016). The following competencies emerged as essential for applying for childcare benefits: working meticulously, anticipating and maintaining changes in one’s personal and financial situation, possessing organisational skills, and the ability to read and write (‘regular’ literacy). We translated the required competencies into eight statements, for instance: ‘I always open and read my mail the same day I receive it’, measured on 10-point Likert-scales with answer categories ranging from 1 (completely agree) to 10 (completely disagree). Literacy (the ability to read and write) also emerged as an essential component of functional literacy. The survey therefore included the DIS-scale,<sup>2</sup> a series of statements developed by the Dutch Foundation for Reading and Writing (de Greef *et al.*, 2015) to assess respondents’ ability to read and write. These statements were also measured on 10-point Likert-scales with answer categories ranging from 1 (completely agree) to 10 (completely disagree).

For the analyses, we used two DIS-statements with sufficient variation in the responses: one statement concerning respondents’ difficulty completing forms related to employment and welfare state benefits, and one concerning difficulty reading and comprehending government information. We combined the eight



functional literacy statements and the two DIS-scale literacy statements into one combined measure. PCA and reliability analyses were conducted to assess the underlying structure and reliability of this combined measure. Although the PCA distinguished two separate constructs, in line with one construct for functional literacy and one for 'regular' literacy, the reliability of the combined measure was high (Cronbach's alpha 0.896; Field, 2013). We therefore used the combined measure, with higher scores indicating higher levels of functional literacy.

**Digital literacy** was measured using the digital competence framework (Carretero, Vuorikari, & Punie, 2017), designed to measure people's ability to critically and responsibly use and engage with digital technology for education, employment, and societal participation. As the original framework is in English, two authors separately translated the framework to Dutch and discussed the translation to generate inter-translator reliability. The original measure included 21 items, differentiating between digitally literate versus illiterate (Carretero et al., 2017). To increase the perceived relevance of the scale for this study's purposes, and to reduce the survey's length, factors that both affect the probability of survey completion (Galesic, 2006), five items measuring software skills for content manipulation were excluded. Our final measure therefore contained sixteen statements tapping into social, informational, and problem-solving digital skills. We further deviated from the original measure by measuring digital literacy as a continuum (scores ranging from 0 to 16) as opposed to a threshold, in line with the increasing debate on rejecting threshold-scores for literacy (OECD, 2000).

**Controls** included age, gender, ethnicity (Abrassart & Bonoli, 2015), and income instability (given the income-dependent nature of the childcare benefit; den Dulk & Yerkes, 2016). Age was measured continuously in years, and gender as female (reference category) or male. Ethnicity was defined as country of birth, distinguishing between those born in the Netherlands (reference category) and those born elsewhere. We measured income instability in relation to employment status and contract type. We categorised dependent employees with a permanent contract (reference category) as more likely to have stable incomes, whereas other workers (including dependent employees with a temporary contract, the self-employed, the temporarily unemployed, and those in an education or reintegration trajectory) were categorised as having potential income instability.

### Analytical strategy

Missing values on the literacy measures were calculated using trend imputation measures. Our analyses proceeded as follows. First, univariate t-tests were used to test differences between non-tertiary and tertiary educated participants in perceived access, digital literacy, and functional literacy. In a second step, OLS regression was used for the main models (hypotheses 1 through 5); all were adjusted for gender, age, ethnicity, and income instability. Subsequently, a parallel mediation model (Baron & Kenny, 1986) would have been conducted in SPSS using Process Model 4, allowing for parallel mediation analyses with covariates (Field, 2013). However, given the absence of support for mediation (see Results), this analysis was not conducted. In a fourth and final step, we conducted several sensitivity analyses. These included using income instead of educational level to account for differing

measures of socio-economic position (Mudd, Verra, Bal, & Kamphuis, 2022) as well as using an alternative dependent variable, namely parents' understanding of the childcare benefit system rather than perceived access to childcare benefits. This knowledge was measured through the statement 'I understand the system of childcare benefits', answered on a 10-point Likert-scale, ranging from completely disagree to completely agree (models presented in the Supplemental Materials).

