CSIS Discussion Paper No. 107

Spatial Mismatch of Childcare in Tokyo*

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January, 2011

Abstract

By extending Kain's traditional spatial mismatch theory, this paper examines childcare centers' spatial mismatch problem—a geographic mismatch that impedes a balance between work and childrearing. The study area is Tokyo, which has a large and growing number of children on childcare waiting lists. Survey results indicate the importance of spatial proximity and access to childcare centers in achieving the desired balance between work and childrearing. Visualized accessibility shows a considerable geographic mismatch between the supply and demand of childcare centers, especially for smaller children aged 0–2 years. Resolving the spatial mismatch problem can be a key policy.

* This work was supported by the Grants-in-Aid for Scientific Research [20330045, 22510140] from the Japan Society for the Promotion of Science. The author is grateful to the Bureau of Social Welfare and Public Health of the Tokyo Metropolitan Government, local municipalities, and individual childcare centers for the valuable childcare data they provided for this study.
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1. Introduction

As a growing number of women participate in the labor market, improving the balance between work and family has become an important policy objective in many countries. The lack of childcare services is often reported as a problem affecting this balance (OECD, 2007). This problem is especially serious in Japan, which has a large number of children on waiting lists for licensed daycare centers. Childcare queues arise owing to not only the lack of supply but also the geographic mismatch between supply and demand. Even when a childcare slot is available, it would remain inaccessible unless the center is located within a reasonable distance. Little attention, however, has been paid to the *accessibility* of childcare centers within a reasonable distance. There may be a considerable geographic mismatch with accessible childcare centers, and the lack of accessible childcare may be a significant hindrance to attaining a desired balance between work and childrearing.

In this discussion, I extend Kain's (1968) well-known spatial mismatch theory that a geographic mismatch between jobs and workers, which has arisen from job suburbanization and housing segregation, has reduced job opportunities and increased unemployment among African-Americans in the inner cities. The spatial mismatch has drawn considerable attention, and numerous studies have examined it; for comprehensive reviews on the spatial mismatch literature, see Holzer (1991), Ihlanfeldt and Sjoquist (1998), and Kain (1992), among others. In a narrow sense, Kain's spatial mismatch focuses on inner-city minorities, since it was first perceived as one of the possible reasons for growing urban poverty. In a broader sense, however, the concept of spatial mismatch is applicable to other situations involving access to opportunities and employment. In fact, a large number of studies use the spatial mismatch framework to examine the importance

of access to jobs in employment among various disadvantaged groups such as welfare recipients (Blumenberg, 2004; Bania et al., 2008), autoless workers (Taylor and Ong, 1995; Kawabata, 2003), and refugees (Åslund et al., 2010).

Given the spatial constraint of workers with small children, the concept of spatial mismatch is particularly relevant to childcare. However, the spatial mismatch problem affecting those who need childcare has never been sufficiently addressed. Therefore, this research attempts to examine the spatial mismatch of childcare, defining it as the geographic mismatch between the supply and demand of childcare centers that impedes a balance between work and childrearing. Specifically, the following two questions are addressed. First, is access to childcare centers important in achieving the desired balance between work and childrearing? Second, does a geographic mismatch exist between the supply and demand of childcare centers, and does it differ by age?

The study area comprises Tokyo's 23 special wards, which have a large number of children on childcare waiting lists. To answer the first question, a questionnaire survey was conducted among mothers with preschool children (children aged 0–5 years). As regards the second question, the accessibility of childcare centers, which indicates the geographic mismatch of their supply and demand was calculated and visualized for each age group. Accessibility is calculated at the block level—a micro area—with the help of detailed spatial data and a geographic information system (GIS). Age-wise differences are examined since childcare queues are known to differ considerably by age (MHLW, 2009). A simultaneous consideration of accessibility, taking into account not only the supply but also the demand competing for the supply, the fine-grained spatial unit, and age differentiation is a unique methodological feature in examining the geographic mismatch. In this study, I differentiate between geographic and spatial mismatch to avoid

confusion. The former indicates a purely locational mismatch, but the latter implies that the geographic mismatch hinders a desired balance between work and childrearing. In the subsequent sections, the article reviews related literature, describes the methods, reports the results, and discusses the findings.

2. Related literature

Studies suggest that access to childcare involves severe space and time constraints (Miyazawa 1998; Kwan 1999). Nonetheless, the geographic mismatch of childcare centers has not been well examined in recent studies. Nor has the importance of access to childcare in achieving the desired balance between work and childrearing been researched, although some studies suggest that greater availability of childcare augments female labor force participation (Stolzenberg and Waite, 1984; Webster and White, 1997; Nakamura and Ueda, 1999; Gordon and Chase-Lansdale, 2001; Chevalier and Viitanen, 2002; Van Ham and Büchel, 2006).

The limited research may be attributed in part to the limitations of relevant data for the measurement of childcare accessibility. As in the case of access to jobs in Kain's traditional spatial mismatch, access to childcare is a central issue in the spatial mismatch of childcare. However, only a few studies have examined childcare accessibility using detailed data. Researchers often point out that the use of an appropriately small geographic unit is critical in examining job accessibility (Hanson et al., 1997; Shen, 2001). This approach is even more critical in examining childcare accessibility, since journeying to childcare involves greater spatial restraints. It is also important to take into account both the supply and demand, since incorporating either supply or demand only can distort childcare accessibility significantly. Further, age differentiation of children is

desirable, since the level of childcare services differs substantially by age.

Spatial details, supply and demand, and age have rarely been taken into account concurrently due to data limitations. For instance, most studies that measure childcare accessibility, often termed as childcare availability, use large geographic units such as counties or county groups (Stolzenberg and Waite, 1984; Davis and Connelly, 2005), prefectures (Nakamura and Ueda, 1999), and regions (Kreyenfeld and Hank, 2000;[1] Van Ham and Büchel, 2006). Studies that use smaller geographic units such as zip-code areas (Gordon and Chase-Lansdale, 2001) and circle areas with a radius 800 meters (Webster and White, 1997) do not differentiate age. Besides, the supply and demand of childcare and their geographic mismatch have not been adequately addressed. For example, Gordon and Chase-Lansdale (2001) measure childcare accessibility as the log of the inverse of the number of children aged 0–6 divided by the number of childcare workers by place of work. Webster and White (1997) measure childcare accessibility by the number of child-minders divided by the number of mothers with one or more children aged 0–4 years. Such measures can be improved by incorporating childcare capacity as the supply and the number of children who need childcare as the demand, which this study will demonstrate.

