THE HIERARCHY AND ATTRACTION AREAS OF THE EDUCATIONAL CENTERS OF THE SOUTHERN PART OF THE HUNGARIAN GREAT PLAIN

BY

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In the recent past many publications dealing with the southern part of the Great Hungarian Plain have appeared. These papers try to determine the attraction areas of this territory on the basis of one or more factors. A part of these papers are confined to the investigation of the attraction area of Szeged, (Gy. Krajkó and J. Tóth 1969; I. Pénzes and J. Tóth 1969, 1970, 1971; J. Tóth—Gy. Krajkó and I. Pénzes 1969; Gy. Krajkó and Gy. Abonyi 1969, I. Pénzes—J. Tóth—Gy. Abonyi 1969; Gy. Krajkó—I. Pénzes—J. Tóth 1970; I. Pénzes 1970; J. Tóth—I. Pénzes—Gy. Abonyi 1970; J. Tóth—I. Pénzes 1971; Gy. Krajkó—F. Móricz 1969), another part of them deal also with the determination of the attraction areas of the rest of the centers of the territory (J. Tóth 1966, 1969/a, 1969/b, 1970; D. Béla 1970.)

The aim of our Department is to carry out complex investigation of the attraction areas of the centers and to determine them, to investigate the hierarchical relations with the remoter aim of contributing to a reasonable determination of the economic area of the southern part of the Great Hungarian Plain and its microareas. (Gy. Krajkó, 1968). This complex task requires the investigation of a large number of details. Our study is a summary of the results of investigations concerning education.

I. Method

Starting from the fact that the general schools have but negligible territorial attraction, in the course of our investigations we considered only institutions of middle and higher education.

How many people of a settlement and where receive education at the level investigated cannot directly be determined by statistical methods. Thus we had to find an indirect approach to the data needed. At the beginning of the school-year 1969—70 we made a survey in all the important educational institutions of the area. The data supplied by the schools (number and place of origin of the pupils) constituted the basis of our analysis. Owing to the method of collecting them the data area also distorted along the borders of the examined area where also the attraction of centers not considered in this survey is noticeable. To express the intensity of attraction we use the number of pupils per 1.000 inhabitants. Because of the different ratios of pupils continuing their studies, this method cannot be applied throughout, but according to our experience it can well be used in the work of analyzing.

The educational institutions examined can be characterized by different degrees of attraction. On the basis of the ratio and territorial distribution of the rural students we distinguish institutions with little, medium, great, and nation-wide attraction respectively. We class the normal grammar schools among the schools with little attraction (I), the skilled worker training schools among those with medium attraction (II), the technical schools, special sections and special professional schools among those with great attraction (III), the middle schools for the nationalities, the higher technical schools. the teachers' training colleges and universities among those with nation-wide attraction (IV). The criteria used as a basis for this classification are of course influenced by the circumstance in which part of the examined area, in how large a settlement the institution in question is. Keeping the chief aim of the investigation in view, we disregarded the anomalies due to these circumstances.

II. Results

1. *General survey*

There are more than sixty thousand pupils in the 37 educational centers of the southern part of the Great Hungarian Plain. 56.4% of the pupils live away from the residence of the educational institution, or live there only temporarily (in dormitories or in rooms).

The number of educational centers is largest in the county of Békés (18), then follow Bács-Kiskun (11) and Csongrád (8) counties. In respect of the number of pupils the order is reversed, that is the educational function is the most concentrated in Csongrád county and the least concentrated in Békés county. (Table 1)

From the schools with little attraction to the institutions with nation-wide importance, the ratio of rural pupils grows in all three counties, but in different degrees. There is an essential difference between the counties also as regards the ratio of the types of schools with different degrees of attraction. The degree of concentration of the educational function, which is different in each county, scarcely influences the ratio of external attraction (Table 2).

As regards the individual centers, both the ratio of rural pupils (Fig. 1) and the number of the different types of schools (Fig 2) show great variation.

