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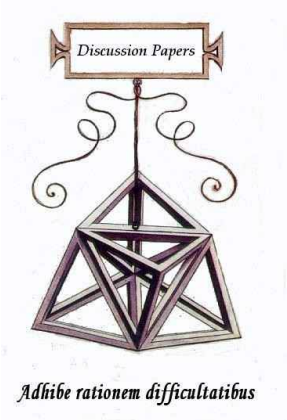

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Discussion Paper
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Disability and happiness: the role of accessibility

Abstract

There exists a significant differential in life satisfaction between disabled and nondisabled people, to the disadvantage of the former. The present work considers both satisfaction and meaning of life (as different facets of happiness),investigating whether environmental accessibility mediates the relationship between disability and happiness. Furthermore, the effect of accessibility on the happiness of different categories of disabled is analysed. The environmental accessibility index is built using data from the 2012 Eurobameter survey on accessibility, while the rest of the variables come from the EU-SILC 2013, which includes an ad hoc module on well-being. Findings show that higher environmental accessibility narrows the happiness gap between disabled people and the rest, even after interaction terms between disability and economic status are introduced. Moreover, environmental accessibility has a greater impact on the happiness of older disabled people, while the opposite is true of disabled people in the highest income quartile.

Keywords: Disability, Happiness, Accessibility

JEL: H41, I14, I31

Introduction

There is a significant differential in happiness between disabled and nondisabled individuals, to the disadvantage of the former (Easterlin, 2006). The present contribution aims to investigate the impact of environmental accessibility on such differential. Furthermore, we will explore the effect of accessibility on the happiness of different categories of disabled people. In particular, we show that this effect varies depending on age and household income.

Although it provides no definition of accessibility *per se*, the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD, henceforth) mandates State Parties to "[...] ensure to persons with disabilities access, on an equal basis with others, to the physical environment, to transportation, to information and communications, including information and communications technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas" (The United Nations, 2006, art. 9). In the present work, transportation, buildings, open public spaces, streets, sidewalks and traffic lights will collectively be referred to as "built environment", since they result from human intervention on the natural environment[1].

I build the environmental accessibility index using data from a survey on accessibility in the European Union, which asked disabled people (Eurobameter, 2012) about their difficulties in accessing the built environment.

Regarding happiness, a distinction is made between Life Satisfaction and Meaning of Life. Although in practice both are self-reported measures, the former, sometimes referred to as subjective well-being, is connected to pleasure-seeking, while the latter is rooted in Aristotle's idea of Good Life and close to the modern concept of "human flourishing" (Bruni, 2010; Kashdan, Biswas-Diener and King, 2008; Heintzelman, 2018; Sen, 1979). In what follows, Life Satisfaction and Meaning of Life will often be referred to as hedonic and eudaimonic well-being, respectively.

The focus here is on environmental accessibility, rather than accessibility tout court, because being in the physical presence of human beings one has something to share with is more beneficial to one's subjective well-being than interacting with them through the use of information and communication technologies (Anand, 2016).

Using Eurobameter 2012 data on accessibility in combination with survey data on well-being, this paper is the first contribution to treat environmental accessibility as a disability policy in its own right and build a cross-national accessibility index.

Moreover, it draws a connection between the accessibility of built environment specifically to disabled people, their happiness and the happiness differential between disabled and non-disabled individuals (to the disadvantage of the former).

Finally, it analyses the effect of personal factors on the relationship between accessibility and the happiness of disabled people.

[1] https://www.sciencedirect.com/topics/engineering/built-environment

Theoretical framework

This sub-section illustrates the author's understanding of disability, environmental accessibility, happiness and the relationships between the three. These concepts are framed using the capability approach together with insights from disability studies scholarship.

Let us start from happiness. The present analyses rest on the assumption that individuals report higher hedonic and eudaimonic well-being if

a) they have the practical opportunities (capabilities) to achieve objectives that they themselves value and/or
b) they achieve valued objectives.

It follows that subjective value systems are very important when it comes to happiness. The capabilities approach does not specify what objectives should be valued, as that concerns the individual (Sen, 1999). However, other strands of literature can offer some insights into what goals people, including disabled persons, may find worth pursuing.

Social inclusion is certainly one of those goals, as evidenced by the fact that social capital is positively associated with subjective well-being (Bartolini, Bilancini and Pugno, 2013, Bartolini, Bilancini and Sarracino, 2013). This type of capital is composed by relational goods and by trust in institutions, where relational goods include honesty, solidarity, social participation, and civic engagement, as well as meeting with friends, family and neighbours.

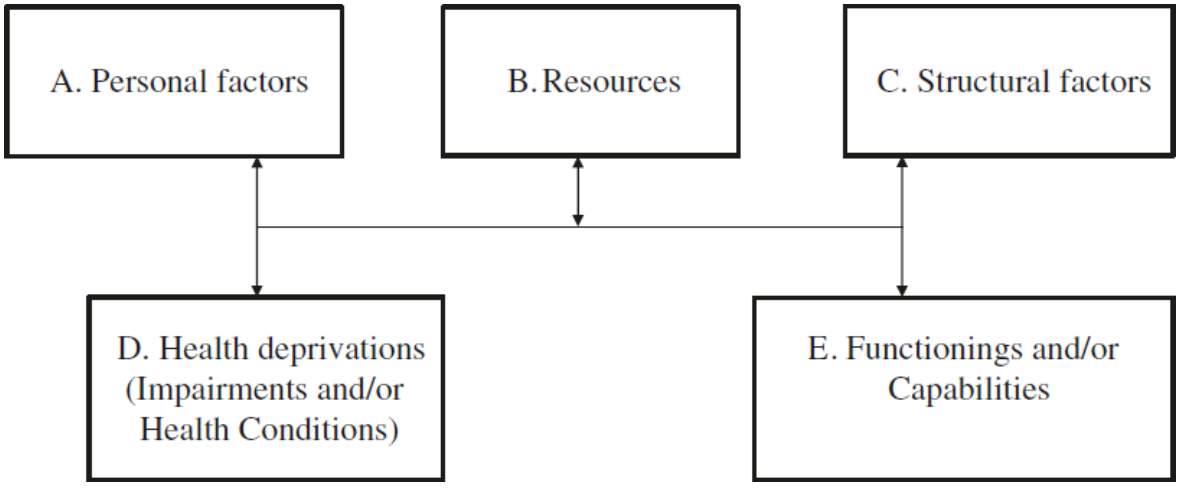
Despite mentioning people with disabilities and/or disabled people, neither happiness scholars, nor the UNCRPD define or articulate disability itself. In order to do so, I adopt the human development model of disability, health and well-being (human development model, henceforth; see Mitra, 2017). This model applies the capability approach to disabled people.

In the human development model, disability arises from the interaction between multiple factors, as illustrated in **Figure 1**. The expression health deprivations (box D) refers to impairments and/or health conditions, which put individuals at risk of disability while not necessarily making them disabled. Type and severity of impairment are characteristics of health deprivations. As mentioned earlier, capabilities represent practical opportunities. Functionings refer instead to achievements. Capabilities and functionings are together in box because, while achieving a valued objective certainly improves one's happiness, expanding one's opportunities might be just as important to their eudaimonic and hedonic well-being. At the top of the chart, personal factors (box A) include race/ethnicity, age, sex and so on. Resources (box B) encompass goods, services and information. In addition to more common goods and services, disabled people might require medications and/or assistive technologies. Furthermore, they may need specialized medical care, sign language interpreters, assistance animals, or personal care assistants in order to be able to live in their communities rather than in institutions (care homes).

As for structural factors (box C), they refer to the environment (broadly defined) in which the individual lives. Roads, buildings, open public spaces and transportation collectively constitute the physical environment, which may be accessible to individuals with different impairments and health conditions or not.

Then, environmental accessibility is capability enhancing because it facilitates impaired and chronically ill people in achieving valued objectives. On the contrary, lack of accessibility is actually disabling. Coupled with health deprivations and possibly other factors, it can determine the shift from being at risk of disability to becoming disabled. In fact, disability is defined here as a deprivation in terms of functionings and/or capabilities among persons with health deprivations.

Figure 1 *The human development model of disability*



Source Mitra (2017, p. 17)

Furthermore, as disability studies scholars maintain, restricted access to the built environment is a form of discrimination. Lack of accessibility is often considered "normal", with accessibility features treated as "special" (Kafer, 2013). However, sidewalks without kerb cuts are no more natural than those with dropped kerbs, and traffic lights which beep or chirp when turning green no more natural than those which do not (Taylor, 2017). In other words, "inaccessible" transportation, roads and buildings are designed so that able-bodied, able-minded, neurotypical individuals can access them, while other people cannot[2].

It follows that environmental accessibility may affect the eudaimonic and hedonic well-being of disabled individuals not only by expanding their capability sets, but for two other reasons as well. Firstly, disabled people could value the opportunity to access physical environment on an equal basis with others for its own sake. Secondly, they might interpret greater environmental accessibility as a signal of reduced discrimination towards disabled people in general.