The spatial mismatch problem for those who need childcare is highly relevant to Kain's spatial mismatch concept, but very few pay attention to this connection. Van Ham and Büchel (2006) refer to Kain's spatial mismatch and examine the effects of spatial structures including job accessibility and childcare availability (at the regional level) on female labor force participation. Their discussion on spatial mismatch, however, centers on access to jobs rather than on access to childcare. Indeed, the notion

[1] They use *Kreis* in western Germany.

of spatial mismatch is missing in childcare research and policy. By extending Kain's well-regarded spatial mismatch theory, this study aims to shed light on the spatial mismatch problem for those who wish to balance between work and childrearing.

3. Methods

Tokyo's 23 special wards, generally regarded as the central area of Tokyo (Figure 1), cover 622 square kilometers and accommodated 8.5 million people in 2009. In the rest of the paper, this area will be referred to as the "Tokyo ward area," and "Tokyo" will indicate the whole metropolis. The methods employed comprise the following: (1) investigating the increase in demand for childcare centers, (2) understanding spatial distributions of preschool children and childcare centers, (3) analyzing the importance of access to childcare centers, and (4) examining the geographic mismatch between the supply and demand of childcare centers. Each of these steps will be described below.

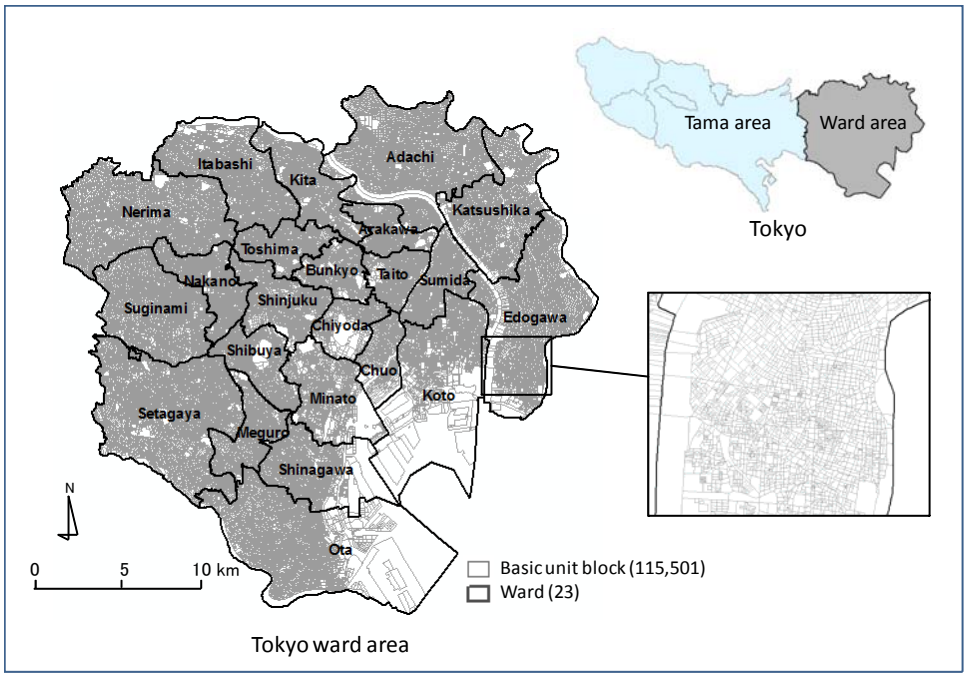

Figure 1. Study area.

First, the increase in the demand for childcare centers is investigated on the basis of the number of applicants and children, by age, on waiting lists for licensed daycare centers from 2004 to 2009. These data were obtained from the Tokyo Metropolitan Government (TMG) Bureau of Social Welfare and Public Health. Note that the numbers are available only for licensed daycare centers, in which contracts are made through local municipalities. The corresponding data for other types of childcare centers, in which direct contracts are made between childcare centers and users, are not available.

Second, the spatial distributions of preschool children and childcare centers in 2009 are investigated. I estimated the number of preschool children by age for each basic unit block (*kihontaniku*), the smallest geographic unit for which census data are available. This estimation was necessary because the smallest geographic unit for which preschool population data by age are available for 2009 is a subdivision (*chocho-aza*) of a city, larger in area than the basic unit block. According to the geographical information in the 2005 census, there are 3,139 subdivisions and 115,501 basic unit blocks within the Tokyo ward area. The median areas of the subdivisions and basic unit blocks in the Tokyo ward area are 172,125 and 3,456 square meters, respectively. I collected data—the number of preschool children in the subdivisions, categorized by age—for the year 2009 from each of the 23 ward offices and disaggregated the data by basic unit block. For this purpose, I applied a proration factor based on the 2005 census population data provided by the Statistics Bureau of the Ministry of Internal Affairs and Communications (MIC), Japan. This study was based on three types of childcare centers: licensed daycare centers (*Ninka-hoikujo*), TMG-certified daycare centers (*Tokyo's ninsyo-hoikujo*), and authorized childcare centers (*Nintei-kodomoen*). These centers were selected for the study because they are obligated to meet the national or TMG standards; and hence their quality is

ensured at a certain level. In addition, their costs are regulated so that their maximum monthly fees are set at about $800.[2] Each type of the three centers is briefly described below.

- *Licensed daycare centers* are established under the Child Welfare Law. The centers are the major and most popular childcare service providers. The centers comply with national minimum standards in terms of building size, playground size, number of nurses, childcare content, childcare hours, and so forth. A part of their operating expenses are paid out of public funds from national, metropolitan, and city governments as well as other sources. Childcare fees are determined by the local municipality according to each family's income and the age of the child, from no fees at all to about $800 per month. Applications for enrollment are submitted to each local municipality (ward in Tokyo).

- *TMG-certified daycare centers* are designed to meet the diverse needs of urban areas that would be difficult for licensed daycare centers to provide. TMG-certified daycare centers are obligated to accept children under the age of 1 year and operate for 13 or more hours per day. Some standards are comparable with those of licensed daycare centers (e.g., the number of nurses per child), but others are relaxed (e.g., a playground is not required). The TMG and local municipalities subsidize portions of the operating expenses. Childcare fees are determined by the individual centers, but

[2] Quality and cost are often major concerns in countries, such as the US, where childcare services are provided in the private sector (Blau and Robins, 1988; Blau, 2001), but availability seems to be more of an issue in countries where most childcare services are publicly subsidized—such as Germany, Japan, and Sweden (Kreyenfeld and Hank 2000; Del Boca and Vuri, 2007).

an upper limit applies—approximately $800 per month. Guardians contract the centers directly.

- *Authorized childcare centers* are established under the Law Concerning Promotion of the General Provision of Education and Childcare to Preschool Children, enacted in October 2007. The centers combine childcare with kindergarten functions. Individual childcare centers determine their fees independently but must report the amount to the local municipality. If the fee is inappropriately high, the local municipality can order the center to lower it.