2. *Centers and their areas of attraction*

Separate maps corresponding to the four types of schools examined show differences in the extent of the areas of attraction of the different centers. In the case of institutions with little and medium attraction in the more manysided educational centers are not essential, and in the case of the less important centers they depend on whether these centers have such institutions or no. On the other hand there is a significant differ-
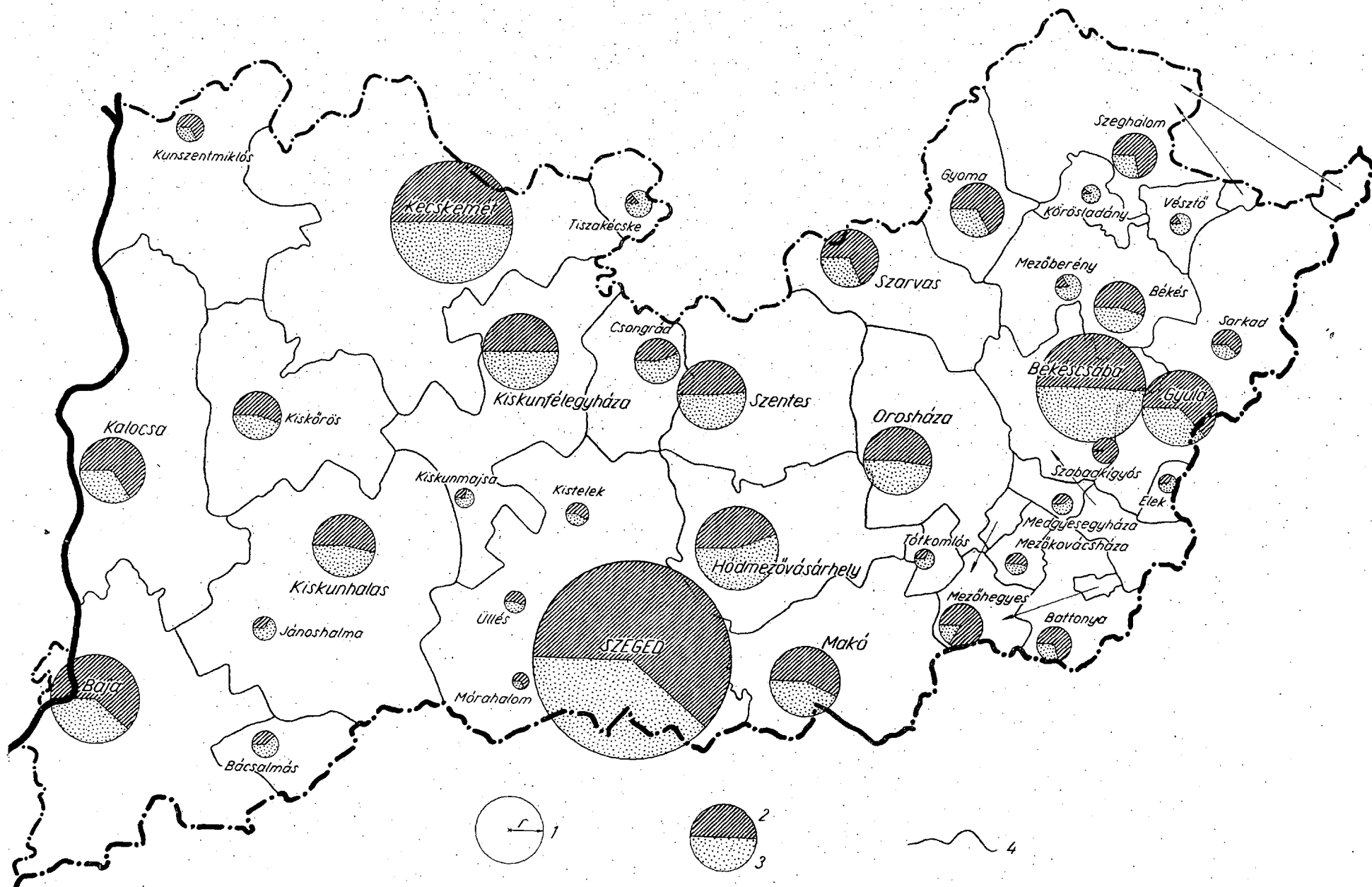
Kunszentmiklós

