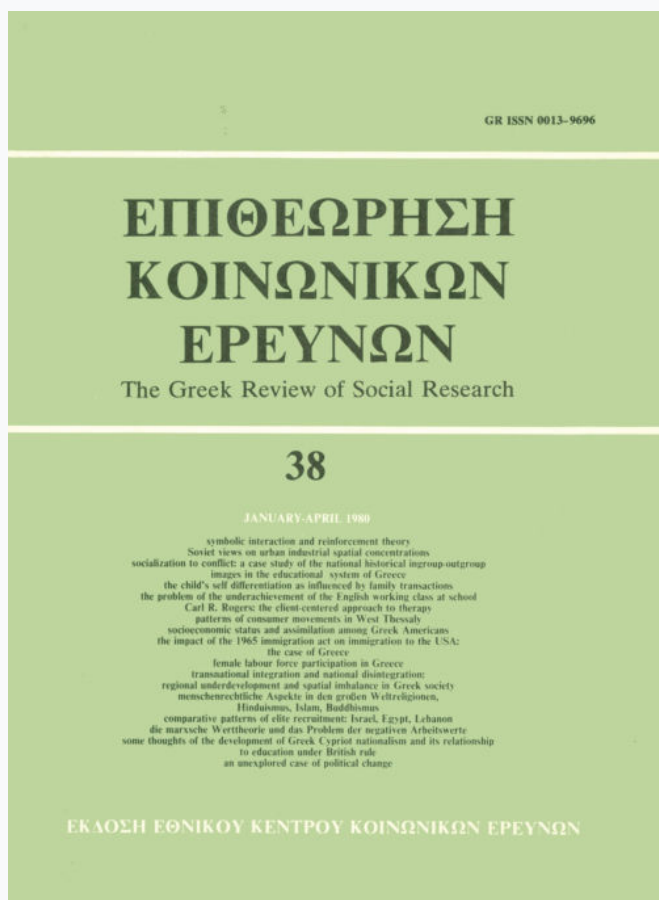


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Patterns of consumer movements in west Thessaly

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patterns of consumer movements in West Thessaly

by

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ABSTRACT

The structure of the settlement system of West Thessaly has been shown to consist of a well-defined four-level hierarchy, with the most important places being the two *nomos* seats of Trikala and Kardhitsa, and below them six smaller urban centres. This paper examines the extent to which the structure is reflected in the functioning of the system as revealed by patterns of consumer movements. Using information collected by circulating questionnaires in the region via the secondary schools, the patterns of movement for thirteen goods and services are described. Differences in the average distances travelled for different goods and services were found, reflecting the differential use made of the four levels of the hierarchy by consumers. The provision of goods down to relatively low levels of the settlement hierarchy in Greece means that intensive use is made of small urban settlements for the purchase of many consumer durables. Only for the highest order functions do Trikala and Kardhitsa dominate within the region, and for these large centres outside West Thessaly (especially Larissa, Athens and Thessaloniki), exert an influence. After considering briefly the theoretical aspects of these findings, the paper concludes with an assessment of their implications for town and regional planning.

Although the nature of the settlement system forms one of the key elements in the economic and demographic stagnation of much of Greece outside of Athens and Thessaloniki, very little research has been undertaken on either its structural or functional characteristics. Moreover, such work that has been published has taken a rather general, subjective approach, so that there is a lack of consistency between studies done in different areas (compare, for example, National Polytechnic 1971, 1973). The work on consumer movements in West Thessaly reported here forms part of a larger study of the settlement system of the region which is based primarily on data collected in *ad hoc* surveys. The study as a whole (Bennison 1977) forms one of the most detailed such investigations to have been made in Greece, but it is nevertheless still very much exploratory in character, the principal intention being to provide a suitable context within which more substantive work can be undertaken.

the structure of the settlement system of West Thessaly

The structure of the settlement system of West Thessaly has been described in detail in an earlier paper (Bennison, 1979a) and it is therefore sufficient here to summarise the principal features in order to provide a framework for the examination of consumer movements. Analysis of the structure was based on data collected by field survey and it was confined to the plain area of the region because of time and resource constraints. The necessity for a special survey arose because published data on commercial establishments (NSSG 1971) are not sufficiently disaggregated to the level of individual establishments, and neither are any published data available on non-commercial services. Data were therefore collected in the study area on the numbers of functions and establishments in 166 settlements, 153 of which did contain central functions.

Of the 88 functions identified for the study, 55 were classed as «retail» and 33 as «non-retail» (administrative, educational, professional etc.).