The TMG Bureau of Social Welfare and Public Health (2009) provides more detailed information on available childcare centers. Spatial points of the locations of the three types of childcare centers were created using the detailed address matching service provided by the Center for Spatial Information Science at the University of Tokyo. The estimated numbers of preschool children at the level of the basic unit block as well as the spatial points of childcare centers were then visualized using a GIS to investigate their spatial distributions.

Third, the importance of access to childcare is analyzed. To do so, I commissioned Nikkei Research Inc. for an Internet-based questionnaire survey. The survey was carried out in 2009, between November 20 to 25, among 650 mothers with preschool children living in the Tokyo ward area; 311 mothers responded to the questionnaire. The survey sample is widely distributed across the 23 wards. The participants were not selected at random, but their basic demographic statistics are not very different from the 2005 census data (see Table A1 in the appendix). Mothers are selected because they are most likely the

primary carers in households and probably face more space-time constraints than men (Kwan, 1999). Further details about the survey are documented in Kawabata (2010).

Fourth, I develop a measure of the accessibility of childcare centers to examine the geographic mismatch between their supply and demand. Accessibility is calculated for each age and basic unit block. The accessibility for a resident block i (A_i) is calculated with the following equation:

$$A_i^a = \sum_{j:d_{ij}<d_0} \frac{S_j^a}{\sum_{k:d_{kj}<d_0} r^a P_k^a}, \qquad (1)$$

where a is the age of children; S_j the supply of a childcare center j; d_{ij} and d_{kj} the respective distances by road between resident blocks i and k, on the one hand, and a childcare center j, on the other; d_0 the threshold distance for commuting to childcare centers; r the ratio of those requiring childcare centers to the whole population; and P_k the population in a resident block k.

The accessibility value obtained from equation (1) represents the supply-demand ratio of childcare centers that incorporates spatial competition. For details on the treatment of spatial competition in accessibility measurements, see Harris (2001). The point here is that the accessibility takes into account not only the spatially accessible supply but also the demand spatially accessible (spatially competing) to the supply. An accessibility value of 1 represents a supply-demand balance, whereas a value greater or less than 1 indicates excess supply or demand. Note that the population-weighted value of accessibility calculated for each basic unit block equals the supply-demand ratio of childcare centers for the whole area (the Tokyo ward area). An advantage of the measure is that it can be readily interpreted and allows comparison among different areas. However, it does not take into account the supply and demand outside the study area,

which may distort the supply-demand ratio, especially around the border of the study area. This is unlikely to be a major problem in this study because licensed and TMG-certified daycare centers (which together account for 99% of the total capacity of the three types of childcare centers) prioritize applicants living in the same ward and in Tokyo, respectively.

Spatial data on basic unit blocks based on the 2005 census were obtained from the Statistical Bureau of MIC, Japan. As for the supply of childcare centers (S_j), I used the three types of childcare centers' capacity as of April 2009. The distance by road between a basic unit block and a childcare center (d_{ij} and d_{kj}) is calculated using the 2009 road network data and ArcGIS9.3 of ESRI Japan, Inc. Here, the location of a basic unit block is the centroid of that block, and the location of a childcare center is the spatial point created as described earlier. The ratio of the population requiring the three types of childcare centers (r) is set at 20% for 0-year-olds and 35% for children aged 1 year and older.[3] The population (P_k) used is the population estimated by basic unit block as explained earlier. As regards the threshold distance to childcare centers (d_0), I used 500, 750, and 1,000 meters; Pinch (1984) and Webster and White (1997) use half a mile, or about 800 meters,

[3] With the available data, I estimated the ratio of those requiring the three types of childcare centers to the population (r) in the Tokyo ward area in 2009, using the following equation:

$$r^a = (S_l^a + S_{ta}^a + Q_l^a - E_{ta}^a) / P^a, \qquad (2)$$

where a denotes age, S_l the number of children enrolled in licensed daycare centers, S_{ta} the capacity of TMG-certified and authorized childcare centers, Q_l the number of children on licensed-daycare waiting lists (based on the old definition that calculates the number as the number of applicants for licensed daycare centers minus the number of applicants admitted), E_{ta} the number of children in Q_l but enrolled in TMG-certified or authorized childcare centers, P the population. The estimated ratios are 17% (for age 0), 34% (1 year), 37% (2 and 3 years), and 35% (4 and 5 years). Note that the numbers of children enrolled in TMG-certified and authorized childcare centers by age were not available. Since many TMG-certified daycare centers accept more children than their capacity would allow for, equation (2) is unlikely to overestimate the ratios.

as the threshold. Assuming a walking speed of about 50 meters per minute, with small children in tow, as in Segawa and Sadahiro (1996), the three thresholds are approximately 10, 15, and 20 minutes on foot, respectively. According to Miyazawa (1998), the actual and preferable travel time to and from childcare centers is about 10 minutes or less. In this study, walking is assumed. In the Tokyo ward area, although the most common means of commuting to childcare centers tends to be bicycles on a regular day, users tend to walk on a bad-weather day (Kawabata, 2010). Many childcare centers in the Tokyo ward area discourage the use of cars.

4. Results

4.1 Increase in demand for childcare centers

The numbers of applicants for licensed childcare centers between 2004 and 2009 clearly depict the rising demand for childcare (Figure 2). During this 5-year period, the total number of applicants increased by 76% (from 40,492 to 71,443), with a noticeable rise between 2008 and 2009. Further investigation indicates that during the same period the preschool population increased, as did the ratio of the number of licensed-childcare applicants to the preschool population. The preschool population in the Tokyo ward area grew by 2.7% (from 377,110 to 387,169), and the ratio of applicants in Tokyo increased from 28.2% to 30.9%, the greatest upswing occurring between 2008 and 2009–from 29.7% to 30.9% (TMG, 2009).