Kecskemét

Tiszakécske

Szeghalom

Gyoma

Körösladány

Vésztő

Szarvas

Mezőberény

Békés

Sarkad

Csongrád

Kiskunfélegyháza

Szentes

Orosháza

Békéscsaba

Gyula

Kalocsa

Kiskőrös

Kiskunmajsa

Kistelek

Szabadkígyós

Elek

Medgyesegyháza

Mezőkovácsháza

Tótkomlós

Kiskunhalas

Üllés

Hódmezővásárhely

Mezőhegyes

Battonya

Jánoshalma

Baja

Mórahalom

SZEGED

Makó

Bácsalmás

1 = r = 2,000 pupils

2 = ratio of rural pupils

3 = ratio of local pupils

4 = boundary line of attraction areas

Fig. 1. The attraction area of the institutions with little territorial influence (I, II) in the educational centers of the southern part of the Great Plain; the ratio of rural pupils studying in the educational centers.

Fig. 2. The attraction area of the institutions with great territorial influence (III, IV) in the educational centers of the southern part of the Great Plain; distribution of the pupils according to the types of schools with different territorial influence.

a = r = 2,000 pupils
b = ratio of pupils in schools with little attraction areas
c = ratio of pupils in schools with medium attraction areas
d = ratio of pupils in schools with large attraction areas
e = ratio of pupils in schools with nationwide attraction
f = boundary line of attraction areas

1. Szeged, 2. Kecskemét, 3. Baja, 4. Békéscsaba, 5. Kiskunhalas, 6. Kiskunfélegyháza, 7. Kalocsa, 8. Hódmezővásárhely, 9. Gyula, 10. Szentes, 11. Szabadkígyós, 12. Orosháza, 13. Szarvas.

TABLE 1.

The Average Size and Distribution of the Educational Centers of the Southern Part of the Great Plain

Type of school	Centers in Bács-Kiskun county		Centers in Békés county		Centers in Csongrád county		Centers of the southern part of the Great Plain	
	number of centers	average number of pupils	number of centers	average number of pupils	number of centers	average number of pupils	number of centers	average number of pupils
Little attraction (I)	11	468	16	439	8	697	35	505
Medium attraction (II)	7	1230	7	1054	5	1547	19	1249
Great attraction (III)	5	617	4	436	4	1054	13	696
Nationwide attraction (IV)	3	312	3	262	2	4095	8	1231
Total	11	1616	18	934	8	3215	37	1630

TABLE 2.

Total Data of the Educational Centers of the Southern Part of the Great Plain in the different counties (1969—1970)

Type of school	Bács-Kiskun county				Békés county				Csongrád county				Dél-Alföld			
	number of pupils	distribution %	number of rural pupils	ratio %	number of pupils	distribution %	number of rural pupils	ratio %	number of pupils	distribution %	number of rural pupils	ratio %	number of pupils	distribution %	number of rural	pupils ratio %
Little attraction (I)	5.151	29.0	2.261	43.9	6.961	41.4	2.987	42.9	5.575	21.7	1.824	32.7	17.687	29.3	7.072	40.0
Medium attraction (II)	8.609	48.4	4.419	51.3	7.379	43.9	4.791	64.9	7.737	30.1	3.749	48.4	23.725	39.4	12.959	54.6
Great attraction (III)	3.084	17.3	2.022	65.6	1.744	10.4	1.293	74.1	4.218	16.4	2.349	55.7	9.046	15.0	5.664	62.6
Nationwide attraction (IV)	936	5.3	842	89.9	726	4.3	649	89.4	8.189	31.8	6.798	83.0	9.851	16.3	8.289	84.1
Total	17.780	100.0	9.544	53.7	16.810	100.0	9.720	57.8	25.719	100.0	14.720	57.2	60.309	100.0	33.984	56.4