Analysis of these data indicated that a distinct four-tier hierarchy of settlements could be identified in the region of West Thessaly, each level being characterised by its own particular «basket» of functions (or, marginal hierarchical functions) which differentiated it from the level below. The two *nomos* seats of Trikala and Kardhitsu were classed as *A*-level settlements. Below these the six other settlements of *dhimos* status fell into the *B*-level group (Kalambaka, Sofadhes, Mouzakion, Pili, Palamas and Farkadon). It was possible to identify a third group of settlements (*C*-level) whose functional provision was noticeably greater than the majority of settlements, which fell into the *D*-level group where the degree of functional provision was directly proportional to settlement population (Fig. 1).

Examination of the differences between the various hierarchical levels indicated that the *A*-level centres were not distinguished from *B*-level ones so much by the range of functions which they possessed as by the number of outlets of the various functions which they contained. Very few functions are, in fact, confined solely to Trikala and Kardhitsu, although the range does increase if Kalambaka is excluded. The main distinction between *B* and *C*-level settlements is in the provision of non-retail services: only 40 per cent of the *B*-level marginal hierarchical function are retail, whereas with *C* and *D*-level settlements the proportion is 75 per cent and 72 per cent respectively. The kind of retail functions which characterize the *B* settlements are those which might be considered luxuries rather than necessities (jewellery, books and gifts, for example), and the non-retail functions are mainly professional or financial activities (lawyer, dentist, banks, for example). In contrast, the retail functions which characterize the third hierarchical level tend to be those which could be classed as necessities, but not those supplying goods which need frequent purchase (hardware, chemist, for example). Finally, the *D*-group was found to have a large number of marginal hierarchical functions, but only the coffee shop, general store, kiosk, barber, primary school, co-operative and commune office functions occurred in more than 60 per cent of the total, although it should be noted that the range of goods available with a village general store can be very wide.

the survey of consumer movements

Investigation of the patterns of consumer movements in West Thessaly was intended to produce a broad picture of the functioning of the settlement system which could be related to the structural characteristics revealed in the preceding analysis. A

secondary benefit of the study was the provision of some basic information which could act as the starting point for more detailed research into the social, economic and perceptual influences on consumer movements in this kind of area. It was not intended to produce data that could be incorporated either into gravity-based interaction models or into models of consumer behaviour.

The survey procedure that was adopted was to circulate simple questionnaires through the region via the secondary schools. This allowed the whole area to be reached without requiring personal visits, and, by giving the questionnaires only to 17-18 year old pupils for completion by their parents, it was considered the most suitable way of ensuring accurate replies. Acting through the schools also provided a semi-official aura to the survey, and this may have contributed to the generally high return rate. The main disadvantage of this method of doing a survey was that it introduced some bias into the sample. The respondents would have all fallen into a similar age group and would be members of family units with at least one child in the late teens. There was also some spatial bias inherent in the method since high school attendance rates are slightly higher in those places which contain a school. However, given the limited aim of the survey, it was considered that these disadvantages were far outweighed by the ease and coverage that this method gave.

The questionnaire was designed to be as simple and unambiguous as possible. Respondents were asked to place an X in a matrix to indicate the settlement(s) which they had visited recently to purchase each of nine different goods, or make use of four different services: if they had not purchased a good or visited a service within the previous three years, or if there was any uncertainty, they were asked not to reply. The goods and services chosen were selected on the basis of the earlier study as being ones which clearly characterized particular hierarchical levels, and were as follows: sugar, meat, shoes, clothing, radio or television, watch or jewellery, cooking utensils, records, motor car, optician, chemist, doctor's surgery and dentist. The purpose of the survey and instructions on how the questionnaires were to be completed were given, and the confidentiality and anonymity of all questionnaires and the voluntary nature of the survey were emphasized. In addition, these facts were outlined verbally to the pupils when the questionnaires were issued. After completion by the parents, the forms were returned and collected from the schools. In the case of four small High Schools in Kardhitsu *nomos* and two in Trikala *nomos* located in the Pindos mountains, the forms were sent with a covering letter through the Secondary Education divisions of the prefectures, and they were returned by post.