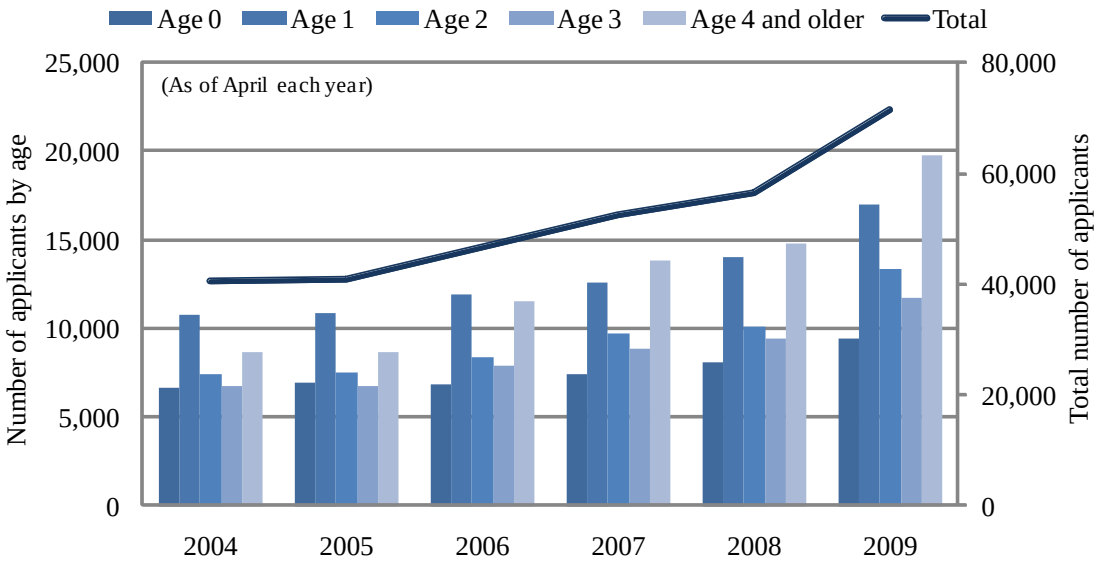

Figure 2. Number of applicants for licensed daycare centers in Tokyo ward area, 2004–2009.

The number of children on licensed-daycare waiting lists from 2004 to 2009 indicates a growing mismatch between supply and demand (Figure 3). During this 5-year period, the total number of children on waiting lists rose by 79% (from 2,583 to 4,613), the 2008–2009 period showing a remarkable increase. Supply of childcare increased during the same period, but demand grew faster. In fact, the growth in demand related to smaller children aged 0–2 years. Between 2004 and 2009, waiting lists for children ages 0, 1, and 2 grew by 225%, 163%, and 48%, respectively, whereas the number on the lists decreased by 44% for age 3 and 62% for ages 4 and above. Thus, the proportion of 0- to 2-year-olds on waiting lists rose from 73% to 92%. In 2009, the 1-year-olds were predominant, accounting for about half the total number on waiting lists. The higher demand for childcare for smaller children may reflect the increases in the numbers of

childcare leaves[4] and mothers who wish to continue working for financial or other reasons.

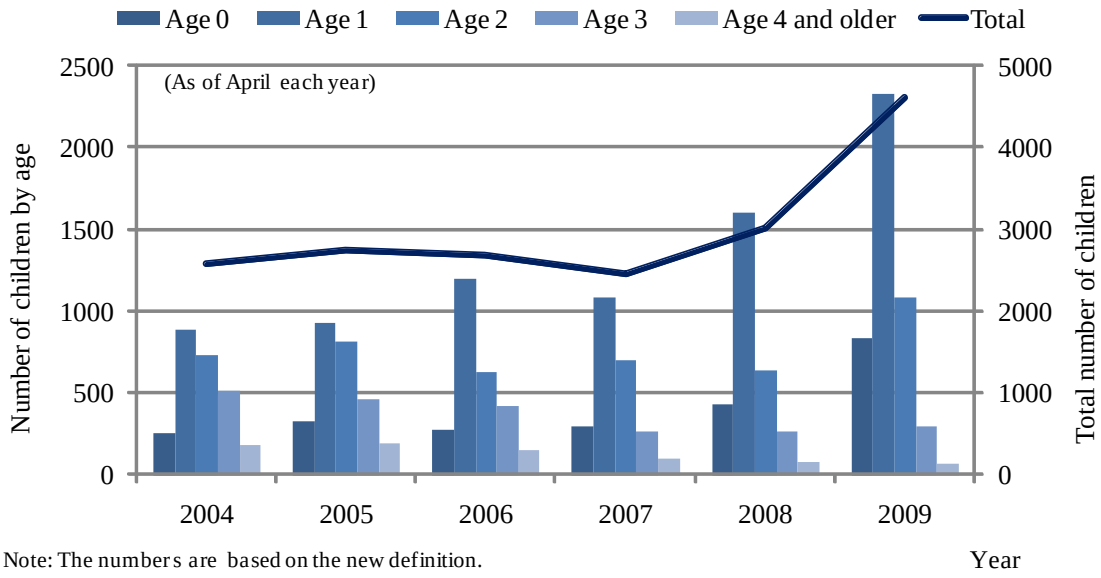

Figure 3. Number of children on waiting lists for licensed daycare centers in Tokyo ward area, 2004–2009.

It should be noted that the actual demand for childcare centers would be much greater than the publicly announced numbers in Figure 3 because of the following reasons. First, waiting-list data are announced only for licensed daycare centers. As explained in Section 2, the relevant figures for other center types are not included. Second, the publicly announced numbers do not include licensed-daycare applicants enrolled in non-licensed centers supported by public entities and those who indicated a single licensed daycare center (i.e., single as opposed to multiple selection) in their application forms as the desired facility. These adjustments were carried out since the definition of number of

[4] In Japan, by law childcare leave is allowed until a child is 1 year old but can be extended for half a year more if the child is awaiting enrollment in a childcare center.

children on licensed-daycare waiting lists was revised in 2002. The old definition did not require such subtractions (i.e., the number of children on the waiting list was simply the number of applicants for licensed daycare centers minus the number of those admitted). Since many users of non-licensed daycare centers apply for licensed daycare centers, the publicly announced number on waiting lists underestimate demand from the perspective of users. Third, the number of children on licensed-daycare waiting lists announced is usually as of April, when it tends to be the lowest. Since most licensed-daycare enrollments take place at the start of the fiscal year, the waiting lists tend to grow towards the end of the fiscal year, especially for children aged 0–2. From April to October 2004, for example, the number of children on Tokyo's waiting lists for 0-, 1-, and 2-year-olds increased 5.0, 1.4, and 1.5 times, respectively (TMG Bureau of Social Welfare and Public Health, 2005). Finally, many people do not apply because of the difficulty in enrolling in licensed daycare centers. Licensed daycare centers set rigorous selection standards, prioritizing full-time over part-time workers and job seekers, for instance. As Zhou and Oishi (2005) suggest, the potential demand that does not figure in the publicly announced data might be enormous, especially for smaller children. Indeed, a report by the Price Policy Division, Social Policy Bureau, Cabinet Office, Government of Japan (2003, figure 13-2 and table 13-2) estimated the potential demand for childcare in Tokyo at approximately 72,000.

4.2 Spatial distributions of preschool children and childcare centers

Figure 4 illustrates the spatial distribution of preschool children in 2009. Preschool children are widely distributed in the Tokyo ward area, except for nonresidential areas such as rivers and parks.