ence between the areas of attraction of institutions with medium and great attraction as well as between the areas of attraction of institutions with great and nation-wide attraction. In view of the fact, however, that the attraction of Szeged in category I V p r e v a i l s over the attraction of all other centers of the southern part of the Great Plain even in their immediate environs, and its prominents role from the point of view of educational function needs no proof, it is sufficient to differentiate the material of examination on the basis of the significant difference between the areas of attraction of institutions with medium and great attraction. Accordingly, the areas of attraction of the educational centers of the southern part of the Great Plain can be examined summarizing on the basis of the institutions with little and medium as well as great and nation-wide attraction.

a) *The areas of attraction of the educational centers on the basis of institutions with little and medium attraction*

The boundaries of the areas of attraction so differentiated show a certain agreement with the boundaries of the administrational districts in every case when the center of the district is a town or a settlement with the legal status of a village with important functions which in the settlement geographical sense can be considered a town. Szeged, Kecskemét, Baja, Kalocsa, Kiskunhalas, Kiskőrös, Kiskunfélegyháza, Makó, and Gyula have such areas of attraction. The villages in the western part of the district of Szentes gravitate to the town of Csongrád, and those in its southern part to the town of Hódmezővásárhely. In the southern part of the district of Orosháza the attraction of Tótkomlós, and the influence of Makó and Hódmezővásárhely are felt. In the territory of the district of Szarvas Gyoma is an independent center attracting Endrőd. Some villages of the district of Szeghalom gravitate to Gyula, others (Vésztő, Körösladány) are independent microcenters without areas of attraction. Three villages in the southern part of the district of Békés gravitate to Békéscsaba, yet even together with these the dominant influence of the center of the county is limited to a relatively small area. The southeastern part of the county of Békés, i. e. the district and region of Mezőkovácsháza is the divided area of attraction of several small centers, among which the mutually complementary roles of Mezőhegyes and Battonya (with industrial school and grammar school respectively) are the most important.

Of the other smaller centers not mentioned so far Kunszentmiklós has the largest area of attraction. On the other hand, the low ratio numbers of the villages suggest that this territory — a large part of the former district of Dunavecse — gravitates strongly also to such centers outside the boundaries of the examined territory as Budapest, Dunaújváros etc.

On the boundary of the area of attraction of Kiskunhalas and Baja, Bácsalmás has a relatively small but distinct area of attraction.

Some other centers — although with no area of attraction — distinguish themselves from the area of attraction of some larger centers (e. g.

Tiszakécske, Elek) others again themselves gravitate to some larger center (Jánoshalma, Kiskunmajsa, Mórahalom, Üllés, Kistelek, Mezőberény, Sarkad, and Szabadkígyós, which has only a special school. The now existing attraction of these smaller centers is completely covered by the more important centers.

The difference in order of magnitude of the educational centers at this level is reflected but little in the different dimensions of the areas of attraction. In the case of the largest centers, this difference is demonstrable in the relatively high number of pupils attracted from territories outside the area of attraction (Fig. 1)

b) *The areas of attraction of the educational centers on the basis of institutions with great and nationwide attraction*

Of the 37 educational centers of the southern part of the Great Plain only 14 have great or nationwide attraction. Two of these, Makó and Szabadkígyós, themselves gravitate to the areas of attraction of Szeged and Békéscsaba. The attraction of Gyula and Szarvas is shaded by more important centers; there is no area in the southern part of the Great Plain in which their influence would be dominant over that of other centers on the basis of the criteria examined.

In the case of Szarvas, which has a relatively large number of high -grade institutions, this circumstance can be explained by its peripheral location and the dispersed attraction of its special schools.