### Sample characteristics

In total, 177 respondents took the survey, and the final analytical sample was 137. A total of thirty-nine respondents were excluded for not fully completing the survey, and one respondent was excluded as they likely did not meet our study inclusion criteria based on their age (73 years old). The majority (81.8%;  $n = 112$ ) of our sample was female. Respondents' ages ranged from 23 to 55; 36.4 years old was the average age ( $SD = 5.8$ ). In total, only 2.2% ( $n = 3$ ) of the sample was lower educated, 18.4% ( $n = 25$ ) had an intermediate educational level, and 79.4% ( $n = 108$ ) was higher educated. Most respondents (118; 86.8%) were born in the Netherlands, and eighteen (13.2%) were born abroad. Many parents (92; 67.6%) were in paid employment with a permanent contract, and forty-four (32.4%) had some form of flexible employment (a fixed-term contract, self-employment, or an education or reintegration trajectory), or were temporarily unemployed. Due to the overrepresentation of higher-educated parents, descriptive statistics were weighted to the educational levels in the Dutch population (SCP, 2018).

### Results

Within our sample, 112 parents used formal childcare at time of data collection: sixteen (11.8%) had previously used formal childcare services, and eight (5.9%) had never used them. Reasons for not/no longer using formal childcare varied. Three (2.2%) parents reported this was due to their (partner's) employment situation, twelve (8.8) due to their children not needing childcare anymore, and four (2.9%) due to uncertainty of the benefits system. A total of 108 respondents in our sample were receiving childcare benefits at the time of data collection, 15 (11.0%) had previously received benefits, and 13 (9.6%) had never received childcare benefits. When these parents were asked why they did not/no longer receive childcare benefits, three (2.2%) parents reported not knowing about childcare benefits; 3 (2.2%) reported their income was too high to receive these benefits, two (1.5%) were reluctant to receive childcare benefits given the childcare benefits scandal, one (0.7%) found the application procedure too complicated; and twenty-one parents reported 'another reason', which included a wide variety of responses, such as not being eligible, and not understanding the childcare benefit system. Although some respondents wrote about issues unrelated to digitalisation, for example not wanting to do administrative tasks or having to continuously update information on their personal situation, many of these twenty-one parents wrote about problems related to the digital application procedure. Primarily, such responses centred on the application system being difficult to understand, or insufficiently capturing the reality of parents' lives, such as 'non-standard' situations or various types of flexible work.

This perceived complexity of the application procedure is reflected in our descriptive data. Nearly two-fifths (38%) of parents in our sample reported feeling that the childcare benefits application procedure was complicated. Reasons for why they felt it was complicated varied. The majority of parents ( $n = 84$ , 61.8%) reported the complication was related to having to estimate their income, and twenty-seven parents (19.9%) said the news about the supposed fraud with childcare benefits scared them. According to our respondents, the amount of information needed ( $n = 67$ , 49.3%), being afraid of making mistakes ( $n = 47$ , 34.6%), the different terms being used ( $n = 42$ , 30.9%), the amount of work required to complete the application ( $n = 35$ , 25.7%), the fact that the application procedure is online ( $n = 35$ , 25.7%), and that the procedure is in the Dutch language ( $n = 26$ , 19.1%) also made the application procedure complicated. Responses of 'Other' reasons respondents felt it was complicated once again included factors often related to the rigidity of the system that insufficiently accounts for changes in people's lives, such as flexible employment, changes in income and employment, and changes in family situations (more children, divorce). Despite the perceived complexity of the childcare benefits application procedure, our descriptive results (see Table 1) suggest both functional and digital literacy were high in our sample. The mean functional literacy score was 7.8 (SD 1.86, range 2.08–10), and the mean digital literacy score was 13.6 (SD 2.64, range 3–16).

Higher ( $M = 4.25$ ,  $SD = 1.74$ ) and lower-intermediate ( $M = 5.14$ ,  $SD = 1.92$ ) educated parents differed significantly on their perceived access to childcare benefits ( $t(134) = 2,356$ ,  $p = 0.020$ ; see Supplementary Table 1), suggesting higher-educated parents in our sample had lower perceived access to childcare benefits, contradicting our first hypothesis. Exploratory analyses undertaken to explain this unexpected relationship show that higher-educated parents were less likely to receive help during this application procedure than lower-intermediate educated parents (chi-square (1,  $N = 136$ ) = 16,891,  $p < 0.001$ ). However, controlling for receiving help with the application procedure did not nullify this negative relationship between educational level and perceived access.

Multivariate linear regression analyses confirmed the negative association between educational level and perceived access, thereby rejecting H1 (see Table 2, model MI, and Figure 1). Next, we found that educational level was neither significantly associated with digital literacy (M2, note this association neared significance), nor with functional literacy (M3), leading us to reject H2 and H3. Digital literacy (M4) and functional literacy (M5) were also not associated with perceived access, leading us to reject H4 and H5. As we did not confirm our hypotheses, no mediation effect could be established.