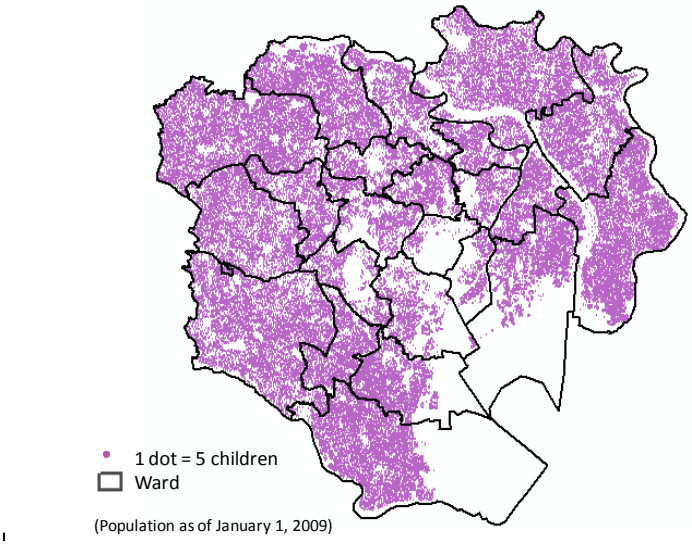

Figure 4. Spatial distribution of preschool children in Tokyo ward area, 2009.

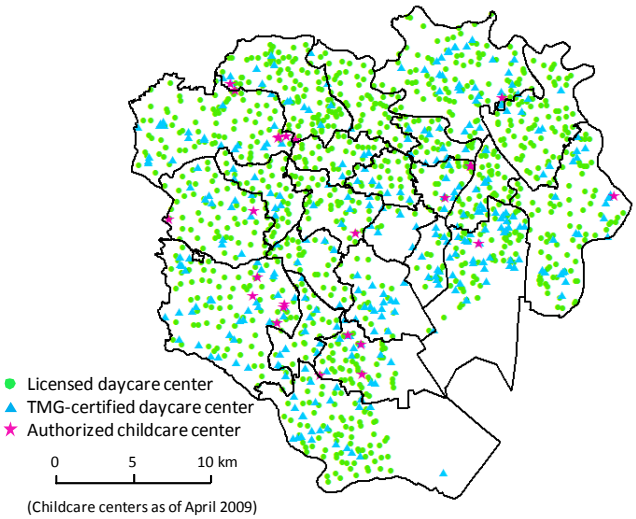

Figure 5. Spatial distribution of childcare centers in Tokyo ward area, 2009

Figure 5 depicts the spatial distribution of childcare centers in 2009.[5] Childcare centers are also widely distributed in the Tokyo ward area. Note that the dots in the figure indicate the locations of 1,477 childcare centers. Table 1 shows the numbers and capacities of childcare centers categorized by age. Both numbers and capacities are considerably smaller for the 0-year-old group than for others. The capacity of licensed

[5] A TMG-certified daycare center at the southern part of Ota Ward is located in Haneda airport.

centers for younger children aged 0–2 years is lower than that for 3- to 5-year-olds, and is particularly low for 0-year-olds. The capacity of TMG-certified centers, on the other hand, is relatively larger for younger children aged 0–2 years. Given that licensed centers are predominantly popular (Kawabata, 2010), this result suggests that TMG-certified centers play a key role in reducing the numbers of children on licensed-daycare waiting lists. Indeed, statistics provided by the TMG Bureau of Social Welfare and Public Health indicate that, as of April 2009, 24% of children on licensed-daycare waiting lists were accommodated by TMG-certified daycare centers in the Tokyo ward area. Authorized childcare centers, especially for younger children aged 0–2 years, are relatively small in both number and capacity.

Table 1. Number and capacity of childcare centers in Tokyo ward area, 2009

	Age of children					
	0	1	2	3	4–5	Total
Number of centers						
Licensed daycare center	792	1,118	1,117	1,083	1,072	1,129
TMG-certified daycare center	324	324	315	220	190	324
Authorized childcare center	9	11	12	20	20	24
Total	1,125	1,453	1,444	1,323	1,282	1,477
Capacity						
Licensed daycare center	8,062	15,906	19,220	21,475	44,298	108,961
TMG-certified daycare center	2,006	2,563	2,485	1,157	966	9,177
Authorized childcare center	90	123	171	322	621	1,327
Total	10,158	18,592	21,876	22,954	45,885	119,465

Note: The number of centers is based on locations as of April 2009. If a center has two different locations (e.g., central facility and branch facility on different locations), the number of centers is counted as two. The data for authorized childcare centers related to those who lack home care.

4.3 Importance of access to childcare centers

The first research question raised in this study is whether access to childcare centers

is important in achieving a balance between work and childrearing. The following survey results indicate that access to childcare centers is indeed important, and that a lack of access can impede this balance.

First, I show results depicting the importance of spatial proximity to childcare centers from home (Figures 6 and 7). Of the respondents who wish to use childcare centers, almost all (96%) answer that proximity from home is "very important" (79%, the predominant group) or "important" (17%). As for proximity from the workplace, on the other hand, approximately half (52%) considered it "very important" (23%) or "important" (30%), but 28% considered it "not very important" (19%) or "not important at all" (8%). (Note that the percentages have been rounded off.) This result suggests that proximity from home, rather than workplace, tends to be a prime consideration in selecting childcare centers. In fact, Hashimoto et al. (2010) find that users select childcare centers at workplaces primarily because they cannot be accommodated by centers near home. Respondents' one-way commute times to childcare centers confirm the importance of spatial proximity from home (Figure 7). Most users (77%) select centers that can be accessed within approximately 10 minutes, and almost all (98%) are serviced by centers accessible in about 20 minutes. These results suggest that long access times to childcare centers are not feasible.

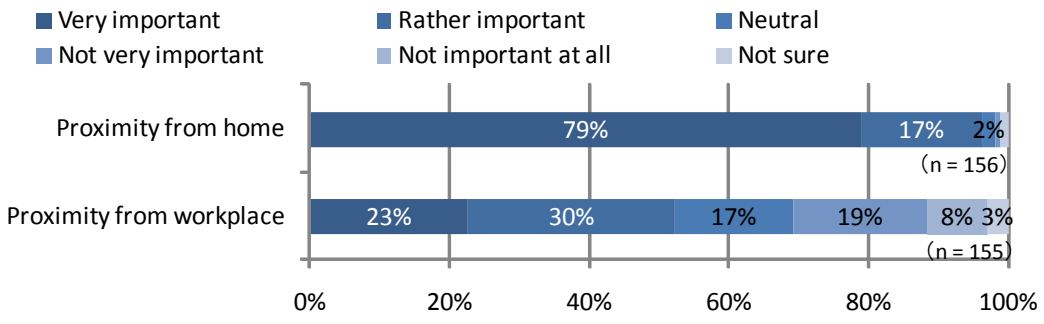

Figure 6. Importance of spatial proximity to childcare centers from home and workplace.