Finally, it must be acknowledged that environmental accessibility is not the only policy with effects on the social participation and well-being of disabled people, though it is certainly the least researched to date. In fact, economists have been focusing their attention on two specific types of disability policies, namely compensation and integration policies (OECD, 2010), both of which will be discussed in the next sub-section.

[2] Thus, inaccessible transportation and built environments exclude not only disabled persons, but also young children and the elderly.

Compensation and integration policies

The first and, to date, the only classification of welfare systems based on their disability policies comes from the OECD (2010), which scored member States on twenty policy indicators relating to compensation and integration policies. The former refer to various characteristics of disability benefits (e.g. coverage, eligibility, generosity, duration). Sickness benefits and monitoring are also listed as compensation policies. As for integration policies, they encompass vocational rehabilitation services, disabled workers and job applicants' rights and targeted active labour market policies (ALMPs) such as subsidized, sheltered and supported employment. Each indicator receives a score on a 0-5 scale, so that the maximum compensation or integration policy score is 50. An analysis of policy trends up to year 2007 based on this scoring system revealed a gradual shift away from compensation policies and increased emphasis on targeted ALMPs across Europe, with signs of policy convergence.

The position of the authors is clear: tighter and less generous compensation policies should be accompanied by greater investments in active labour market policies and more timely and effective vocational rehabilitation. One of the strategies they suggest for improving the labour market outcomes of disabled people consists in making job-search activities a requirement for benefits eligibility, with frequent reviews of recipients to assess whether their health conditions have changed and to check that they are actively looking for a job. However, tightening disability benefits risks disadvantaging individuals who are unable to obtain employment, as they could find themselves subject to both inappropriate and excessively demanding obligations in terms of employment-seeking efforts, as well as subject to benefit cuts, or reliant on benefits which are subject to frequent reassessment, thereby bringing stress and uncertainty (Waddington, 2016).

Furthermore, when it comes to the empirical analysis, it is difficult to test whether compensation or integration policies should be preferred, because countries with generous welfare systems are also characterized by some of the highest investments in ALMPs (OECD, 2010). In fact, more recent evidence suggests that active and passive policies might be complementary.

Holland et al. (2011) evaluate the effect of both compensation and integration policies by using data from Canada, Denmark, Norway, Sweden and the United Kingdom. As one might expect, higher investments in ALMPs have a positive effect on the employment rate of disabled people. The authors also find that a more flexible labour market does not affect employment rates. Furthermore, the employment rate of disabled people is higher in the Nordic countries, which have a more generous welfare system compared to Canada and the UK. The authors hypothesize that the level of economic and material resources available to individuals outside the labour market due to disability may affect their future ability to reengage in the labour market itself. Van derWel, Dahl and Thielen (2011) obtain similar results after performing multilevel regression analysis on 26 European countries.

Moreover, it must also be taken into account that the OECD (2010) scoring system is based on 2007 data and disability policies have likely changed after the economic crisis, particularly in countries such as Portugal (Tschanz and Staub, 2017). Active and passive disability policies are certainly crucial to the well-being of persons with disabilities, but they need to be regularly monitored and analyzed.

The present work is organized as follows. The second section describes the data and methodology, presenting summary statistics. Results are analysed in the following section, while the fourth section discusses identification and measurement issues. The fifth section reports robustness checks and additional analyses and the seventh concludes.

Data and Methodology

The environmental accessibility index

The Flash Eurobameter 345 on Accessibility (2012) is based on telephone interviews carried out between the 15th and the 17th of March 2012 with nationally representative samples of EU citizens living in private household and aged fifteen or older. Data was collected from the then twenty-seven EU member States. Results were weighted to correct for demographic discrepancies.

Among other things, interviewees were asked whether they and/or someone from their household who had a disability ever experienced difficulties in any of the following:

- Taking a taxi/bus/train/flight
- Entering a building or an open public space
- Using a sidewalk or crossing the street with a traffic light

The possible answers for all three questions were 1. Most of the time, 2. From time to time or 3. Almost never or never. Nearly two in five respondents (38%) reported they and/or disabled household members experienced difficulties in using the sidewalk or crossing the street with a traffic light at least some of the time and the same percentage found it difficult (for themselves and/or family members) to enter a building or an open public space. As for accessing transportation, 36% of the interviewees (i.e. more than a third) experienced difficulties, some or most of the time.

For each of these three questions, as well as each of the countries that participated to the survey, the percentage of respondents that gave each of the possible answers is reported. Following Tschanz and Staub (2017), three types of accessibility can be computed for every country:

$$Acc._j^i = 1 - (w_1 p_{1j}^i + w_2 p_{2j}^i) \quad (1)$$

i =Taxies, buses, trains or flights; Buildings or open public spaces; Sidewalks or traffic lights

j =Austria, Belgium,..., United Kingdom

$w_1 = 0.01$, $w_2 = 0.005$

p = % of responses

The subscripts 1 and 2 refer to answers1. Most of time and 2. Some of the time, respectively, while the letter *w* denotes the weights assigned to each answer. As can be seen, answer (2) is weighted half as much as (1). Since the three types of accessibility are highly correlated, they were not assigned equal weights in the construction of the environmental accessibility index. Rather, the weight assigned to each accessibility dimension was determined using factor analysis. Such a small number of dimensions can be summarized by a single factor, so that a unique score is assigned to each environmental accessibility dimension. Factor-based scores are reported in **Table 2**.

Table 1 Factor-based scores

Accessibility dimension	Factor-based score
Buildings or open public spaces	0.59
Sidewalks or traffic lights	0.26
Taxies, buses trains or flights	0.15
Sum	**1.00**

Thus, the environmental accessibility index of State *j* is determined as

$$Acc._j = \sum FBS^i * Acc.^i{}_j \quad (2)$$

FBS^i=Factor-Based Score of $Acc.^i$

Table 2 reports the values of the environmental accessibility index for each country, as well as the compensation and integration policy scores. The environmental accessibility index is characterised by internal consistency, as Crobach's alpha equals 0.94.

As can be seen, the highest value of the environmental accessibility index is 0.87 (Sweden) and the lowest 0.57 (Cyprus). Then, the phrase *high accessibility* will refer to values of the index greater or equal to 0.81. On the other hand, a country's accessibility will be *low*, if the index is minor than 0.71. Where compensation and integration policies are concerned, scores greater than 30 will be considered high, those minor than 24 low, in an effort to mirror the disability policy classification proposed by OECD (2010). The following EU member States were not scored on their disability policies: Bulgaria, Cyprus, the Baltic states, Malta, Romania and Slovenia (OECD, 2010).

There appears to be some correlation between environmental accessibility and integration policy scores. On the one hand, Belgium, Czech Republic, Greece, Slovakia and Portugal have low accessibility and low policy scores. On the other hand, Denmark and the Netherlands are characterized by both considerable investments in ALMPs and high accessibility. Of all these countries, Portugal is the only one with a high (rather than average) compensation policy score. Theperformance of France and Austria is average in both accessibility and more conventional disability policies. A positive association between integration policies and accessibility can be observed in Finland and Sweden as well. Note that the latter have a generous welfare system too.

However, the relationship between accessibility and integration policies is not always so clear-cut.

Among those States with low accessibility, for example, Hungary has average OECD policy scores, while Great Britain places great emphasis on labour market integration, with low benefits. As for Germany, it is characterized by average accessibility and high OECD policy scores. The remaining countries (including Italy) present an intermediate focus on passive policies and accessibility, as well as low investments in ALMPs. Therefore, environmental accessibility is certainly correlated with other disability policies, particularly integration policies, but not completely so. Perhaps most surprisingly, some of the countries with the highest values of the environmental accessibility index are characterized by welfare systems traditionally considered less than generous (i.e. Southern States) or by economies in transition (Esping-Andersen, 1990; Ferrera, 1996).

This is the case of Malta (Index = 0.85), Slovenia and Romania (both with Index = 0.81). It is possible that these countries invested in accessible infrastructure and transportation in order to attract more tourism (Tschanz and Staub, 2017).

Table 2 Environmental Accessibility Index and OECD (2010) policy scores

Country	Index	Compensation P.	Integration P.
Sweden	0.87	37	32
Malta	0.85	NA	NA
Finland	0.84	32	32
Denmark	0.82	28	37
Netherlands	0.81	24	35
Romania	0.81	NA	NA
Slovenia	0.81	NA	NA
Germany	0.80	32	35
Estonia	0.79	NA	NA
Spain	0.78	27	22
Latvia	0.74	NA	NA
Lithuania	0.74	NA	NA
Luxembourg	0.74	28	24
Austria	0.73	24	30
France	0.73	25	26
Poland	0.73	25	22
Bulgaria	0.72	NA	NA
Italy	0.72	26	18
Ireland	0.71	26	17
Portugal	0.70	33	16
United Kingdom	0.69	21	32
Belgium	0.68	25	24
Czech Republic	0.68	24	21
Greece	0.65	25	16
Hungary	0.59	28	28
Slovakia	0.58	26	21
Cyprus	0.57	NA	NA

The Environmental accessibility index is in the range 0-1, with Cronbach's alpha = 0.94. OECD (2010) policy scores range from 0 to 50.