The situation of Kalocsa is also a peculiar one: although it gravitates to Baja, it has an attraction area of its own consisting of several villages in its immediate neighborhood and in the territory of the former district of Dunavecse, which presumably gravitates also to centers outside the southern part of the Great Plain.

The nine other centers have attraction areas of their own. The role of Szeged among them is dominant. Its unbroken area of attraction stretches westward beyond the boundaries of Csongrád county and eastward, shading Makó and its attraction area, it covers the southern part of Békés county and extends even north of Orosháza, wich is wedged in to the north-western part of Békés county. A few villages of the central and north-western parts of Bács-Kiskun county also gravitate toward Szeged.

The attraction areas of Békéscsaba, Baja, and Kecskemét are also considerable. All three extend their influence on areas that in respect of education on a lower level of specialization gravitate toward other centers. The central and northern parts of Békés county gravitate toward Békéscsaba; the northern part of Bács-Kiskun county gravitates toward Kecskemét and its south-western part toward Baja. Of the rest of the centers Szentes and Kiskunfélegyháza are relatively important; Kiskunhalas, Hódmezővásárhely, and Orosháza have smaller attraction areas (Fig. 2)

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c) *The hierarchy and mutual relations of the educational centers*

The largest educational center of the southern part of the Great Plain is Szeged. Its importance is nationwide and its area of attraction can be determined only through the simultaneous investigation of other large centers (Budapest, Debrecen, Pécs, etc.). With its 30 institutions and more than 17.000 students it rises far above the other centers of the southern part of the Great Plain. This is evident also on the basis of the ratios and criteria mentioned: the proportion of rural pupils is 60%, the educational self-containment of the town is, in comparison to the conditions in the southern part of the Great Plain, nearly 99%, the coefficient value of the standard hierarchy depending on the number and types of the educational institutions is high. (Table 3)

Besides the regional center three paracenters, Kecskemét, Békéscsaba and Baja stand out. On the basis of their average values all of them are distinct from the mesocenters; the variation of the data of the individual towns around the average is insignificant.

The number of the mesocenters is nine. The variation of their criteria examined may be significant separately, but altogether it is insignificant. Kiskunhalas, Kiskunfélegyháza, Kalocsa, Szentes, Hódmezővásárhely, Makó, Szarvas, Orosháza, and Gyula belong in this class.

Between the level of the mesocenters and that of the microcenters there are five subcenters: Kiskőrös, Csongrád, Szeghalom, Békés, Gyoma.

Nineteen microcenters constitute the basis of the hierarchy of the centers. The values of these are, with the exception of the ratio of rural pupils, the lowest.

TABLE 3.

The Hierarchy of the Educational Center of the Southern Part of the Great Plain

Centers	Number of centers	Average number of pupils	Average number of institutions	Average ratio of external attraction %	Average valve of selected self-containment %	Standard hierarchy coefficient	Selected hierarchy coefficient
Regionalcenter	1	17.396	30.0	61.1	98.8	2.77	5.06
Paracenter	3	5.019	10.33	52.8	87.3	2.53	1.05
Mesocenter	9	2.054	4.33	54.9	74.2	2.27	0.40
Subcenter	5	981	2.60	58.3	62.8	1.60	0.15
Microcenter	19	235	1.05	54.3	35.0	1.18	0.03