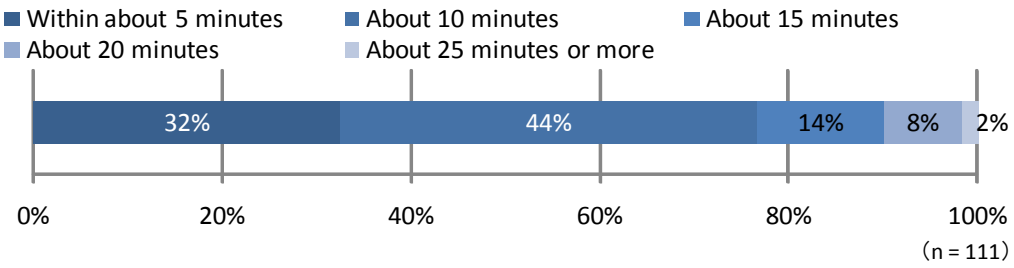

Figure 7. One-way commute time to childcare centers.

Next, I present results that illustrate the importance of access to childcare centers in balancing work and childrearing. The current as well as desired employment statuses show remarkable discrepancies (Figure 8). The majority (57%) of respondents are housewives, but most (87%) wish to work. The stated preference might exaggerate the desire to work, but the considerable gap is noteworthy. As for the desired employment status, the "non-regular employee" (42%) tends to be preferred to the "regular employee" (36%), and the "part-time employee" (55%) to the "full-time employee" (23%). Table 2 shows why respondents whose current and desired employment statuses were different could not realize the desired statuses. Among the reasons indicated, "domestic duties and childcare" constitute the largest share (78%), and "impossibility or difficulty to use childcare centers" accounts for a notable proportion (26%). Further, "impossibility to receive sufficient childcare services" and "impossibility or difficulty to use childcare for sick children" are also notable reasons, accounting for 18% and 14%, respectively. The experiences with balancing work and childrearing during the waiting period for enrollment in desired childcare centers are shown in Figure 9 and Table 3. About 71% answer that balancing work and childrearing became "very difficult/unstable" (41%) or "difficult/unstable" (30%) during the waiting period. In fact, 27% were forced to quit their jobs, and 1% were fired. Since these two choices do not overlap, 28% were

constrained to leave their jobs although they wished to continue working.

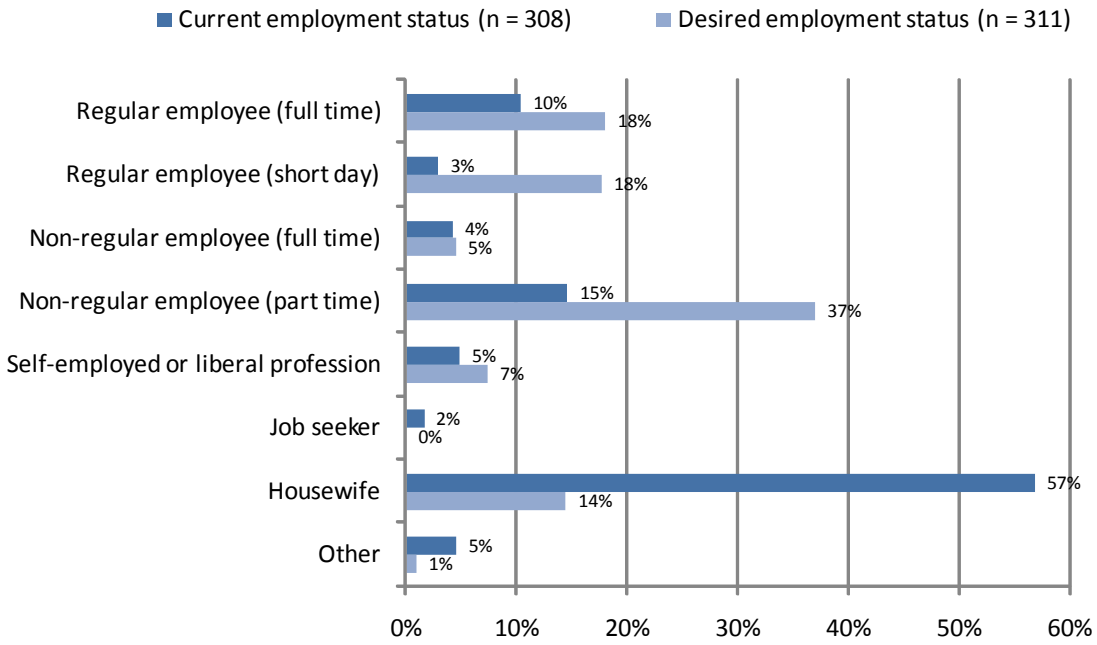

Figure 8. Current and desired employment status.

Table 2. Reasons for not being able to attain desired employment status

Reason	Percentage
Domestic duties and childcare	78
Lack of jobs with desired work and time schedules	30
Impossibility or difficulty to use childcare centers	26
Impossible or difficult to work during office hours	25
Lack of physical endurance	20
Lack of or difficulty to obtain cooperation from spouse or partner	19
Impossibility to receive sufficient childcare services	17
Lack of institutional support and understanding in the society	14
Impossibility or difficulty to use childcare for sick children	14
Children's disease	13
Lack of institutional support and understanding at workplace	10
Spouse or partner does not want	6
Care	1
Other reasons	4

(Multiple choice allowed; n = 269)

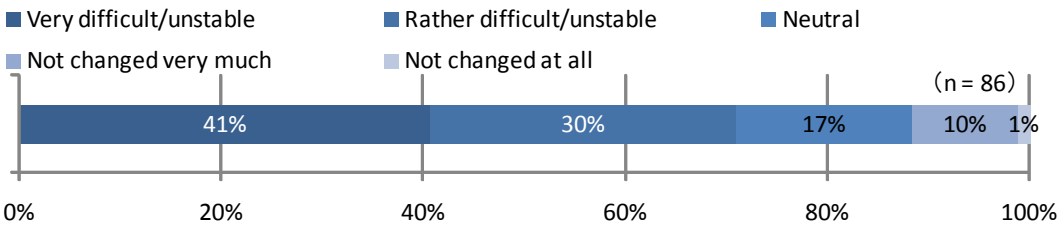

Figure 9. Experiences with balancing work and child-rearing during the waiting list period for desired childcare centers.