The European Survey on Income and Living Conditions

The European Survey on Income and Living Conditions (EU-SILC) is an annual survey carried out in thirty-two European countries and addressed to individuals aged 16 or over living in private households. In year 2013, it included an ad hoc module on well-being.

Interviewees were asked to rate a variety of items on a scale from 0 to 10, with 0 being the minimum and 10 the maximum. Question items included Life Satisfaction and Meaning of Life, as well as common measures of social capital such as trust (in the political system, the police and other people in general).

Therefore, the analyses discussed in the present contribution were carried out using EU-SILC 2013 cross-sectional data. An interest in both labour market outcomes and environmental accessibility motivated the restriction of the sample to respondents aged 16-64 residing in EU member States or Great Britain.

Although invaluable as an interpretative framework, the human development model is as difficult to operationalize as the capabilities approach from which is derived (Buchardt, 2004). Therefore, respondents were identified as disabled people if they presented chronic conditions which limited them in activities "people usually do".

Conversely, individuals with no long-standing illness and individuals with chronic conditions which did not limit them in activities people usually do were classified as non-disabled. Furthermore,

Table 3 Summary statistics with description of the variables

Variable	Values/Range	Mean	S.D.
Life satisfaction	Likert scale (0-10)	7.01	2.07
Meaning of Life	Likert scale (0-10)	7.53	1.86
Woman	Dummy	0.51	0.50
Age			
	16-34	0.33	0.47
	35-54	0.44	0.50
	55-64	0.23	0.42
Partner	Dummy	0.61	0.49
Dependent children	Dummy	0.53	0.50
Migrant	Dummy	0.08	0.28
Disabled	Dummy	0.16	0.37
Degree of limitation			
	Moderately disabled	0.11	0.32
	Severely disabled	0.05	0.21
Education			
	Low education	0.25	0.43
	Medium education	0.49	0.50
	High education	0.26	0.44
Working status			
	Employed	0.61	0.49
	Unemployed	0.09	0.29
	Student	0.11	0.31
	NEET	0.19	0.39
Index		0.74	0.08
Equivalized household income (€)		14435.94	16473.45
Income quartile			
	≤ 2726.66 €	0.25	0.43
	≤ 11097.00 €	0.25	0.43
	≤ 21296.00 €	0.25	0.43
	≥ 21296.37 €	0.25	0.43
N	347,526		

The dummy *student* identifies respondents in education or training, while *NEET* is short for "not in employment, education or training".

disabled respondents whose long-standing conditions were associated with strong limitations in activities were categorized as severely disabled, the rest as moderately disabled (Powdthavee, 2009). As can be seen in **Table 3**, about one person in six is disabled, although severely disabled individuals make up only 5% of the sample. As for hedonic and eudaimonic well-being, they average 7 and 7.5, respectively. The relationship between the labour market and disability is examined in **Tables 4**, which computes the unemployment and inactivity rates based on current working status. More than six out of ten nondisabled respondents out of ten hold a job, while the employment rate of disabled people equals 40.19. The employment rate is inversely related to the degree of limitation in daily activities, with about one severely disabled respondent in four being employed.

Table 4 Labour market outcomes and disability

		Employment rate	Unemployment rate	Inactivity rate
Disability status				
	Nondisabled	64.03	13.03	26.38
	Disabled	40.19	20.66	49.34
Degree of limitation				
	Moderately disabled	47.25	18.50	42.03
	Severely disabled	23.49	29.56	66.65

Data is weighted. Author's calculations based on working status.

On the contrary, unemployment and inactivity rates rise with activity limitation, with almost 30% of severely disabled people being unemployed and almost seven out of ten out of the labour force altogether. To sum up, disability, particularly when severe, is associated with poor labour market outcomes. The next sub-section will outline the methodology applied in the present work.

Methodology

Firstly, the relevance of environmental accessibility to the eudaimonic and hedonic well-being, respectively, is tested in ordinary linear regressions with three main explanatory variables: a disability dummy, the environmental accessibility index and an interaction term between the two. Controls include State fixed effects, a migrant dummy and socio-demographic variables (working status among them). Secondly, new estimates are obtained by adding interaction terms between disability and working status, as holding a job narrows the differential in Life Satisfaction between disabled people and the rest (Bellia, unpublished).

In the second part of the present work, analyses are restricted to disabled people, with the aim of understanding if personal factors and resources affect the relationship between disability and happiness. In particular, it is investigated whether the relevance of accessibility to disabled persons changes depending on working status, age or household income. In order to do so, appropriate interaction terms between the environmental accessibility index and other variables of interest are introduced as explanatory variables in different regressions. Estimation results are discussed in the next section.

Results

Table 5 reports the results of two regressions with the same explanatory variables, but different dependent variables. In particular, regressors include the environmental accessibility index, the disability dummy and an interaction term between the two. Socio-demographic variables, migrant status, and country dummies are included as controls. The different outcome variables are Life Satisfaction and Meaning of Life, which account for hedonic and eudaimonic well-being, respectively.

As can be seen, disabled people are less happy compared to the rest of the population (Easterlin, 2006; Oswald and Powdthavee, 2008; Powdthavee, 2009), both in terms of eudaimonic and hedonic well-being.

As regards the environmental accessibility index, it has a positive association with both eudaimonic and hedonic well-being, even after introducing State fixed effects. Furthermore, the interaction term between disability and accessibility (Disabled # Accessibility) is positive and significant as well, whether Meaning of Life or Life Satisfaction are considered. This indicates that greater accessibility narrows the differential in happiness between individuals with and without disabilities or, adopting a different viewpoint, that inaccessible built environments generate unhappiness in those they exclude or marginalize (i.e. disabled respondents).

The relevance of environmental accessibility for the entire sample, rather than disabled people alone, has multiple possible explanations. In the first place, most disabled individuals have nondisabled relatives and friends, for whom lack of accessibility represents a negative externality. Furthermore, environmental accessibility is beneficial to families with children and/or elderly

people, as well as disabled people (Kafer, 2013).

Table 5 The impact of accessibility on happiness by disability status

ENTIRE SAMPLE	**Life Satisfaction**		**Meaning of Life**	
	Coefficient	*S.E.*	*Coefficient*	*S.E.*
Constant	-10.47***	(0.72)	-0.585	(0.72)
Accessibility	22.12***	(1.01)	9.577***	(1.01)
Disabled	-1.588***	(0.19)	-1.212***	(0.20)
Disabled # Accessibility	0.810**	(0.26)	0.770**	(0.27)
Woman	0.0702***	(0.01)	0.207***	(0.01)
Migrant	-0.233***	(0.03)	-0.101***	(0.03)
Partner	0.538***	(0.02)	0.357***	(0.02)
Dependent children	0.148***	(0.01)	0.199***	(0.01)
Age				
16-34	0.361***	(0.02)	0.0885***	(0.02)
55-64	0.196***	(0.02)	0.291***	(0.02)
Education				
Low education	-0.226***	(0.02)	-0.216***	(0.02)
High education	0.208***	(0.01)	0.123***	(0.01)
Economic status				
Employed	1.001***	(0.02)	0.749***	(0.03)
Student	1.603***	(0.03)	1.085***	(0.03)
NEET	0.749***	(0.03)	0.442***	(0.03)
Household income				
2nd income quartile	0.430***	(0.04)	0.276***	(0.03)
3rd income quartile	0.803***	(0.04)	0.489***	(0.04)
4th income quartile	1.154***	(0.04)	0.590***	(0.04)
Country dummies	Yes		Yes	
N	240239		235027	
Adj. R2	0.199		0.095	

Data is weighted. Heteroscedasticity robust standard errors in parentheses. Statistical significance: $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$. Base categories (not displayed) are: 35-54, nondisabled, single, medium education, unemployed, 1st income quartile.

Concerning demographic characteristics, women are happier than men (Conceição and Bandura, 2008) and migrant status is associated with a decrease in happiness (Hendriks, 2015), which is U-shaped in age (Blanchflower and Oswald, 2008). Household composition is also important, with partnered people happier than single respondents (Brown, 2000; Helliwell, 2003) and dependent children being associated with higher happiness (Conceição and Bandura, 2008).

As in previous literature, education is found to have a positive effect on both Life Satisfaction (Blanchflower and Oswald, 2004) and Meaning of Life. Furthermore, both eudaimonic and hedonic well-being increase with household income (Easterlin, 1974). As regards working status, people in education or training are by far the happiest, followed by workers, NEETs and the unemployed, i.e. the reference category.

