DELIMITATION OF THE ATTRACTION AREAS OF CENTRES OF THE SOUTHERN GREAT PLAIN ON THE BASIS OF LONG-DISTANCE CALLS

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I. Introduction

Of late years, more studies have been published, which attempted to delimit the attraction area of the centres of the Southern Great Plain, or which were in close connection with the research of attraction area. These studies dealt with the attraction areas of manpower of the towns of the Southern Great Plain (Tóth, 1966), with the sudden expansion of the attraction area of Szeged in the sixties, (Krajkó—Tóth, 1969), the attraction areas of public health centres, (Pénzes—Tóth, 1970), and education centres (Tóth—Pénzes, 1970) of the Southern Great Plain, with the areas of goods supply of free market centres of Csongrád county (Pénzes—Tóth—Abonyiné, 1969) and with the delimitation of those suburban areas, in which the effect of the centres on change of population number, can be shown.

On the basis of our relatively comprehensive — though by no means completed — investigations, the attraction areas of the centres of the Southern Great Plain can already be delimited with reliability. So we have a possibility of good control, concerning the applicability, the exactness of the different methods, to be applied to the researches of attraction area. The aim of this study is — beside the conrete results — to present a method, which leads to an approximately correct result, despite of its apparent onesidedness, and which can be utilized usefully, combined with other methods in the researches of attraction area.

Method of the research

It is not a recent method to utilize the data related to the network of telephones in the investigations of settlement geography. In his debated study, treating the geometrical pattern of the „central places", Christaller took the number of telephone connections as basis (Christaller, 1933). Neef repeated Christaller's investigationson the territory of Saxony (Neef, 1950). In Hungary, Tibor Mendöl used similar data in 1944, investigating the validity of Christaller's theory among Hungarian circumstances (Mendöl, 1963). In the researches of attraction areas — to the best of our knowledge — till this time only Rozalia Éliás applied the data relating to the network of telephones, delimiting the attraction areas according to the number and proportion of the long-distance calls started from the centre (Éliás, 1954.)

We have deviated from the method, used by Éliás, so far as we have extended the area of investigation to the whole Southern Great Plain, on the one hand, enabling the attraction areas of the individual centres to be delimited in such a way, and we took for a basis the calls, starting from the communes towards the centre, instead of the long-distance calls of the centre. According to our opinion, this method serves better the purpose, and it can be utilized better to class a commune and to measure how intensely is it bound to the centre.

From the Post Office of Szeged, we have received the average monthly calls for the year of 1968, according to the communes, of the Southern Great Plain, and the list of the five localities called the most frequently together with the number of calls directed towards them. We have treated the material in such a way, that we have determined the centres by the absolute number of calls and the number of communes bound to them, then we have delimited zones according to the absolute or the relative majority of longdistance calls of the communes directed to the centres. Here, and at the delimitation of the attraction area of the individual centres, we have followed the adminisrative commune boundaries.

III. Results of the research

On the basis of the hierarchy of calls and the numbers of the attracted communes, attraction centres, partial centres and sub-centres can be delimited (Figure 1.)

1. *Attraction centres*

Attraction centres are 20 in number. They comprise towns of the Southern Great Plain and 6 small towns of commune rank which are district centres even today (Kiskőrös, Szeghalom, Békés) or they have lost this function of public administration in the recent past (Bácsalmás, Gyoma, Sarkad). The number of calls is high in attraction centres (monthly average: 3—40 thousands) and an extensive attraction area belongs to eash of them.

Its number of population, — aside from Hódmezővásárhely, being in exceptional situation — alternates from 10.000 to 110.000, and it numbers 4 to 30 communes.

a) The number of the first-order centres is four. They are the only centres on the Southern Great Plain, that are bound to Budapest directly, on the basis of the most calls. Among them the greatest is Szeged to which 22 communes are bound with the absolute majority of calls, and 8 communes with the relative majority of calls. (Table 1.) Apart from berti) the other communes of Csongrád County are also strongly attracted by Szeged: after the local centre, the most longdistance calls of this area are directed to Szeged as well.