Table 3. Work-life experiences during the waiting list period for desired childcare centers

Condition	Percentage
Quit job despite desire to continue working	27
Used non-licensed daycare center other than the desired center	22
Worked while grandparents cared for a child or children	20
Adjusted duration of childcare leave in order to enter desired childcare centers	16
Used childcare service of other-than-desired childcare centers (e.g., baby-sitters)	15
Used licensed daycare center other than the desired center	14
Quit job willingly	8
Worked while spouse or partner cared for a child or children	4
Fired	1
Moved in order to enter desired childcare center	1
Worked while acquaintance/friend cared for a child or children	1
Other reasons	7

(Multiple choice allowed; n = 85)

4.4 Geographic mismatch between supply and demand of childcare centers

The second research question addressed in this study is whether there is a geographic mismatch between the supply and demand of childcare centers and whether the mismatch differs by age. The maps in Figure 10 provide a visualization of the accessibility of childcare centers by basic unit block for the commuting threshold of 750 meters. Since accessibility basically represents the supply-demand balance, an accessibility value of 1 or greater indicates excess supply, whereas a value of less than 1 indicates excess demand,

or a supply shortage. The maps uncover considerable geographic mismatch in the supply and demand of childcare centers. It is striking that many blocks have low values below 1, particularly for smaller children aged 0–2 years. In general, blocks with low accessibility show the following three patterns. First, no childcare centers exist nearby (within the commuting threshold). Second, centers nearby do not provide care for a particular age group. Third, demand exceeds supply for a particular age group, although centers nearby do provide care for that age group.

The considerable geographic mismatch of childcare centers might be a factor contributing to the large number of children awaiting enrollment in childcare centers. The number and extent of blocks with low accessibility were greater for smaller children aged 0–2 years than those aged 3–5 years. This is consistent with the greater number of smaller children on waiting lists. Although a geographic mismatch was indicated in a number of blocks for children 3 to 5 years old, the number on the waiting lists was relatively small (see Figure 3). This result may be due to the fact that children 3 years and older can be accommodated in kindergartens.

The sensitivity to alternative commuting thresholds was examined. Two alternative commuting thresholds of 500 and 1,000 meters were used to calculate the accessibility of childcare centers, and the results were compared to the data in Figure 10. When the 500-meter threshold was used, the number of blocks with considerably low accessibility values below 0.25 increased substantially, especially for the 0-year-olds, for whom childcare help is limited. This result occurred because many blocks do not have childcare centers within the 500-meter threshold. When the 1,000-meter threshold was used, on the other hand, the number of blocks with considerably low accessibility decreased, because

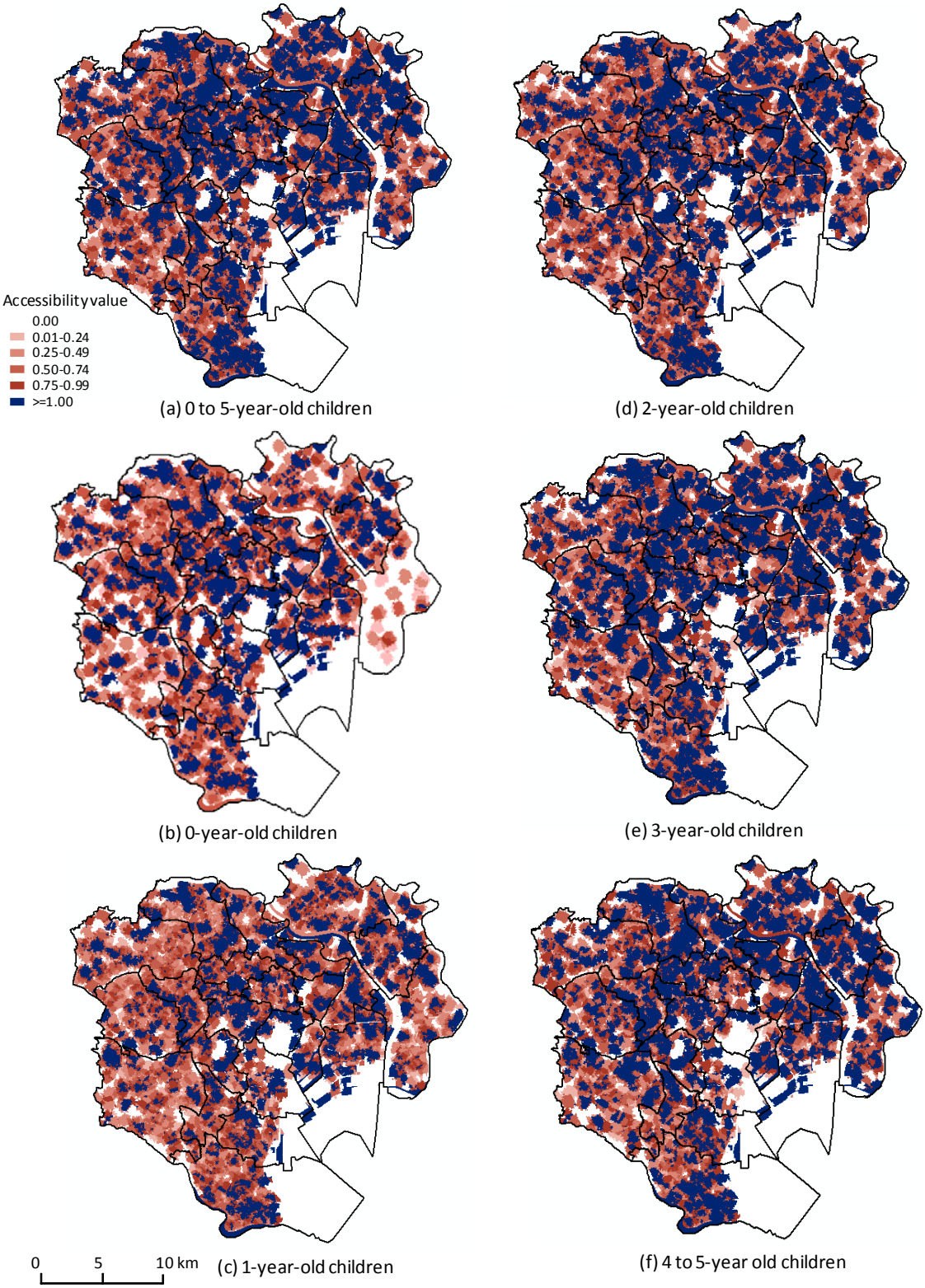

Figure 10. Accessibility of childcare centers in Tokyo ward area (commuting threshold of 750 m), 2009.