The reason disabled students and trainees are characterized by the highest satisfaction and eudaimonic well-being, even after controlling for accessibility, may be connected to social capital and/or aspirations. Students and trainees have greater chances of meeting new people from different backgrounds and socializing with them both inside and outside educational settings, thus fostering their social capital. The latter, in turn, is essential to happiness (Bartolini, Bilancini and Pugno, 2013). As regards aspirations, if more education is indeed associated with higher earnings (Krueger and Ashenfelter, 1992), students might appreciate the opportunity to further their education. Furthermore, previous studies highlighted a significant differential in subjective well-being between workers and the unemployed, to the disadvantage of the latter (Di Tella, MacCulloch and Oswald,

2001; Frey and Stutzer, 2000, 2002). As for the fact that people who are inactive, but not in education or training, are happier than the unemployed, this difference might be due to the fact that unemployed individuals are frustrated by their unsuccessful job seeking efforts.

Table 6 The impact of accessibility and working status on happiness by disability status

ENTIRE SAMPLE	**Life Satisfaction**		**Meaning of Life**	
	Coefficient	*S.E.*	*Coefficient*	*S.E.*
Constant	-10.35***	(0.72)	-0.471	(0.71)
Accessibility	21.97***	(1.01)	9.458***	(1.01)
Disabled	-1.667***	(0.20)	-1.293***	(0.20)
Disabled # Accessibility	0.565*	(0.26)	0.570*	(0.27)
Woman	0.0609***	(0.01)	0.199***	(0.01)
Migrant	-0.234***	(0.03)	-0.103***	(0.03)
Partner	0.531***	(0.02)	0.351***	(0.02)
Dependent children	0.144***	(0.01)	0.196***	(0.01)
Age				
16-34	0.359***	(0.02)	0.0866***	(0.02)
55-64	0.190***	(0.02)	0.285***	(0.02)
Education				
Low education	-0.225***	(0.02)	-0.214***	(0.02)
High education	0.211***	(0.01)	0.126***	(0.01)
Economic status				
Employed	0.973***	(0.03)	0.705***	(0.03)
Student	1.598***	(0.03)	1.078***	(0.04)
NEET	0.837***	(0.03)	0.502***	(0.03)
Interaction terms				
Disabled # Employed	0.457***	(0.04)	0.436***	(0.04)
Disabled # Student	0.184	(0.13)	-0.143	(0.14)
Disabled # NEET	0	(.)	0	(.)
Household income				
2nd income quartile	0.433***	(0.04)	0.279***	(0.03)
3rd income quartile	0.808***	(0.04)	0.493***	(0.04)
4th income quartile	1.157***	(0.04)	0.592***	(0.04)
Country dummies	Yes		Yes	
N	240,239		235,027	
Adj. R2	0.201		0.097	

Data is weighted. Heteroscedasticity robust standard errors in parentheses. Statistical significance: $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$. Base categories (not displayed) are: 35-54, nondisabled, single, medium education, unemployed, 1st income quartile.

A detailed analysis of **Table 5** reveals how the signs and statistical significance of the coefficients associated with disability status, socio-demographic characteristics and accessibility are mostly the same in the Meaning of Life regression and in the subjective well-being (i.e. Life Satisfaction) regression. This might be due to the fact that both hedonic and eudaimonic well-being are self-reported measures, with the former referring to satisfaction with one's life taken as a whole[3], rather than one's emotional state at the time of the interview (Kashdan, Biswas-Diener and King, 2008).

One might make the case that the environmental accessibility index captures the effect of some other variable. In particular, previous work showed that being employed is particularly important for the subjective well-being of disabled people. This is why, in **Table 6**, interaction terms between disability and working status have been added among the regressors.

The interaction term between disability and employment is positive and statistically significant for

[3] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Archive:Quality_of_life_in_Europe_-_facts_and_views_-_overall_life_satisfaction&oldid=400088

both eudaimonic and hedonic well-being, meaning that disabled workers derive more happiness from being employed compared to their nondisabled colleagues, even though they are less happy than individuals without disabilities. This is probably due to the fact that disabled people are confronted with considerable in accessing the labour market (Jones, 2008). Neither the interaction term between disability and student (or trainee), nor that between disability and NEET are statistically significant.

It is important to note for our purposes that both the environmental accessibility index and its interaction with disability remain positive and statistically significant. This means that environmental accessibility is important (particularly to disabled people) for its own sake, and not only as a facilitator to labour market access. The likely reason is that labour market participation is just one form of societal participation, and accessibility affects other forms of participation as well, including education and leisure activities (Hästbacka, Nygård and Nyqvist, 2016).

Table 7 The effect of accessibility on the happiness of disabled people depending on age

DISABLED PEOPLE	**Life Satisfaction**		**Meaning of Life**	
	Coefficient	*S.E.*	*Coefficient*	*S.E.*
Constant	-14.92***	(2.23)	-4.827*	(2.15)
Accessibility	26.12***	(3.14)	13.83***	(3.04)
Woman	0.138***	(0.04)	0.314***	(0.04)
Migrant	-0.302***	(0.09)	-0.126	(0.08)
Partner	0.745***	(0.04)	0.568***	(0.04)
Dependent children	0.116**	(0.04)	0.203***	(0.04)
Age				
16-34	1.763**	(0.61)	1.498*	(0.65)
55-64	0.124	(0.39)	-0.459	(0.39)
Interaction terms				
Acc. # 16-34	-1.780*	(0.82)	-1.868*	(0.87)
Acc. # 55-64	0.339	(0.52)	1.299*	(0.52)
Education				
Low education	-0.153**	(0.05)	-0.200***	(0.05)
High education	0.299***	(0.05)	0.161***	(0.05)
Working status				
Employed	1.086***	(0.07)	0.931***	(0.07)
Student	1.601***	(0.14)	0.935***	(0.16)
NEET	0.479***	(0.07)	0.255***	(0.07)
Household income				
2nd income quartile	0.497***	(0.11)	0.245*	(0.10)
3rd income quartile	1.034***	(0.12)	0.587***	(0.12)
4th income quartile	1.488***	(0.12)	0.780***	(0.12)
Country dummies	Yes		Yes	
Acc. + Acc. # 16-34	24.341***	(3.15)	11.958***	(3.10)
Acc. + Acc. # 55-64	26.460***	(3.10)	15.124***	(3.02)
N	39,616		38,452	
Adj. R2	0.168		0.104	

Data is weighted. Heteroscedasticity robust standard errors in parentheses. Statistical significance: $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$. Base categories (not displayed) are: 35-54, nondisabled, single, medium education, unemployed, 1st income quartile.

In **Table 7** the analysis is restricted to disabled people, with the aim of establishing whether the relationship between happiness and environmental accessibility changes depending on age.As can be seen, the coefficient associated with environmental accessibility remains positive and significant even after adding interaction terms between age and accessibility. Moreover, it is considerably larger than in the previous regressions, confirming that accessibility is considerably more important

to disabled than to nondisabled people (which make up over three quarters of the entire sample).

Regarding age, the coefficient associated with the 55-64 dummy changes sign across regressions and is not statistically significant, while 16 to 34 year olds are characterized by higher hedonic and eudaimonic well-being compared to middle aged disabled people, who represent the reference category.

The interaction terms between the environmental accessibility index and age dummies have the same sign regardless of the outcome variable. They indicate that the positive impact of accessibility on the eudaimonic well-being of disabled people grows in magnitude with age. As for hedonic well-being, disabled people aged 35 or over value environmental accessibility more than younger disabled people, but the coefficient associated with the 55-64 dummy (though positive) is not statistically significant.

It is worth noting here that all income quartile dummies are positive and statistically significant, with their magnitude suggesting that happiness increases with household income. These results might be due to the fact that, as disabled people grow older their impairments become more severe and/or their general health declines, making environmental accessibility a even more essential.