### Sensitivity analyses

Two sensitivity analyses were conducted (see Methods, above). The analyses using income instead of educational level did not change our results, as income was not associated with perceived access, digital literacy, or functional literacy (see Supplemental Material). Although our final sensitivity analysis revealed statistically significant associations between digital and functional literacy and parents'

**Table 1.** Descriptive statistics, weighted

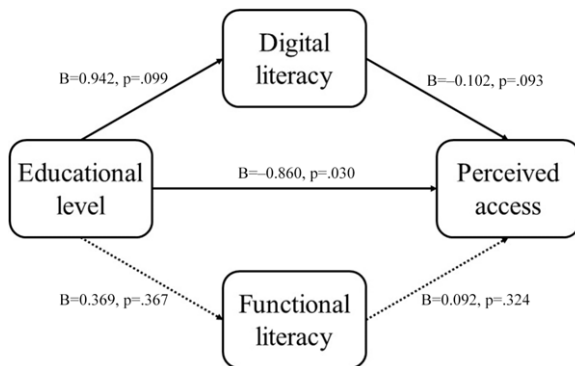
	n (unweighted)	Mean (SD)/% (unweighted)	Min (weighted)	Max (weighted)	Mean (SD)/% (weighted)
Perceived access	134	4.4 (1.80)	1	7	4.7 (1.81)
Total digital literacy	136	13.6 (2.64)	3	16	13.0 (3.17)
Functional literacy	130	7.8 (1.86)	2.8	10	7.6 (1.91)
Age	136	36.4 (5.76)	23	55	35.6 [5.64]
Sex – N [%]	137				
Female	112	81.8			80.0
Male	24	17.5			20.0
Other	1	0.7			
Ethnicity – N [%]	136				
Dutch	118	86.8			85.8
Abroad	18	13.2			14.2
Educational level – N [%]	136				
Low	3	2.2			12.7
Intermediate	25	18.4			36.0
High	108	79.4			51.3
Contract type – N [%]	136				
Permanent	92	67.6			64.8
Other than permanent	44	32.4			35.2
Income – N [%]	136				
Less than €1500 per month	5	3.7			4.3
€1500–2500 per month	13	9.6			14.8
€2500–3500 per month	19	14.0			14.8
>3500	89	65.4			59.4
Don't know/don't want to say	10	7.4			6.7

understanding of the childcare benefits system, no mediation analysis was conducted, as educational level was not associated with parents' understanding of the childcare benefit system. Further exploring these analyses, however, we note that amongst our control variables, age was associated with functional literacy, and the association between country of birth and ethnicity neared significance. Moreover, functional and digital literacy were associated with parents' understanding of the childcare benefit system, and the associations between both age and ethnicity and parent's understanding of the childcare benefit system neared

**Table 2.** Main model results

Dependent variable	M1	M2	M3	M4	M5
	Perceived access Unstandardized B (SE)	Digital literacy Unstandardized B (SE)	Functional literacy Unstandardized B (SE)	Perceived access Unstandardized B (SE)	Perceived access Unstandardized B (SE)
Educational level (low-intermediate = ref.)	<b>-0.860 (0.391)*</b>	0.942 (0.567)	0.369 (0.407)	-	-
Digital literacy (linear)	-	<i>Dependent variable</i>	-	-0.102 (0.060)	-
Functional literacy (linear)	-	-	<i>Dependent variable</i>	-	0.092 (0.092)
Sex (male = ref.)	-0.218 (0.416)	-0.028 (0.593)	-0.369 (0.448)	-0.310 (0.417)	-0.287 (0.447)
Age (linear)	-0.009 (0.029)	-0.057 (0.042)	<b>-0.076 (0.031)*</b>	-0.030 (0.029)	-0.023 (0.031)
Country of birth (the Netherlands = ref.)	0.735 (0.525)	-1.547 (0.720)	-0.002 (0.510)	0.644 (0.536)	0.800 (0.541)
Income stability (Permanent contract = ref.)	-0.510 (0.350)	0.276 (0.503)	-0.502 (0.359)	-0.485 (0.353)	-0.410 (0.366)
Constant	5.932 (1.430)	15.142 (2.073)***	11.130 (1.540)***	7.567 (1.704)***	5.062 (1.863)**
R <sup>2</sup>	0.064	0.074	0.069	0.050	0.036
Df	133	135	129	133	127

\* = p < 0.05, \*\* = p < 0.01, \*\*\* = p < 0.001.