FIGURE 1. The hierarchy of settlements in West Thessaly



It was intended that questionnaires should be given to 15 per cent of the secondary school population as this would yield a sufficiently large number to ensure that most settlements had at least one respondent. In order to simplify the procedure, however, the numbers of forms that were sent by post to the smaller, remote schools was generally more than 15 per cent, and so altogether 2,164 questionnaires were issued, representing 15.2 per cent of the High School population. Of these, 1,646 were returned of which 49 were rejected either because the place of residence had not been filled in, or the name was illegible, or the place of residence was outside West Thessaly or, in one case only, the replies were obviously fabricated. The following analysis of consumer movements is therefore based on 1,597 questionnaires, 73.8 per cent of those issued. The survey succeeded in covering all of West Thessaly, and questionnaires were returned from 246 settlements. Because *Kardhitsa nomos* has slightly better secondary school provision than Trikala, the coverage is relatively higher, but even within the two *nomoi* there are variations in the percentage cover between settlements. About 70 settlements are represented by only one questionnaire, and in the case of specific goods and services other settlements may only be represented by one reply, or by none at all. This generally precludes any firm conclusions to be drawn about consumer spatial orientation within individual settlements, but it does not hinder analysis at the regional scale.

A computer program was written to handle the data and to calculate various parameters. The data input for a run of the program was a $n \times 16$ matrix of the movements for any given good or service, where n = number of settlements with at least one purchase of the good or service recorded. In addition, the co-ordinates of all the settlements on a grid of kilometre squares were included.

The program calculated the percentage use of each central place by each settlement for the good or service in question, and the percentage of total movements which each central place accounted for. As well as this, the straight line distance of each individual movement in kilometres was calculated by substituting the co-ordinates in the Pythagorean formula

$$Dab = \sqrt{(Ea - Eb)^2 + (Na - Nb)^2}$$

Where, Dab = straight line distance between points a and b

Ea, Eb = eastings of points a and b

Na, Nb = northings of points a and b

The mean distance of movement for each good or service was calculated, together with the standard deviation and standard errors of the mean and standard deviation. Using these parameters, it was then possible to calculate the range of each good or service by substituting the appropriate values in Tarrant's (1967) formula

$$\text{Range} = \bar{x} + (2 \cdot \text{SE}(\bar{x})) + (2 \cdot \text{SD}(x)) + (4 \cdot \text{SESD}(x))$$

where \bar{x} = mean shopping distance

$\text{SE}(\bar{x})$ = standard error of the mean

$\text{SD}(x)$ = standard deviation of shopping distance

$\text{SESD}(x)$ = standard error of the standard deviation of x

Given a normal distribution, the range is therefore defined as the limit below which 97.5 per cent of the cases in a sample should fall.

A crucial part of the analysis of the data was to map them. To represent the movements it was decided to show percentage flows from each settlement to each central place. This had the advantage of overcoming the problem of drawing a large number of lines to represent individual movements which would have been difficult not only because of the numbers involved but also because of the nucleated nature of population distribution. On the other hand, the disadvantage of this technique is that where the number of recorded movements from a settlement is small (perhaps only one), and those movements may be atypical, a distorted impression may be given of the spatial orientation of consumers in the settlement. For this reason the maps need to be interpreted in terms of the general patterns which they show rather than any emphasis being placed on specific details.

the patterns and structure of consumer movements

The thirteen goods and services chosen for the analysis were taken as being representative of particular hierarchical levels. If the well-developed hierarchical structure of the settlement system which was found is reflected in its functioning, then clear differences should be observed in the mean distances of travel and the ranges of these goods, and in the proportion of consumer movements which are inter-settlement: the higher the order of a good or service then the higher should be all of these values. The parameters are shown in Table 1 where the goods and services are entered in order of median threshold population (see Bennison, 1979a). A number of qualifications should, however, be noted.

Firstly, the threshold populations for sugar, meat, cooking utensils and records are those for general stores, butchers, hardware and music shops respectively. These goods may be sold through other establishment types as part of a product mix which was not sufficiently specialized to be identified in the first part of this study. Secondly, the number of purchases of sugar, meat, shoes and clothing exceeds that of questionnaires used (1,597): as these can be regarded as the four most basic goods this might be expected, and that of these shoes and clothing are the goods with most recorded purchases could be explained in terms of the greater likelihood to purchase these from more than one settle-

ment. Thirdly, various mean distances of movement could have been calculated, but those in Table 1 are for inter-settlement movements since the data which were collected did not permit any analysis of intra-settlement movements. The first mean (\bar{x}_1) is that for all inter-settlement movements, and the second (\bar{x}_2) is for those that are intra-Thessaly (that is, excluding primarily those to Athens and Thessaloniki). Fourthly, the value for the range of the goods and services is calculated only on the basis of intra-Thessaly movements since for all goods and services (except Cars) the great majority of purchases were made within Thessaly, and to have included purchases from other places in Greece would have given exaggerated values.