The centers are attracted to one another in a complex way. The attraction between them can be measured by the proportion of pupils of the individual centers attracted by other centers. The system of attractions is surveyed in our study in such a way that only the primary, secondary, and tertiary attractions are considered together with their relative powers. The picture so received reflects well the hierarchy of the centers and its details reveal many peculiar relations (Fig. 3)
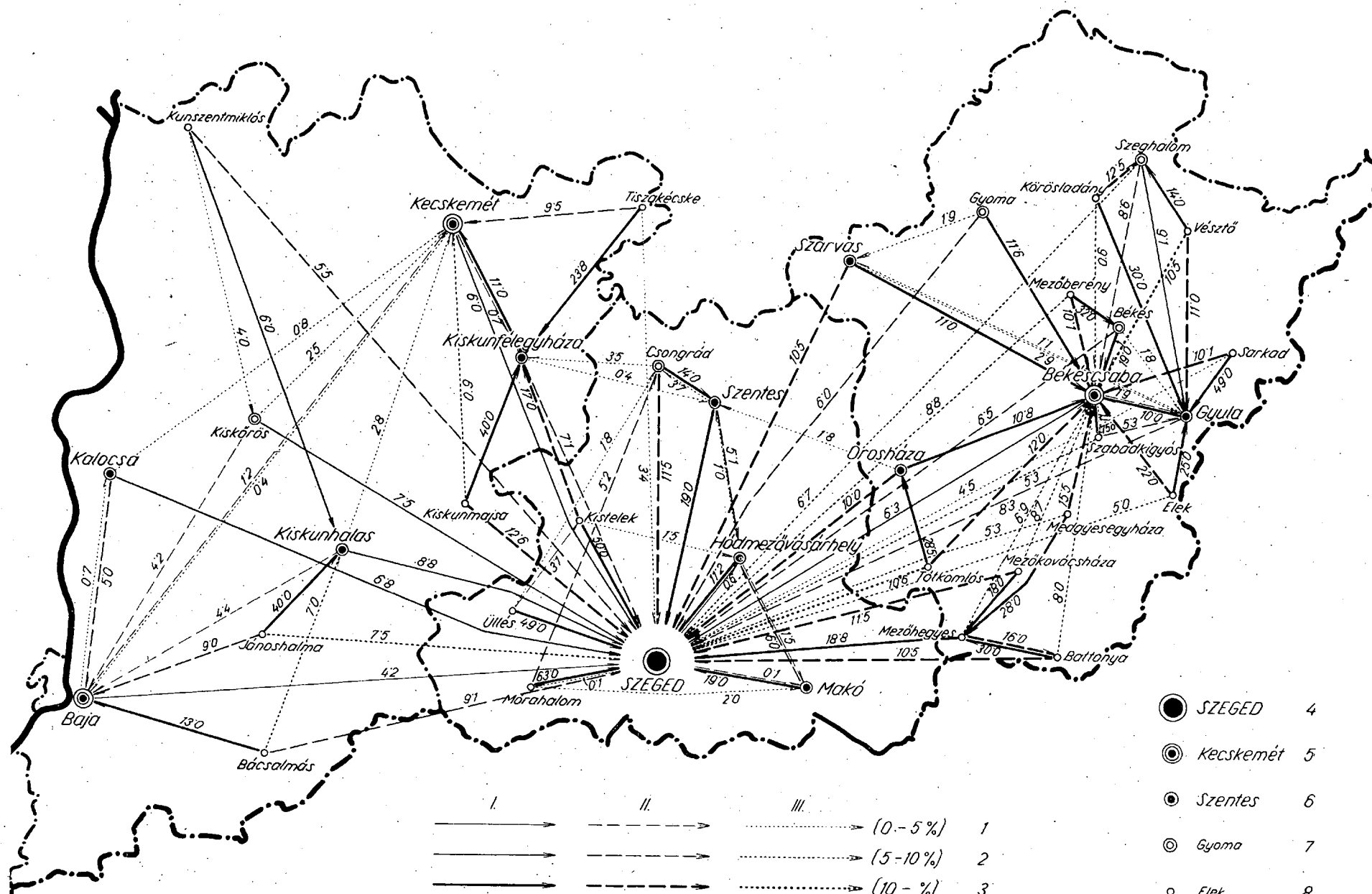
Fig. 3. The hierarchy of the educational centers of the southern part of the Great Plain and the relations between them.