Table 8 The effect of accessibility on the happiness of disabled people depending on income

DISABLED PEOPLE	**Life Satisfaction**		**Meaning of Life**	
	Coefficient	*S.E.*	*Coefficient*	*S.E.*
Constant	-16.11***	(2.46)	-6.113*	(2.43)
Accessibility	27.68***	(3.41)	15.51***	(3.37)
Woman	0.137***	(0.04)	0.313***	(0.04)
Migrant	-0.301***	(0.09)	-0.127	(0.08)
Partner	0.745***	(0.04)	0.568***	(0.04)
Dependent children	0.124**	(0.04)	0.213***	(0.04)
Age				
16-34	0.432***	(0.06)	0.102	(0.07)
55-64	0.378***	(0.04)	0.510***	(0.04)
Education				
Low education	-0.152**	(0.05)	-0.199***	(0.05)
High education	0.298***	(0.05)	0.159***	(0.05)
Working status				
Employed	1.090***	(0.07)	0.935***	(0.07)
Student	1.572***	(0.14)	0.893***	(0.16)
NEET	0.482***	(0.07)	0.256***	(0.08)
Household income				
2nd income quartile	0.699	(0.90)	0.280	(0.95)
3rd income quartile	2.217+	(1.17)	1.207	(1.21)
4th income quartile	3.768**	(1.26)	3.544**	(1.30)
Interaction terms				
Acc. # 2nd income quartile	-0.266	(1.17)	-0.0455	(1.23)
Acc. # 3rd income quartile	-1.573	(1.54)	-0.825	(1.59)
Acc. # 4th income quartile	-3.030+	(1.66)	-3.675*	(1.70)
Country dummies	Yes		Yes	
Acc. + Acc. # 2nd income quartile	27.415***	(3.22)	15.461***	(3.18)
Acc. + Acc. # 3rd income quartile	26.108***	(3.12)	14.681***	(3.06)
Acc. + Acc. # 4th income quartile	24.651***	(3.20)	11.832***	(3.04)
N	39,616		38,452	
Adj. R2	0.168		0.104	

Data is weighted. Heteroscedasticity robust standard errors in parentheses. Statistical significance: +p < 0.10, *p < 0.05, **p < 0.01, ***p < 0.001. Base categories (not displayed) are: 35-54, nondisabled, single, medium education, unemployed, 1st income quartile.

In **Table 8**, the interaction terms between accessibility and age are replaced new ones, in order to investigate the impact of household income on the relationship between accessibility and happiness. The coefficient of the environmental accessibility index is again positive and significant in both regressions. Furthermore, happiness is U-shaped in age, both in the Life Satisfaction and in the Meaning of Life regression. Moreover, both eudaimonic and hedonic well-being increase with household income. Similarly to what happened in **Table 7** for age, however, the estimates of some of the dichotomous variables capturing household income lose statistical significance once interaction terms with accessibility are introduced. In particular, the coefficient associated with the second income quartile (in both regressions) and that associated with the third income quartile (in the eudaimonic well-being regression only).

Interaction terms indicate the that impact of accessibility on both hedonic and eudaimonic well-being lessens considerably as household income rises. This result should be considered with caution, however, since only the interaction term between accessibility and the highest income quartile is statistically significant, regardless of how happiness is defined. It can certainly be stated that accessibility is comparatively less relevant to the non material well-being of disabled people in the highest income quartile, which stands to reason. In fact, disabled people with higher incomes are able to afford more resources, including goods and services that might be just as capability enhancing, if not more so, than accessible and built environments.

To sum up, environmental accessibility has a positive effect on both Life Satisfaction and Meaning of Life for all interviewees, but such effect is considerably greater for disabled people. Thus, higher accessibility reduces the gap in happiness (however defined) between disabled and nondisabled individuals, to the advantage of the latter. This result is robust to the introduction of interaction terms between disability and working status, suggesting that the impact of environmental accessibility on the lived experience of disabled individuals goes beyond labour market outcomes, affecting social participation in general, as well as individual agency.

Furthermore, the impact of accessibility on the hedonic and eudaimonic well-being of disabled people changes with their personal characteristics. In particular, the importance of accessibility for non material well-being increases with age and drops as household income rises. This means that environmental accessibility could improve the quality of life of many disabled individuals. In fact, disabled individuals are older than nondisabled people, as their average age is 49.63, while that of individuals without disabilities is 40.31. Furthermore, disabled persons are at higher risk of poverty and social exclusion[4] compared to the rest of the population. The next section discusses identification and measurement issues.

Identification and measurement issues

This section analyses identification and measurement issues related to disability and environmental accessibility.

Disability

As mentioned in the data and methodology section, survey respondents were identified as disabled

[4] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Disability_statistics_-_poverty_and_income_inequalities

if they had any chronic (long-standing) illness or condition which limited them in activities people usually do. In order to identify disabled people, then, answers to two health related questions (PH020 and PH030) were combined.

However, the reference to activities "people usually do" is quite generic, which poses a problem. One the one hand, individuals who are not usually considered disabled might be classified as such. For instance, if respondents believe that eating gluten is an activity people usually do (which is indeed the case in a number of countries), celiac interviewees might be identified as disabled. On the other hand, while it may be hard for anyone to conceptualize hearing as something people usually do (as one cannot just stop hearing at will), that might be especially challenging for a deaf respondent. This could lead to erroneously categorizing deaf people as non-disabled. Therefore, there is an identification problem when it comes to disabled respondents, which could be minimized if question PH030 provided a list of activities "people usually do". There are a number of possible lists, the most well known being Activities of Daily Living and Instrumental Activities of Daily Living (Mont, 2007).

It is worth noting, however, that most literature on the topic identifies disabled people according to the same criteria applied in the present work.

In fact, the disability prevalence rate obtained in this contribution (16%) is identical to that reported by the OECD (2010), according to which about one person in six is disabled among the active population.

Environmental accessibility

This sub-section will provide a few examples that illustrate the meaning of accessibility to individuals with different disabilities. Most importantly, these examples will shed light on how well the items included in the 2012 Eurobameter survey on the topic capture environmental accessibility itself.

Example 1. If a deaf person decided to go to the cinema, they would undoubtedly be able to enter the building where the cinema was housed. However, they would not be able to enjoy the movie they intended to watch if closed captioning was not provided. Therefore, the mere lack of difficulties when it comes to entering a public building does not guarantee that said building will be accessible to everyone.

Example 2. Suppose a blind person has to cross the street at a traffic light. This is something they are technically able to do on their own without issue. However, they are exposed to a higher risk of being run down by a car compared to most sighted individuals if no audible traffic signals indicate when the semaphore for pedestrians turns green. This is why audible traffic signals are considered an accessibility feature.

Example 3. Let us consider a person with autism spectrum disorder who has to take a flight. This requires them to enter a crowded, noisy environment with bright lights and strong scents that is over-stimulating and thus overwhelming to them. As a result, they might find it extremely difficult, if not impossible, to board a plane unassisted. Assistants to disabled passengers should usher autistic people to an especially designed quiet room to wait, then guide them through security

checks ahead of other passengers and help them board the aircraft[5]. Furthermore, some autistic passengers might need the assistance of specialized personnel not only to prevent sensory over-stimulation, but also in order to understand, for instance, when to show their passport, how to go through security or how to find the right gate[6]. It is clear, then, how the availability of special assistance is itself a form of accessibility.

These are only some of the ways in which environmental accessibility grants disabled people the freedom to fully access different physical environments without putting their lives at risk or experiencing undue stress. As *Example 1* highlights, the items included in the 2012 Eurobameter survey on accessibility are not fully comprehensive. However, they cover a wide range of activities and are (to date) the only international proxy of accessibility available.

Robustness checks and additional analyses are the subject of the next session.

Robustness checks and additional analyses

Robustness checks

Model selection required a variety of tests, with the objective of finding the most appropriate specification.

In particular, it was necessary to understand whether the environmental accessibility index might be included as a regressor on its own, if State fixed effects were required as well (as it was indeed the case) or if it would be best to include variables capturing differences in welfare state systems (Esping-Andersen, 1990; Ferrera, 1996).

The selection process proceeded as follows. Firstly, separate regressions with the environmental accessibility index as dependent variable were estimated. In one, the regressors were country dummies, in the other a single explanatory variable was included. The latter classified welfare systems as Anglo-Saxon (reference), Bismarckian, Eastern, Scandinavian or Southern. Variance inflation factors were computed for all regressors and were all minor than 10, indicating collinearity between the environmental accessibility index and country dummies (as well as welfare system dummies) was low enough. Results are reported in the Appendix (**Table A1**).

Thus, either State fixed effects or the welfare system variable might be included as regressors together with the environmental accessibility index, if needed.

In order to test whether the index could be included as sole regressor or not, F tests for multiple linear restrictions were conducted on regressions with Life Satisfaction (**Table A2**) and Meaning of Life (**Table A3**) as dependent variables. Working status, a disability dummy, socio-demographic variables and social capital were included as explanatory variables in all models.

The restricted model included only the environmental accessibility index, the one dubbed "Unrestricted Model (1)" had country dummies as well, while in the "Unrestricted Model (2)" State

[5] https://www.washingtonpost.com/travel/2019/07/29/pittsburghs-airport-is-latest-create-sensory-friendly-space-travelers-with-autism/
[6] https://www.klm.com/travel/us_en/prepare_for_travel/travel_planning/special_assistance/passengers_disability.htm

fixed effects were replaced by the welfare system variable.

The null hypothesis that State fixed effects were jointly not significantly different from zero was rejected and so was a similar hypothesis concerning the welfare system categorical variable. This was true for both hedonic and eudaimonic well-being. In other words, including the environmental accessibility index alone would lead to the omission relevant variables capturing national characteristics.

The choice between State fixed effects and the welfare system variable was based on a comparison between the explanatory power of the corresponding models. Whether subjective well-being or Meaning of Life was considered, the adjusted R squared of the model including country dummies was higher than that of the model with the welfare system variable. Therefore, State fixed effects were preferred over welfare system characteristics.