**Figure 1.** Model studying the mediating effects of digital literacy and functional literacy on the relationship between educational level and perceived access to childcare benefits.

significance. Specifically, older parents seemed to have lower functional literacy, and a lower understanding of the childcare benefits system. An exploratory mediation analysis indeed suggests that functional literacy significantly mediates the association between age and parents' understanding of the childcare benefit system.

## Discussion

Dutch childcare policy has been in crisis in recent years. Parents continue to face the social, economic, and health consequences of being unjustly accused of fraudulently accessing childcare benefits to cover the costs of relatively expensive, market-based childcare. This crisis occurred at a time when parents, and citizens more broadly, face risk of exclusion (Selwyn, 2002) through increased expectations of being 'digital citizens' requiring them to access social policies, like childcare benefits, through online procedures (Lolich & Timonen, 2022). Against this backdrop, our study investigated parents' perceived ability to access childcare benefits in relation to functional and digital literacy as a potential barrier to parents' childcare capabilities.

Our descriptive results suggest that a considerable group of parents considers childcare benefits to be difficult to access given the complexity of the system. The necessity of estimating one's income (and that of the partner) was seen to be the most onerous task. Second, despite the fact that most parents were tertiary educated, we still found some variation in parents' functional and digital literacy skills, demonstrating that functional and digital literacy skills are not ubiquitous, even among higher educated parents. Further, no mediation between educational level, digital and functional literacy, and perceived access could be established. The absence of significant results, and the unexpected negative association between education and perceived access to childcare benefits, may be due to the small sample size and the underrepresentation of lower-educated parents.

The absence of a significant relationship between digital literacy and perceived access deserves more attention in future research. Discussions with social work organisations during the development of the survey confirmed that a lack of digital literacy is an issue for parents when accessing childcare benefits in the Netherlands

but greater variation in the sample is needed to investigate this relationship. Additionally, open survey answers suggest parents experience difficulties with the online system that current conceptualisations of digital literacy may not capture. These answers suggest the digital skills needed to complete and maintain applications for benefits such as childcare benefits in the Netherlands require more than operational and informational skills (Baay et al., 2015). The results of our study should be interpreted as exploratory and not representative and warrant future research using representative samples of parents, including sufficient parents with lower levels of education and digital literacy, to research this understudied topic. We recognise, however, that reaching respondents with low digital literacy remains challenging as digital and social exclusion often go hand in hand (Helsper, 2012; Selwyn, 2002).

Neither functional nor digital literacy were associated with educational level. The former finding may indicate that the concept of functional literacy may reflect the skills needed to navigate the system as well as personality traits and psychosocial factors, such as coping styles. For example, research published after our study on a representative group of Dutch citizens suggests individuals differ in their '*doenvermogen*', that is, their '*capacity to act*' (Keizer et al., 2019). Several factors constituting this capacity to act might also be relevant for functional literacy, such as stress, self-efficacy (one's belief in oneself), and having an approach- or avoidance-temperament (acknowledging and tackling problems versus ignoring problems; Elliot & Thrash, 2010; Haushofer & Fehr, 2014; WRR, 2017). Interdisciplinary research could help to incorporate these psychosocial factors in relation to how people access social policies.

Our exploratory findings offer additional avenues for further research. For example, income instability was not associated with perceived access, possibly due to the small sample size and the low representation of parents in flexible employment. Yet 61% of all parents in our sample agreed that the income estimation complicates the application procedure for childcare benefits. More than thirty parents attributed errors made in the application procedure to changes in income, for example due to flexible working or self-employment. In a market-led system of childcare benefits, income instability results in parents receiving either too much or too little childcare benefit. Given the potential significant consequences of having to retroactively correct the amount of benefit received, this relationship demands more attention in future research, particularly in relation to digitalisation.

The sensitivity analyses further indicated more research is needed on the relationship between parents' understanding of the childcare system and perceived access. Functional literacy was found to mediate the association between age and parents' understanding of the childcare benefits system: older individuals appear to possess lower functional literacy, resulting in a lower understanding of the system. Perceived access to childcare benefits, measured here as the perceived difficulty in completing the benefit application procedure, is arguably not the same as parents' understanding of the childcare benefits system, as the latter may reflect their program specific knowledge (Seibel, 2021). Without knowing which benefits are there and how to access them, perceived access likely does not matter because using childcare services would not fall within parents' '*perceived scope of alternatives*' (Hobson, 2018). In other words, agency inequalities result from an absence of

functional literacy, resulting in lower program specific knowledge and thus lower perceived access to childcare. Our sensitivity analyses suggested that these agency inequalities are intertwined with parents' age and ethnic minority status. Future research into the implications of these differences, particularly for parents with an ethnic minority background, is needed given their overrepresentation in precarious social and economic positions.