I = primary attraction
II = secondary attraction
III = tertiary attraction
1 = attraction of 0.1—5% of the pupils
2 = attraction of 5.1—10% of the pupils
3 = attraction of more than 10% of the pupils
4 = regional center
5 = paracenter
6 = mesocenter
7 = subcenter
8 = microcenter

As the investigation of the system of attractions concerns only conditions in the southern part of the Great Plain, it gives, no correct picture of the peripheral areas where also the attraction of centers outside the examined area is felt. In this connection again the north western part of Bács-Kiskun county — Kunszentmiklós — may be mentioned.

It is noteworthy that with the exception of Körösladány and Vésztő all the centers of the southern part of the Great Plain gravitate toward Szeged at least tertiarily. The three paracenters, all the centers of Csongrád county — with the exception of the town of Csongrád which is strongly attracted by Szentes —, three important centers of the central part of Bács-Kiskun county and Mezőhegyes in southern Békés gravitate primarily toward Szeged.

Around the other centers the relation system of the paracenters is the richest. Between the other educational centers of the middle part of Békés county and the town of Békéscsaba intensive, complex and mutual relations have developed in which the role of Békéscsaba is dominant. The prominence of Baja as an educational center is proved by the fact that besides Bácsalmás the villages of Kiskunhalas, Kalocsa and even Kiskőrös gravitate toward it more than toward Kecskemét.

Through the extremely high ratio of their pupils some microcenters gravitate toward different higher-grade centers (Mórahalom, Üllés, Kistelek toward Szeged, Jánoshalma toward Kiskunhalas, Kiskunmajsa toward Kiskunfélegyháza, Szabadkígyós toward Békéscsaba, Sarkad toward Gyula), others form a special system reflecting the functional distribution (Mezőhegyes—Battonya—Mezőkovácsháza—Medgyesegyháza). The relatively high grade of attraction can be demonstrated in the case of some better developed centers, too. (Makó, Hódmezővásárhely, Szentes to Szeged, Békés, Gyoma and Gyula to Békéscsaba, and Kiskunfélegyháza to Kecskemét), Csongrád equally strongly gravitates toward Szentes and Szeged, and Orosháza and Szarvas toward Békéscsaba and Szeged.

III. Conclusions

1. *Methodological Conclusions*

a) By virtue of its quantitative criteria — the number and territorial distribution of the pupils — the educational function is suitable for determining the area of attraction of the centers.

b) The different degrees of specialization and consequently the different territorial frequency of the institutions representing the educational function provides us a basis for the determination of the attraction areas also according to the different levels.

c) On the basis of the difefrent levels the different quantitative characteristics and criteria as well as the relations between them the hierarchy of the centers can be determined.

2. *Factual Conclusions*

The educational function is not existing for itself, not independent of the other roles but is in interrelation with them, it develops together with them and in the long run approximately in similar proportions with them. Its territorial influence is determined by the same relations between centers and attraction areas as the other functions; the movement in which it manifests itself develops within the framework of the same infrastructure.

If we take this into consideration, on the basis of the educational function such conclusions may be drawn concerning the extent of the attraction areas as can be referred also to the totality of the functions.

Accordingly, using also the results of our earlier investigations, we can state the following concerning the definable areas in the southern part of the Great Plain:

a) In Bács-Kiskun county the areas of Kecskemét—Kiskunfélegyháza and Baja—Kalocsa are well distinct. Nor can the existence of the area of Kiskunhalas—Kiskőrös be questioned.

b) In Csongrád county the area of Szeged includes also Makó and its attraction area. In the northern part of the county the area of Szentes and Csongrád is distinct. The area of Hódmezővásárhely is of small extent and gravitates strongly toward Szeged, thus it cannot be considered independent.

c) In Békés county only the central area (of Békéscsaba and Gyula) is distinct. The areas of Orosháza and Szarvas are small, the relation between them is loose. The southern and northern parts of the county are attraction areas shared by several, often remote, centers.

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