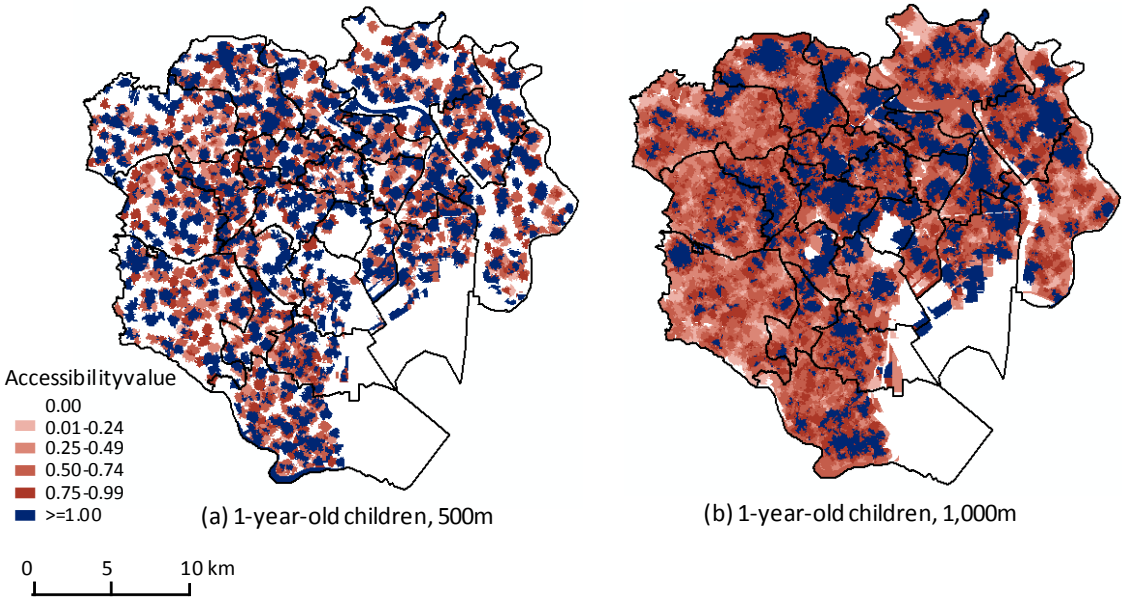

Figure 11. Accessibility of childcare centers in Tokyo ward area, 2009.

many blocks have childcare centers within 1,000 meters. The alternative thresholds led to different spatial variations in accessibility, but the finding that accessibility is below 1 in many blocks was consistent. (Figure 11 shows the accessibility for 1-year-old children based on the 500- and 1,000-meter thresholds.)

5. Conclusion

Extending the traditional concept of spatial mismatch, this study examined the spatial mismatch of childcare—the geographic mismatch that impedes the balancing of work and childrearing. The study was conducted for the Tokyo ward area, which has witnessed a remarkable growth in the number of children on childcare waiting lists. The survey results indicated the importance of spatial proximity and access to childcare centers in achieving the desired balance between work and childrearing. Visualized accessibility revealed a considerable geographic mismatch in the supply and demand of childcare centers, especially for smaller children aged 0–2 years. Taken together, the findings

demonstrated a spatial mismatch of childcare.

Three policy implications are drawn from the findings. First, redressing the spatial mismatch by improving the accessibility of childcare centers helps to balance work and childrearing, which in turn leads to female participation in the labor force. In a number of countries, most women work, but many leave their jobs when they have children. Such a trend is particularly visible in Japan, where the labor-force participation rate of mothers with preschool children is among the lowest in OECD countries. A striking finding was the considerable gap between the current and desired employment statuses among mothers of preschool children. A large proportion of mothers of preschool children were housewives but wished to work. One of the major reasons for this gap was the lack of adequate childcare services. This result suggests that if sufficient childcare services are provided, many mothers will be able to participate in the labor market more actively.

Second, improving the accessibility of childcare centers for smaller children will not only help reduce the number of children on waiting lists but also allow parents to continue working. Smaller children aged 0–2 years made up the largest number on childcare waiting lists; in fact, this number continues to increase, which reflects the growing desire among mothers to continue working while raising children. It is important for women to continue working in order to achieve secure employment, since discontinuity of employment often becomes a disadvantage for women who wish to reenter the labor market. The survey results suggest that, while their children are on childcare waiting lists, many mothers find it difficult to balance work and childrearing, and a sizable number of them leave their jobs much against their desire. To make matters worse, getting childcare help becomes even more difficult after losing one’s job, since

many centers prioritize full-time over part-time workers and job seekers. Without childcare services, mothers of small children would find it hard to search for jobs. Therefore, a lack of access to childcare can induce a negative spiral of being unable to use childcare centers and to get a job and keep it.

Third, resolving the geographic mismatch is a key approach to the development of childcare centers. Adequate childcare services help families achieve a balance between work and childrearing. However, where to locate childcare centers within a city and to what extent they should be developed are questions on which no clear policy exists. I propose accessibility as a useful indicator for the development of childcare centers. For example, developing childcare centers in low-accessibility areas (severe geographic mismatch) with high demand (large preschool population) would be an effective strategy to reduce waiting lists. Besides, this study's accessibility measure is useful in the following three ways. First, it can be applied to other areas and different periods with relevant commuting thresholds and supply and demand of childcare centers. Second, as accessibility basically represents a supply-demand balance, a comparison of accessibility between different areas and times is straightforward and readily understood. Third, accessibility visualized by a small geographic area is useful not only for childcare providers but also for childcare seekers in that it helps alleviate the problem of imperfect information on local childcare accessibility. In general, childcare center waiting lists (an indication of the availability of childcare) are open to the public only at the level of wards or larger administrative districts. As we have seen, however, accessibility of childcare centers varies considerably within a ward; supply exceeds demand in some areas, whereas demand exceeds supply in others.

The present study is, to the best of my knowledge, the first effort to explicitly extend

Kain's spatial mismatch theory to examine the spatial mismatch of childcare. This study is, however, limited to descriptive analysis. A statistical examination of the extent to which better access to childcare in spatially micro areas improves the balance between work and childrearing is a topic for further research.

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Appendix

Table 1A. Basic demographic statistics of the survey and 2005 census.

	Survey respondents		2005 census population of women with preschool children in Tokyo ward area	
	Number	Percent	Number	Percent
Age				
under 25	3	1	8,380	3
25–29	28	9	40,080	14
30–34	115	37	105,200	37
35–39	116	37	94,120	33
40–44	42	14	32,720	12
45 and older	7	2	3,700	1
Number of children living together				
1	145	47	138,170	49
2	142	46	113,740	40
3 and more	24	8	32,290	11
Age of youngest child				
0	57	18	58,560	21
1	66	21	57,820	20
2	58	19	49,330	17
3	59	19	44,700	16
4	34	11	38,250	13
5	37	12	35,540	13
Working	114	37 [a)]	96,260	34 [b)]
Housewives	175	57 [a)]	181,020	64 [b)]
Full sample size	311		284,200	

a) The proportions of those whose answers are valid (308). b) The proportions of those whose labor force statuses are determined (281,250).

Note: The census statistics were calculated using the order-made summary statistics provided by the National Statistics Center of Japan; the census statistics are different from the data created and made available by the administrative agencies.