Additional analyses

The impact of accessibility on the happiness of disabled people depending on gender (**Table A4**), working status (**Table A5**) and degree of limitation in activities people usually do (**Tables A6** and **A7**) was investigated as well.

Environmental accessibility is less relevant to the Life Satisfaction (but not the eudaimonic well-being) of women with disabilities. It is possible that structural factors, such as traditional gender roles, affect valued objectives of disabled women. Disabled individuals in education or training value accessibility less than the unemployed. When Meaning of Life is considered, environmental accessibility has the greatest impact on job seekers, followed by workers, disabled NEETs, and finally students. Structural factors, such as barriers to accessing education and training, and personal factors, such time availability, might explain these differences. Furthermore, severely disabled people experience lower happiness compared to those with moderate limitations (Uppal, 2006).

Stratification by degree of limitation suggests that both accessibility and household income may be comparetely more relevant to the happiness of severely disabled individuals. If that was the case, then people with more severe health deprivations would require additional personal and structural resources to have an adequate standard of living.The results of these additional analyses are discussed in more detail in the appendix. The next section presents conclusions and policy recommendations.

Conclusion and policy recommendations

Conclusion

The present contribution aimed at investigating the effect of environmental accessibility on the hedonic (i.e. Life Satisfaction) and eudaimonic (i.e. Meaning of Life) well-being of disabled people.

In the first place, there was an interest in whether the relationship between disability and happiness was mediated by accessibility. Additionally, the effect of accessibility on the happiness of disabled individuals might vary according to their personal characteristics, such as age and household income and this possibility needed to be investigated.

Therefore, an environmental accessibility index was built based on the 2012 Eurobameter Survey

on accessibility. Concerning the first point, it was found that the positive effect of accessibility on happiness is stronger for disabled people. In fact, the differential in happiness between nondisabled and disabled people, to the advantage of the former, narrows when built environment are characterized by higher accessibility.

Furthermore, this result is robust to the introduction of interaction terms between working status and disability, indicating that the relevance of accessibility to Life Satisfaction and Meaning of Life goes far beyond its impact on labour market outcomes. It should be noted that the interaction term between disability and employment was positive and significant as well, indicating that holding a job has the same effect on the happiness gap between disabled and nondisabled people that high accessibility does.

As mentioned before, environmental accessibility has a positive impact on the hedonic and eudaimonic well-being of nondisabled people as well. In fact, while lack of accessibility clearly restricts the freedom of disabled people more than that of individuals without disabilities, even in households with no disabled members there might be children and especially individuals over 64, since European population is ageing rapidly[7] . Despite not having a disability, the latter may experience at least some difficulties with inaccessible built environments, resulting negative spill-over effects on the hedonic and eudaimonic well-being of their entire households.

Among disabled people, the impact of accessibility on happiness is more pronounced for people aged 35-54 than among those 34 or younger, while disabled respondents over 54 appreciate accessibility the most. Moreover, disabled individuals in the highest income quartile value accessibility the least.

Policy recommendations

Investments in building accessible infrastructure and transportation (or making existing infrastructure and transportation accessible), would increase the well-being of both disabled people and society as a whole. It would be a mistake, however, to think that environmental accessibility alone would grant disabled people an adequate standard of living, let alone happiness.

As this contribution makes clear, disabled people still experience barriers to accessing the labour market. They might result from employer discrimination (Hästbacka et al., 2016) and/or lower qualifications of disabled people. In fact, both children (UNESCO, 2018) and adults (Jones and Sloane, 2010) with disabilities are less educated than their nondisabled peers on average. On the one hand, a more rigorous application anti-discrimination laws and quota systems (Lavile et al., 2009), whenever present, could reduce employer discrimination. On the other hand, the removal of existing barriers to education (Ebersold et al., 2011) and vocational training (Waddington, 2018) for disabled people, coupled with higher investments in tailored ALMPs, would increase the job skills of this collective.

Furthermore, it was found that disabled people compensate for lack of accessibility with household income. This result is in line with previous literature, which highlights that disability is accompanied by extra-costs (Zaidi and Burchardt, 2005). As already mentioned, disabled people

[7] https://ec.europa.eu/eurostat/statistics-explained/index.php/Population_structure_and_ageing#The_share_of_elderly_people_continues_to_increase

are also at higher risk of poverty and social exclusion. Therefore, disability benefits should not be diminished as suggested by the OECD (2010), but increased (Parodi and Sciulli, 2008). Since social capital is very important for happiness, efforts should be made to ensure the full inclusion of disabled people in the community (The United Nations, 2006, art. 19). To this aim, personal budgets, direct payments and other individualised funding systems are particularly effective (Šiška et al., 2018).

To conclude, narrowing the happiness gap between disabled and nondisabled people requires a range of interventions, including interventions to make the built environment accessible.

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APPENDIX

Table A1 Testing for multicollinearity

ACCESSIBILITY	**Country dummies**		**Welfare system**	
	Coefficient	*VIF*	*Coefficient*	*VIF*
Austria	0.727***	(1.00)		
Belgium	0.677***	(1.00)		
Bulgaria	0.725***	(1.00)		
Cyprus	0.574***	(1.00)		
Czech Republic	0.681***	(1.00)		
Germany	0.799***	(1.00)		
Denmark	0.822***	(1.00)		
Estonia	0.787***	(1.00)		
Greece	0.650***	(1.00)		
Spain	0.783	(1.00)		
Finland	0.843***	(1.00)		
France	0.733***	(1.00)		
Hungary	0.591***	(1.00)		
Ireland	0.708***	(1.00)		
Italy	0.716***	(1.00)		
Lithuania	0.739***	(1.00)		
Luxembourg	0.737***	(1.00)		
Latvia	0.743***	(1.00)		
Malta	0.851***	(1.00)		
Netherlands	0.813***	(1.00)		
Poland	0.727***	(1.00)		
Portugal	0.696***	(1.00)		
Romania	0.812***	(1.00)		
Sweden	0.870***	(1.00)		
Slovenia	0.813***	(1.00)		
Slovakia	0.578***	(1.00)		
United Kingdom	0.692***	(1.00)		
Anglo-Saxon			0.692***	(1.00)
Bismarckian			0.740***	(1.00)
Eastern			0.722***	(1.00)
Scandinavian			0.808***	(1.00)
Southern			0.733***	(1.00)
Observations	346727		330404	
Mean VIF		1.00		1.00

Regressions without constant. Data is weighted. Variance Inflation Factors in parentheses. Statistical significance: $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table A2 Testing multiple linear restrictions - Life Satisfaction

LIFE SATISFACTION	**Restricted Model**		**Unrestricted Model (1)**		**Unrestricted Model (2)**	
	Coefficient	*S.E.*	*Coefficient*	*S.E.*	*Coefficient*	*S.E.*
Constant	2.721***	(0.07)	-10.57***	(0.72)	2.114***	(0.08)
Accessibility	3.799***	(0.08)	22.25***	(1.01)	4.436***	(0.09)
Disabled	-0.944***	(0.02)	-0.984***	(0.02)	-0.983***	(0.02)
Woman	0.0664***	(0.01)	0.0707***	(0.01)	0.0605***	(0.01)
Migrant	-0.270***	(0.03)	-0.232***	(0.03)	-0.236***	(0.03)
Partner	0.523***	(0.01)	0.538***	(0.02)	0.562***	(0.01)
Dependent children	0.170***	(0.01)	0.148***	(0.01)	0.157***	(0.01)
Age						
16-34	0.376***	(0.02)	0.361***	(0.02)	0.365***	(0.02)
55-64	0.221***	(0.02)	0.196***	(0.02)	0.202***	(0.02)
Education						
Low education	-0.311***	(0.02)	-0.227***	(0.02)	-0.235***	(0.02)
High education	0.224***	(0.01)	0.208***	(0.01)	0.214***	(0.01)
Working status						
Employed	1.131***	(0.02)	1.000***	(0.02)	1.008***	(0.03)
Student	1.713***	(0.03)	1.602***	(0.03)	1.623***	(0.03)
NEET	0.867***	(0.03)	0.748***	(0.03)	0.754***	(0.03)
Household income						
2nd income quartile	-0.152***	(0.02)	0.430***	(0.04)	0.139***	(0.03)
3rd income quartile	0.0758***	(0.02)	0.802***	(0.04)	0.425***	(0.03)
4th income quartile	0.455***	(0.02)	1.153***	(0.04)	0.788***	(0.03)
Welfare system						
Bismarckian					0.0447	(0.03)
Eastern					0.451***	(0.03)
Scandinavian					-0.216***	(0.03)
Southern					-0.266***	(0.03)
Country dummies	No		Yes		No	
N	240239		240239		230319	
Adj. R2	0.164		0.199		0.173	
Prob. > F						
	UR (1)	0.000				
	UR (2)	0.000				

Data is weighted. Heteroscedasticity robust standard errors in parentheses. Statistical significance: $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$. Base categories (not displayed) are: 35-54, nondisabled, single, medium education, unemployed, 1st income quartile.