Fairly close rank relationships can be seen between the various parameters in Table 1. On the basis of this table it is possible to consider an aggregation of the thirteen goods and services into sub-groups for the purposes of further analysis as follows:

1. Sugar, meat (good)
2. Cooking utensil (low cost household good)
3. Shoes, clothing, radio/TV, jewellery/watch, record (consumer durables)
4. Doctor, dentist, chemist (standard medical services)
5. Optician (specialised medical service)
6. Car (high cost luxury good)

1. Sugar and Meat

As food is the most basic of all commodities its provision is one of the lowest order retail functions: general stores have a threshold population of 109 while specialist butchers have a threshold population of 673. Consequently the expectation would be that a high proportion of movements to buy sugar and meat should be intra-settlement, and that those movements that are to central places would be relatively short. The data confirm both of these hypotheses. The numbers of intra-village or town movements for the purchase of sugar and meat were 1099 and 1091 respectively (both about 64 per cent of total), mean distances of movement to central places were 13.9 kms and 10.8 kms, and ranges were 42.1 km and 27.2 km. Only six and four purchases respectively were made outside West Thessaly.

The map of movements to buy sugar emphasizes these results (Fig. 2). In many villages, particularly those at some distance from the main central places, there is no outward movement recorded, and few long movements are found. However, from villages in the immediate vicinity of large centres, especially Trikala and Kardhitsa, a higher proportion of purchases were made outside the places of residence. While the *A* and *B* level central places are by far the most important foci of inter-settlement movements, it is interesting to note that some of the third level of settlements identified in

TABLE 1. *Consumer Movements: Mean Distances of Movement, Ranges, Proportion of Purchases Which Are Outside Place of Residence*

	Threshold Pop.	No of Purchases	X1* (kms)	X2** (kms)	Range (km)	% inter- settle- ment moves
Sugar	109	1,645	13.9	13.9	42.1	33.2
Meat	673	1,645	10.8	10.8	27.2	33.7
Doctor	1,045	1,548	21.6	15.7	44.2	55.7
Shoes	1,132	1,755	27.5	17.8	46.4	65.9
Clothing	1,251	1,820	30.6	18.9	47.5	69.4
Chemist	1,419	1,577	16.1	14.6	36.3	60.4
Cooking utensil	1,428	1,406	16.1	13.8	35.1	52.7
Radio/TV	1,846	983	28.9	17.7	46.5	62.4
Jewellery/ watch	2,219	1,135	25.0	17.4	44.4	64.2
Dentist	2,219	1,410	14.8	14.6	37.7	57.8
Optician	15,569	955	26.2	21.2	49.1	77.0
Records	15,569	736	32.1	19.3	48.0	67.8
Car	15,569	160	84.9	31.4	87.6	82.5

* Mean of all inter-settlement moves.

** Mean of all inter-settlement moves within Thessaly.

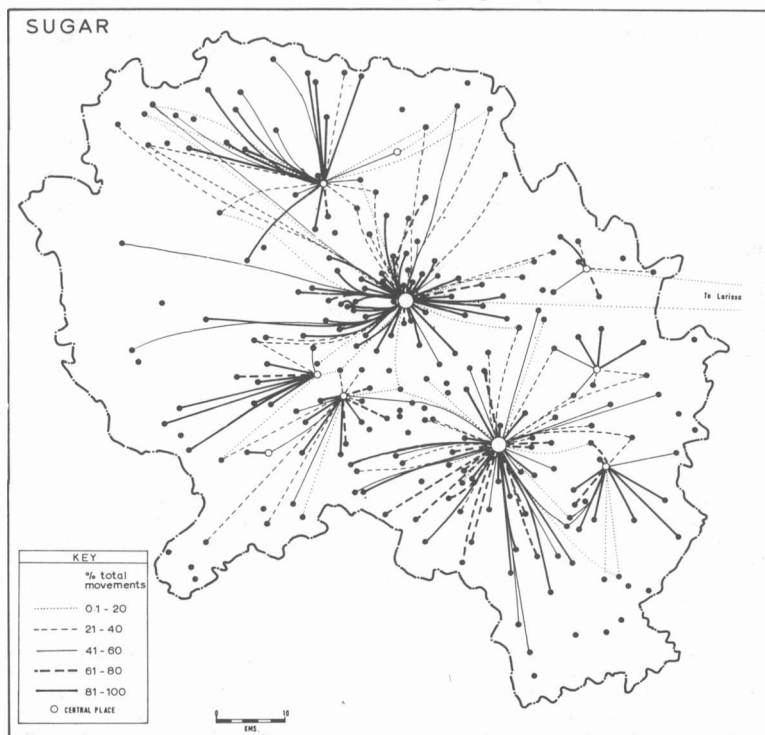
the hierarchical analysis (for example, Fiki, Leondari) do act as centres for food provision. This is on a very limited scale, however, and the implication must be that their role as local service centres supplying low order goods is not a very significant one. The trade areas of the eight principal central places are generally clearly defined, and there is not much evidence of the two *A* centres extending their influence into areas beyond the *B* centres.