The attraction area of Kecskemét extends over the boundaries of Kecskemét district. From the Dunavecse district Szabadszállás, from the Kiskőrös one, Fülöpszállás are attracted by the town. Kecskemét is the

second largest centre of the Southern Great Plain, considering both the population of the attraction centre, the number of the attracted communes and the number of calls. Its attraction, overlapped by the local centres, extends to the total two-thirds of Bács-Kiskun County, northwards from the Kalocsa—Kelebia line.

The third County seat Békéscsaba has particular position owing to the specific configuration of the centres of Middle Békés, and to the functional division of labour among them. With the exception of the northern and the southern confines of the county, its overlapped attraction extends over the whole area of Békés County, and it distinguishes itself by the number of calls but its direct attraction area is comparatively small: 8 communes with about 30.000 inhabitants. This area is also cut in two by the inserted attraction area of Békés commune. Eastwards, the attraction of Gyula, a district seat, performing a lot of county activities, however, is stronger (Békéscsaba is not a centre of district).

Baja is the second centre of the Southern Great Plain, considering the number of communes attracted by it, with the absolute majority of calls, the third, considering the number and the population of the attraction area, and the fourth on the basis of the number of the calls. In consequence of the large extension of Bács-Kiskun County and the peripheral position of the county seat, the overlapped attraction of Baja can be felt, up to the Kalocsa—Kelebia line as against Kecskemét, so the town can be considered the second county seat, practically.

Table 1.   Data of the first-order attraction centres

| Attraction centre | Monthly average number of calls (1000) | Number of calls directed to Budapest (%) | Number of communes | | | Number of population of the attraction area (1000) |
			with the absolute majority of calls	with the relative majority of calls	with transposition	
Szeged	40,0	22,1	22	8	—	108,9
Kecskemét	34,1	20,0	10	10	—	91,5
Békéscsaba	19,1	20,6	3	5	—	30,1
Baja	15,8	16,6	14	3	—	44,7

b) The second-order centres are not bound directly to Budapest any more. Their attraction area and the number of calls are much smaller, they do not or hardly show an overlapping attraction, so their delimitation from the above group does not give rise to difficulties. They are 9 in number, (Table 2.) Hódmezővásárhely exceeds them in long-distance calls, but its attraction area — beyond its large fields — is limited to two communes only. In consequence of its particular position —. its vicinity to Szeged, its lack of district functions etc. — it is the single second-order attraction centre, to which no commune is bound with the absolute majority of calls. The other second-order centres represent the same level, essentially, considering both the number of calls (from 7.1 to 11.9 thous-

and), the attracted communes (from 6 to 16), and the population of the attraction area (from 22 to 44 thousands). It must be mentioned that Kiskőrös commune is equal in rank with a town.

Table 2.

Data of the second-order attraction centres

| Attraction centre | Monthly average number of calls (1000) | Number of communes | | | Number of population of the attaching area (100) |
		with the absolute majority of calls	with the relative majority of calls	with transposition	
Hódmezővásár-hely	14,0	—	2	—	5,2
Orosháza	11,9	6	3	1	41,2
Szentes	11,3	3	7	—	29,6
Kalocsa	10,1	5	10	—	30,7
Kiskunhalas	9,7	4	6	2	44,0
Kkfélegyháza	9,4	4	5	2	38,4
Makó	8,8	6	9	1	28,9
Gyula	8,5	3	3	—	21,7
Kiskőrös	7,1	4	6	2	39,7

c) Two of our actual and three of our former district seat communes, and two of our towns with smaller attraction areas are classed among the third-order centres. (Table 3.) As compared with the previous group, their characteristics are of less value, but they are the centres of a comparatively large number of communes, centres of the population of an extended attraction area. Their connections with the first-order centres — as contrasted with the partial ones — are direct and unambigoous.

Table 3.

Data of the third-order attraction centres

| Attraction centre | Monthly average number of calls (1000) | Number of communes | | | Number of population of the attraction area (1000) |
		with the absolute majority od calls	with the relative majority of calls	With transposition	
Szarvas	6,6	2	3	—	19,0
Csongrád	5,0	1	3	—	10,5
Békés	4,5	2	2	—	7,4
Gyoma	4,0	1	1	1	12,4
Sarkad	3,9	1	8	—	16,4
Bácsalmás	3,7	—	7	—	15,4
Szeghalom	3,0	—	6	1	30,1

2. Partial centres

Communes are bound to several partial centres on some areas of the Southern Great Plain, where no central settlement has developed so far to be able to perform the central functions on an area as large as a district. In the districts of Dunavecse and Mezőkovácsháza there exist 3 partial centres each. (Table 4.). To these districts no commune is bound

with the absolute majority of calls, communes with the relative majority of calls are few, and their attraction areas are small. Among them Mező-kovácsháza can be considered a transition between the attraction centres and the partial centres. The connections of the partial centres are mutual and intense.