Table A3 Testing multiple linear restrictions - Meaning of Life

MEANING OF LIFE	**Restricted Model**		**Unrestricted Model (1)**		**Unrestricted Model (2)**	
	Coefficient	*S.E.*	*Coefficient*	*S.E.*	*Coefficient*	*S.E.*
Constant	5.495***	(0.07)	-0.676	(0.72)	4.391***	(0.08)
Accessibility	1.105***	(0.09)	9.701***	(1.01)	2.516***	(0.09)
Disabled	-0.638***	(0.02)	-0.638***	(0.02)	-0.627***	(0.02)
Woman	0.195***	(0.01)	0.207***	(0.01)	0.202***	(0.01)
Migrant	-0.108***	(0.03)	-0.101***	(0.03)	-0.0795**	(0.03)
Partner	0.373***	(0.01)	0.357***	(0.02)	0.398***	(0.01)
Dependent children	0.213***	(0.01)	0.200***	(0.01)	0.196***	(0.01)
Age						
16-34	0.0929***	(0.02)	0.0885***	(0.02)	0.0939***	(0.02)
55-64	0.289***	(0.02)	0.291***	(0.02)	0.292***	(0.02)
Education						
Low education	-0.186***	(0.02)	-0.217***	(0.02)	-0.200***	(0.02)
High education	0.157***	(0.01)	0.123***	(0.01)	0.124***	(0.01)
Working status						
Employed	0.786***	(0.03)	0.748***	(0.03)	0.740***	(0.03)
Student	1.118***	(0.03)	1.083***	(0.03)	1.101***	(0.04)
NEET	0.467***	(0.03)	0.441***	(0.03)	0.418***	(0.03)
Household income						
2nd income quartile	0.00975	(0.02)	0.275***	(0.03)	0.192***	(0.03)
3rd income quartile	0.0687***	(0.02)	0.488***	(0.04)	0.363***	(0.03)
4th income quartile	0.154***	(0.02)	0.589***	(0.04)	0.483***	(0.03)
Welfare system						
Bismarckian					-0.340***	(0.02)
Eastern					0.234***	(0.03)
Scandinavian					-0.447***	(0.03)
Southern					-0.0718**	(0.02)
Country dummies	No		Yes		No	
N	235,027		235,027		225385	
Adj. R2	0.072		0.095		0.078	
Prob. > F						
	UR (1)	0.000				
	UR (2)	0.000				

Data is weighted. Heteroscedasticity robust standard errors in parentheses. Statistical significance: $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$. Base categories (not displayed) are: 35-54, nondisabled, single, medium education, unemployed, 1st income quartile.

Table A4 The effect of accessibility on the happiness of disabled people depending on gender

DISABLED PEOPLE	**Life Satisfaction**		**Meaning of Life**	
	Coefficient	*S.E.*	*Coefficient*	*S.E.*
Constant	-15.19***	(2.24)	-4.971*	(2.15)
Accessibility	26.47***	(3.14)	14.01***	(3.03)
Migrant	-0.300***	(0.09)	-0.125	(0.08)
Partner	0.743***	(0.04)	0.566***	(0.04)
Dependent children	0.119**	(0.04)	0.209***	(0.04)
Gender				
Woman	0.901*	(0.37)	0.470	(0.38)
Acc. # Woman	-1.024*	(0.50)	-0.210	(0.51)
Age				
16-34	0.432***	(0.06)	0.0997	(0.07)
55-64	0.378***	(0.04)	0.511***	(0.04)
Education				
Low education	-0.154***	(0.05)	-0.204***	(0.05)
High education	0.297***	(0.05)	0.159***	(0.05)
Working status				
Worker	1.084***	(0.07)	0.928***	(0.07)
Student	1.581***	(0.14)	0.904***	(0.16)
NEET	0.477***	(0.07)	0.251***	(0.07)
Household income				
2nd income quartile	0.505***	(0.11)	0.254*	(0.10)
3rd income quartile	1.043***	(0.12)	0.596***	(0.12)
4th income quartile	1.497***	(0.12)	0.788***	(0.12)
Country dummies	Yes		Yes	
Acc. + Acc. # Woman	25.446***	(3.09)	13.803***	(3.02)
N	39616		38452	
Adj. R2	0.168		0.104	

Data is weighted. Heteroscedasticity robust standard errors in parentheses. Statistical significance: $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$. Base categories (not displayed) are: 35-54, nondisabled, single, medium education, unemployed, 1st income quartile.

As can be seen in **Table A4**, when an interaction term between gender and accessibility is introduced, the woman dummy loses (some or all) statistical significance. As regards the signs of the coefficients, disabled women are more satisfied with their lives compared to men, which is in life with the literature on subjective well-being. However, they appear to value accessibility less than their male counterparts, at least when it comes to Life Satisfaction. In eudaimonic well-being regression, on the other hand, the interaction term between accessibility and gender is not statistically significant. The diminished importance of accessibility for women with disabilities could be explained by the fact that they travel less often and for shorter distances compared to men (Ng and Acker, 2018), which means they get out of their house less frequently. This, in turn, could be connected to the spatial separation between productive and reproductive work (Levy, 2013), with the latter taking place inside the household and traditionally assigned to women (Federici, 2004). In fact, women dedicate much more time to housework compared to men (Bird and Fremont, 1991).

This is an example of how structural factors, such as widespread believes about reproductive work, can combine with personal factors like gender to influence individual value systems and, through them, subjective well-being.

Table A5 Accessibility, happiness and working status (disabled people)

DISABLED PEOPLE	Life Satisfaction		Meaning of Life	
	Coefficient	*S.E.*	*Coefficient*	*S.E.*
Constant	-13.95***	(2.29)	-4.136+	(2.25)
Accessibility	25.97***	(3.11)	14.73***	(3.04)
Woman	0.138***	(0.04)	0.315***	(0.04)
Migrant	-0.300***	(0.09)	-0.128	(0.08)
Partner	0.745***	(0.04)	0.568***	(0.04)
Dependent children	0.116**	(0.04)	0.206***	(0.04)
Age				
16-34	0.430***	(0.06)	0.101	(0.07)
55-64	0.378***	(0.04)	0.512***	(0.04)
Education				
Low education	-0.155***	(0.05)	-0.201***	(0.05)
High education	0.299***	(0.05)	0.160***	(0.05)
Working status				
Employed	0.349	(0.68)	0.883	(0.74)
Student/Trainee	3.998***	(1.20)	3.436*	(1.34)
NEET	-0.381	(0.68)	-1.127	(0.74)
Interaction terms				
Acc. # Employed	-0.169	(0.55)	-1.794**	(0.55)
Acc. # Student	-4.304**	(1.40)	-5.162***	(1.56)
Acc. # NEET	-1.152	(0.92)	-1.857+	(1.01)
Household income				
2nd income quartile	0.500***	(0.11)	0.253*	(0.10)
3rd income quartile	1.035***	(0.12)	0.594***	(0.12)
4th income quartile	1.486***	(0.12)	0.787***	(0.12)
Country dummies	Yes		Yes	
Acc. + Acc. # Employed	25.800***	(3.13)	12.937***	(3.01)
Acc. + Acc. # Student	21.666***	(3.39)	9.569*	(3.36)
Acc. + Acc. # NEET	24.817***	(3.20)	12.874***	(3.16)
N	39616		38452	
Adj. R2	0.168		0.104	

Data is weighted. Heteroscedasticity robust standard errors in parentheses. Statistical significance: $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$. Base categories (not displayed) are: 35-54, nondisabled, single, medium education, unemployed, 1st income quartile.

In **Table A5**, interaction terms between working status and accessibility are added among the explanatory variables. Therefore, most working status dummies are no longer significant. In fact, only the dichotomous variable identifying students and trainees is statistically different from zero. Concerning the interaction terms themselves, they are all negative. These two statements are true for both eudaimonic and hedonic well-being. Another commonality between the two estimates is that accessibility is valued least (in terms of non-material well-being) by students and trainees. What distinguishes the two regressions is the significance of the interaction terms.

In the Life Satisfaction regression only Acc. # Student is statistically significant, while when it comes to eudaimonic well-being all interaction terms are significantly different from zero. These different results may reflect differences in what Life Satisfaction and Meaning of Life actually measure. It seems that, while the interaction between accessibility working status has a limited impact on disabled people hedonic well-being, i.e. the pleasure they derive from their lives, it is very relevant to their eudaimonic well-being, that is connected to their human flourishing and their societal role (Bruni, 2010).

For the propose of making sense of their own lives, unemployed disabled people value accessibility the most, followed by workers, people outside the labour force who are not in education or training and students or trainees themselves.