We note some limitations to our study. Various measures were taken to secure a diverse sample, but social distancing and the closing of many public spaces due to the COVID-19 pandemic made reaching a diverse sample (particularly respondents with low digital literacy skills) even more difficult. Higher educated respondents were overrepresented, while other groups (in particular, lower educated parents, and parents with income insecurity) were underrepresented. The underrepresentation of these groups likely affected various measures used here, including the scores for functional and digital literacy (Baay *et al.*, 2015; Houtkoop *et al.*, 2012; Van Deursen & Van Dijk, 2008). Even within our rather homogenous sample, however, we find variation in functional and digital literacy and perceived access to childcare benefits, suggesting that access to childcare varies, even among higher-educated parents. Nevertheless, limitations concerning the sample's generalisability remain. We are therefore limited to drawing conclusions only about our convenience sample; future research using a representative sample is needed. Finally, some parents in our sample never received childcare benefits: if these parents never attempted to apply for childcare benefits, their perceived difficulty of the application procedure may thus be based on, for instance, other people's experiences. Further research comparing these two groups (e.g., in line with Roeters & Bucx, 2018) would be useful in this regard.

Despite the small sample size and low heterogeneity, our results provide important initial insights into the accessibility of childcare in relation to digitalisation and *perceived* access. In countries with relatively expensive, market-based childcare services (Yerkes & Javornik, 2019), decreased perceived access can have an even greater impact on parents with lower socio-economic positions, maintaining or exacerbating Matthew effects (Pavolini & Van Lancker, 2018). Perceived difficulty in applying for childcare benefits also limits parents' childcare capabilities, which can negatively affect parents' (predominantly mothers') labour market participation and career prospects, and their children's educational development, further reinforcing existing inequalities in class and gender (Abrassart & Bonoli, 2015; Léon, 2017; Pavolini & Van Lancker, 2018; Saraceno, 2017; Shlay *et al.*, 2004). The measure for functional literacy, developed using desk research and qualitative cognitive pre-testing, PCA and reliability analyses, is reliable and internally consistent. While focused on childcare benefits, minor adaptations to this measure could broaden its applicability for assessing functional literacy in other policy contexts as well, which is crucial in societies in which individuals are increasingly expected to function self-sufficiently in complex policy environments (Keizer *et al.*, 2019).

Our findings also have potential theoretical implications for understanding parents' childcare capabilities, that is, parents' opportunities to organise the care of children and other life pursuits (including but not limited to paid work) in a valued way. From this perspective, functional literacy limits parents' capabilities by



constraining their access to resources (in the form of childcare benefits). Taking a capability approach helps to reveal agency inequalities evident in accessing these resources. As society is increasingly organised around digital infrastructures (Helsper, 2012), attention for factors that impede or enhance access to resources (*conversion factors*), thus shaping agency inequalities, becomes increasingly relevant for capabilities and wellbeing. The wider contextual perspective offered by the capability approach is of importance here, as the Netherlands, and several other countries in north-western Europe, are further ahead in digitalisation than, for instance, many Central and Eastern European countries (Androniceanu et al., 2019). The importance of functional and digital literacy for parents' capabilities will likely differ depending upon digitalisation developments and the extent to which individuals are expected to be self-sufficient in organising various aspects of their lives. The coexistence of social and digital exclusion can have a cumulative effect, worsening social exclusion (Selwyn, 2002). Indeed, Selwyn (2002) already warned against the perverse effects of digitally provided social policies that increase social exclusion rather than social inclusion more than 20 years ago. As digital and functional literacy are becoming increasingly important for societal participation (Androniceanu et al., 2019), the accessibility of childcare for parents with lower digital and functional literacy should be safeguarded to avoid exacerbating existing inequalities (Bonacin, Melo, Simoni, & Baranauskas, 2010).

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## Notes

1 Digitalisation is widespread in the Netherlands, with government services at both the national and local levels almost unequivocally provided online. In addition, internet access is widespread, even in rural areas, and globally, has one of the highest densities of digital devices (CBS, 2020). This digital context allows for a focus on variation in digital skills for accessing social policies and the potential effects on inequality.

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