Table 4.

Data of the partial centres

| Partial centre | Monthly average number of calls (1000) | Number of communes | | | Number of population of the attraction area (1000) |
		with the absolute majority of calls	with the relative majority of calls	with trans-position	
Dunavecse	3,8	—	2	—	5,5
Mezőkovács-háza	3,5	—	8	—	24,7
Medgyesegyháza	2,9	—	5	—	10,3
Kunszentmiklós	2,8	—	3	—	5,2
Solt	2,6	—	3	1	8,1
Battonya	1,7	—	3	—	4,6

3. Sub-centres

Sub-centre has been established on the attraction areas of the centres of high-order, where the attraction of the centre is weaker because of the distance or other facts. On the other hand, sub-centres developed on areas where the attraction of the centre is high in absolute value but some communes are bound to another settlement with the most calls after the centre of the attraction area (secondarily).

We have regarded as sub-centres those settlements, to which one commune is bound at least with the relative majority of long-distance calls, or two ones with the most calls after the attraction centre (secondarily). On this basis, 24 sub-centres can be delimited on the Southern Great Plain. (Table 5.) Among them Kiskunmajsa and Jánoshalma approxi-mate the level of the partial centres, they overlap the attraction of the centre within the attraction area of Kiskunfélegyháza or Kiskunhalas, resp. Kistelek is not able to do this over against the attraction of Szeged; owing to its large secondary attraction area, it belongs to the most de-veloped sub-centres. There are 5 sub-centres in the attraction area of Szeged, 3 at Baja, 2 at Kecskemét, Kalocsa, Kiskőrös and Kiskunhalas each, 1 at Makó, Orosháza, Békéscsaba, Szarvas, Szeghalom, Gyoma, Kiskunfélegyháza and Solt each. The sub-centres such as Szőreg, Móra-halom, Csanádpalota, that developed on the attraction areas of the centres have particular activities.

4. Interaction of the centres

On Table 1. — by reason of the percentage of the initiated calls — we have also indicated the interaction of the centres. From the discre-pancy of the intercalls of two centres in proportion to all the initiated

calls, we can draw conclusions concerning the subordination and hierarchy of the centres.

Szeged occupies the top of the hierarchy of the Southern Great Plain. From among the three first-order centres it attracts Békéscsaba and it

Table 5.

Data of the sub-centres

Sub-centre	Monthly average number of calls (1000)	Number of communes with the relative majority of calls	secondarily	Number of population of the attraction area (1000)
Jánoshalma	3,5	2	—	4,2
Kiskunmajsa	3,3	2	2	10,5
Mezőberény	2,8	—	2	4,4
Kistelek	2,5	—	7	18,9
Tótkomlós	2,4	1	1	3,7
Szőreg	2,4	—	4	7,3
Dunapataj	2,4	—	2	2,2
Izsák	2,1	—	3	7,6
Soltvadkert	1,9	1	1	4,9
Sükösd	1,8	—	2	5,0
Kecel	1,6	1	1	5,5
Dévaványa	1,4	1	—	2,0
Vésztő	1,4	1	—	1,1
Tompa	1,3	—	2	6,9
Kondoros	1,3	—	2	5,6
Harta	1,2	1	—	0,8
Bácsbokod	1,2	—	3	6,5
Lakitelek	1,1	—	2	5,6
Üllés	1,1	—	2	4,5
Vaskút	1,0	—	2	5,5
Csanádpalota	0,9	1	2	2,4
Mórahalom	0,9	—	4	16,3
Miske	0,7	—	2	3,1
Pusztamérges	0,5	—	2	4,7

exercises a considerable attraction on Kiskunfélegyháza and Kiskunhalas, which are bound to Békéscsaba, or Kecskemét, resp. (6—9% of the calls). Within Csongrád County it is Hódmezővásárhely, that is strongly attracted by Szeged (41.0% being a considerable value in urban relations, as the towns exceed the communes in the diversification of Calls), however, the relative numbers of Makó (29,7%), Szentes (22,7%), and Csongrád (17,5%), are high as well. In spite of this, Csongrád is already attracted by Szentes for the most part (40,4%). Makó and Csongrád are attracted also by Hódmezővásárhely, while the interaction of Szentes and Hódmezővásárhely is equable, practically. It deserves attention that 4,1% of the calls of Hódmezővásárhely is directed towards Orosháza.