I will illustrate the importance of environmental accessibility for disabled job-seekers with an example. If a wheelchair user was going to a job interview by city bus, they would have to go through the following steps just to get on public transportation:

a) Checking if the bus stops they need are accessible
b) Booking the assistance several hours earlier (48 in Rome[8], 36 in Pisa[9])

Step b) is not mandatory in every European country, but it is strongly recommended. In fact, each bus has only one space reserved for wheelchair users and they are obliged to stay there. As a consequence, bus drivers are instructed not to let more than one wheelchair user on at the same time[10]. Supposing the job-seeker of our examples manages to get on and off the bus on time , they might face other obstacle as well. The building they need to access may not have an elevator (or the elevator might be broken at that time) and/or the attached sidewalk may have no cut curb. Lack of environmental accessibility may thus result in lost job opportunities, especially when these opportunities come at short notice (Adams et al., 2019). It is understandable, then, that accessibility has the greatest impact on the eudaimonic well-being of unemployed disabled people.

It is also clear that time availability and planning are key resources when it comes to compensating for inaccessibility. From this perspective, having a regular schedule might help workers and students plan their way around lack of accessibility.

As for disabled NEETs, not only do they have the opportunity compensate for inaccessibility, but they can make their own schedule, minimizing the impact of limited environmental access on their eudaimonic well-being.

The fact that disabled people in education or training value environmental accessibility the least has multiple possible explanations. Firstly, disabled students and trainees may have more time at their disposal compared to disabled workers. Secondly, being able to get to school, university or college and enter the building does not immediately translate into access to education. In fact, support for disabled students in high school and higher education is often lacking (Ebersold et al., 2011). As for vocational training programmes, few of them are designed so as to enable disabled individuals to acquire job skills (Waddington, 2018).

[8] https://www.tibusroma.it/servizi-tibus-assistenza-ai-viaggiatori-con-disabilita-e-mobilita-ridotta-ecco-i-dettagli/[in Italian]
[9] https://pisa.cttnord.it/Assistenza_PMR/P/598 [In Italian]
[10] https://www.mirror.co.uk/news/uk-news/disabled-brothers-left-stranded-after-9218359

Table A6 Stratification by degree of limitation (Life Satisfaction)

LIFE ATISFACTION	**All disabled**		**Moderately disabled**		**Severely disabled**	
	Coefficient	*S.E.*	*Coefficient*	*S.E.*	*Coefficient*	*S.E.*
Constant	-12.86***	(2.20)	-10.69***	(2.55)	-15.87***	(4.29)
Severely disabled	-0.843***	(0.04)				
Accessibility	23.82***	(3.09)	21.04***	(3.56)	26.42***	(6.08)
Woman	0.0914*	(0.04)	0.0892*	(0.04)	0.0813	(0.07)
Migrant	-0.332***	(0.09)	-0.487***	(0.11)	0.0556	(0.16)
Partner	0.699***	(0.04)	0.669***	(0.05)	0.750***	(0.08)
Dependent children	0.0962*	(0.04)	0.108*	(0.05)	0.0811	(0.08)
Age						
16-34	0.387***	(0.06)	0.379***	(0.07)	0.369**	(0.14)
55-64	0.338***	(0.04)	0.259***	(0.05)	0.448***	(0.08)
Education						
Low education	-0.135**	(0.05)	-0.221***	(0.05)	0.0133	(0.09)
High education	0.270***	(0.05)	0.270***	(0.05)	0.262*	(0.11)
Working status						
Employed	0.993***	(0.07)	0.881***	(0.07)	1.289***	(0.14)
Student	1.497***	(0.14)	1.384***	(0.15)	1.758***	(0.34)
NEET	0.599***	(0.07)	0.639***	(0.08)	0.600***	(0.13)
Household income						
2nd income quartile	0.497***	(0.11)	0.523***	(0.11)	0.484*	(0.22)
3rd income quartile	1.022***	(0.12)	1.025***	(0.13)	1.034***	(0.24)
4th income quartile	1.440***	(0.12)	1.407***	(0.13)	1.530***	(0.25)
Country dummies	Yes		Yes		Yes	
N	39616		28388		11228	
Adj. R2	0.192		0.162		0.139	

Data is weighted. Heteroscedasticity robust standard errors in parentheses. Statistical significance: $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$. Base categories (not displayed) are: 35-54, nondisabled, single, medium education, unemployed, 1st income quartile.

Table A6 presents three regressions, all with hedonic well-being as a dependent variable. The first one includes all disabled people, regardless of their degree of limitation. Accessibility and all the usual controls are included among the regressor, with the addition of a severe disability dummy. Severely disabled people reported chronic conditions which limit them strongly in activities people usually do. As can be seen, severe limitations have a significantly negative impact on subjective well-being, with the associated coefficient equal to -0.843. This result is in line with previous findings by Uppal (2006). The coefficient associated with the environmental accessibility index is a little under 24 and statistically significant. The second regression is restricted to disabled individuals whose limitations are not severe. The coefficient associated with the environmental accessibility index, though still positive and significant, shrank to 21.04.The third regression analyses severely disabled respondents only. The regression coefficient of accessibility here equals 26.42.

Therefore, it appears that environmental accessibility might be more important to Life Satisfaction of severely disabled people than to that of respondents with moderate limitations. Unfortunately, there is no way to verify this claim, as disabled people with strong limitations are so few that adding an interaction term between accessibility and severe disability in the first regression would yield no significant results[11].

However, the fact that accessibility is most relevant to the hedonic well-being of people over 54 and

[11] Estimates are available upon request.

matters the least to disabled people aged 34 or younger does suggest that strong limitations might be accompanied by a greater need for accessible transportation and built environments.

Another difference between severe and moderate disabled people when it comes to subjective well-being concerns household income. While the coefficient associated with the second income quartile is greater among individuals with moderate limitations, the opposite is true of the coefficients associated with higher quartiles. The 4th income quartile dummy has a coefficient of1.407 when the sample is restricted to moderately disabled individuals, which rises to 1.530 among the severely disabled people. Once again, there is no way to verify whether this differences are statistically significant.

Similar results are obtained for Meaning of Life (**Table E7**), with severely disabled individuals characterized by lower eudaimonic well-being. The coefficient of the severe disability dummy is smaller in absolute value in the Meaning of Life regression, but still negative and significant.

Table E7 Stratification by degree of limitation (Meaning of Life)

	All disabled		**Moderately disabled**		**Severely disabled**	
	Coefficient	*S.E.*	*Coefficient*	*S.E.*	*Coefficient*	*S.E.*
Constant	-3.500^{+}	(2.13)	-0.399	(2.35)	-7.823^{+}	(4.34)
Accessibility	12.39***	(3.00)	8.415*	(3.30)	16.88**	(6.15)
Severely disabled	-0.622***	(0.04)				
Woman	0.280***	(0.04)	0.251***	(0.04)	0.328***	(0.08)
Migrant	-0.150^{+}	(0.08)	-0.289**	(0.10)	0.203	(0.16)
Partner	0.534***	(0.04)	0.526***	(0.05)	0.529***	(0.09)
Dependent children	0.192***	(0.04)	0.173***	(0.05)	0.244**	(0.09)
Age						
16-34	0.0637	(0.07)	0.0397	(0.07)	0.0913	(0.15)
55-64	0.481***	(0.04)	0.383***	(0.05)	0.629***	(0.09)
Education						
Low education	-0.190***	(0.05)	-0.213***	(0.05)	-0.155^{+}	(0.09)
High education	0.137**	(0.05)	0.139**	(0.05)	0.151	(0.11)
Working status						
Employed	0.863***	(0.07)	0.764***	(0.08)	1.154***	(0.15)
Student	0.852***	(0.16)	0.794***	(0.17)	0.953**	(0.37)
NEET	0.340***	(0.07)	0.396***	(0.08)	0.324*	(0.15)
Household income						
2nd income quartile	0.245*	(0.10)	0.211^{+}	(0.12)	0.379^{+}	(0.21)
3rd income quartile	0.578***	(0.12)	0.485***	(0.13)	0.804***	(0.23)
4th income quartile	0.747***	(0.12)	0.619***	(0.14)	1.037***	(0.25)
Country dummies	Yes		Yes		Yes	
N	38452		27657		10795	
Adj. R2	0.118		0.086		0.097	

Data is weighted. Heteroscedasticity robust standard errors in parentheses. Statistical significance: $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$. Base categories (not displayed) are: 35-54, nondisabled, single, medium education, unemployed, 1st income quartile.

As for accessibility, the associated coefficient equals 8.415 among respondents with moderate limitations and more than twice that among moderately disabled people. When eudaimonic well-being is considered, the coefficients associated with every single income quartile dummy in the regression including respondents with moderate limitations are smaller than the corresponding coefficients in the regression restricted to disabled people with severe limitations.

There is no way to test whether these differences are statistically significant. However, if they were,

that would imply that severely disabled people have a greater need not only for environmental accessibility, but also for specialized (and thus costly) goods and services.

Discussion Papers
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