In Békés County, a more complicated system of interaction has developed. The most part of the centres is attracted by Békéscsaba, but a high proportion is seen only in the case of Békés and Gyula (34,5%). Orosháza, Gyoma and Szeghalom are attracted by the county seat with

about 18%, but Szarvas only with 14% of the calls. Sarkad and Gyula show a stronger interaction than Sarkad and Békéscsaba (21,7 resp. 15,5%). Gyoma is attracted by Szarvas, and Szarvas—Orosháza. The interaction of Gyula and Békés is equable and comparatively loose. It is remarkable, that 17,0% of the calls of the county seat is directed towards Gyula. It is the highest proportion of attraction in the case of the first-order centres, — not mentioned the calls of Budapest — and it has come into being in consequence of the functional division of labour between Békéscsaba and Gyula. The interaction of the partial centres of Southern Békés are interesting. Battonya is attracted by Mezőkovácsháza, and the latter — even if with some difference — by Medgyesegyháza, which deserves attention, as Mezőkovácsháza is the seat of the district. Their relations to the high-order centres from the South to the central part of the county are the following: Battonya is bound to Orosháza as against Békéscsaba, Mezőkovácsháza is much rather, and Medgyesegyháza is bound decisively to Békéscsaba, though their relations to Orosháza have remained.

In Bács-Kiskun county, the most part of the centres is bound to Kecskemét. Apart from the high proportion of Kiskunfélegyháza, which is in close connection with the county seat, the proportion of calls directed to Kecskemét is between 7.3 and 16,8%. Bácsalmás is bound to Baja, with a proportion of 32,9%. Baja exercises strong attraction on Kalocsa, and as against Kecskemét, it attracts Jánoshalma, one of the most developed sub-centres as well. The most calls of Kecskemét are directed to Baja beside Budapest and Kiskunfélegyháza.

Apart from the attraction of the county seat, Kiskőrös is attracted by Kiskunhalas, and Kalocsa, Kiskunhalas and Kiskunfélegyháza are also attracted by Szeged. There is an interaction among Dunavecse and the other two partiaé centres, which can be considered equable. Kunszent-miklós and Dunavecse are attracted Kecskemét and Solt by Kalocsa.

IV. Evaluation of the method

It is clear, — on the basis of the comparison with the results of the studies, mentioned in the introduction, — that by the help of the applied method, it has managed to delimit the attraction areas of the individual centres, on the same or similar way as earlier. It concerns not only the direct attraction area, marked on the map too, but the attraction area overlapped by other centres. The order and hierarchy of the individual centres can be stated in accordance with other investigations. Accordingly, all the attraction factors, other-wise divergent in character and regional impact, come to a common denominator in the number and distribution of long-distance calls. Beside its simplicity this complex character is the greatest advantage of the method.

Naturally, — as we have mentioned in the introduction — this method does not replace other methods used in the research of attraction centre and area, it can be utilized only together with them. In conse-quence of its complex character, this method hides different regional

attraction of the investigated functions, although their clear differentiation is often necessary. However, the delimitation of the synthetical attraction area encounters certain difficulties, since the attraction of some functions of great importance scarcely appears in the calls, so their regional influences are not in accordance with their significance. In consequence of the low telephone-density, the direct attraction areas, delimited by the utilized method „insist on" better to the district-boundaries, than the areas outlined by other methods.

At our concrete survey — chiefly at the delimitation of the overlapped attraction areas, — it was also a limiting factor, that at each commune only the data of the five centres called most, have been available. If we used the data of a given year broken down according to months, instead of the monthly average, we could draw a more dynamic picture, which would be able to express the seasonal changes of the regional relations as well.

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