The nature of these products and their frequency of purchase mean that comparative shopping is not usually considered to be an important feature of consumer behaviour. This implies that large settlements do not have any special competitive advantage over smaller ones. Nevertheless, the fact that the major central places do act as foci for some inter-settlement movements suggests that this kind of purchase may often be made as part of a multi-purpose trip which is perhaps associated with a visit to a weekly market where rural buyers may also be selling some of their own produce.

2. Cooking Utensil

This is a low cost household good which is available at low levels of the settlement hierarchy. The threshold population of 1,428 cited in Table 1 is that of specialist hardware shops, but these articles are frequently found as part of the assortment of goods in village general stores. Their relatively low cost and basic nature mean that distances travelled by consumers to buy them are unlikely to be very high and neither should there be any

FIGURE 2. Movements for sugar



substantial competition between centres of different hierarchical levels for their provision. This is confirmed by the map of movements (Fig. 3). The proportion of recorded movements which are inter-settlement was the lowest after Sugar and Meat, and both the average distance of movement and the range are of similar rank positions.

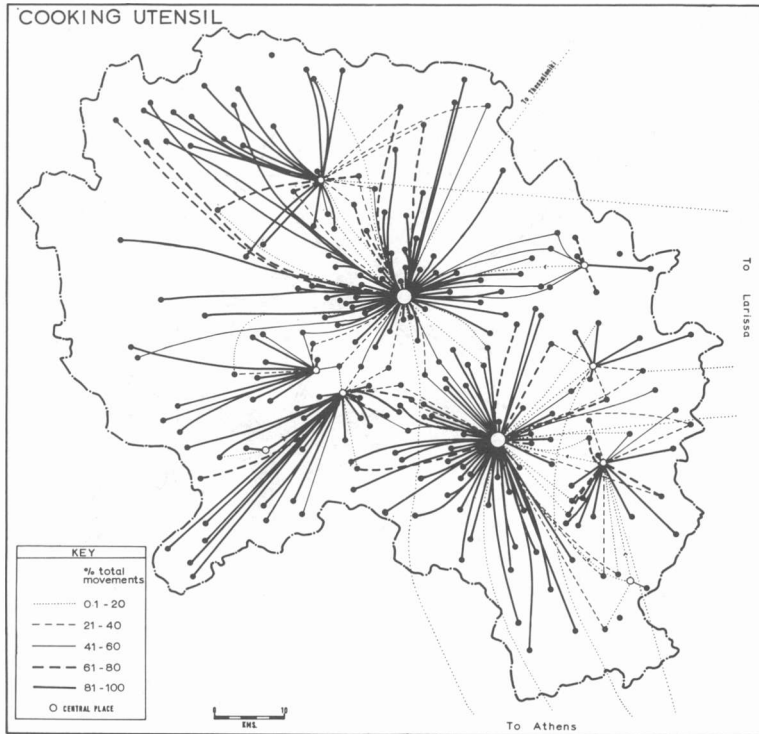
The map of consumer movements shows a similar structure to that for Sugar and Meat except that considerably more villages record purchases in central places. Even so, 8.0 per cent of all purchases were made in *C* or *D*-level settlements. Again, the hinterland areas of the eight principal central places seem to be fairly clearly defined. There is little overlapping and break points occur at approximately the half way point between competing centres. Of the *B*-level settlements, Farkadon and Palamas have the smallest hinterlands both in terms of area and population, and the number

of purchases recorded in them by people living in other places is consequently lower than for the other four *B*-level centres. The former two accounted for only 4.6 per cent of inter-settlement moves, whereas the other four accounted for 28.5 per cent altogether. The specialized hardware establishment was identified in the earlier analysis (Bennison, 1979a) as a hierarchical marginal function for *C*-level centres, but the map shows that in the detailed study area only Leondari acted as a very localized focus for this good while one settlement in the Pindos acted similarly. Less than one per cent of purchases were made outside W.Thessaly.

3. Shoes, Clothing, Radio/TV, Jewellery/Watch, Records

These are the five consumer durables amongst the goods. The first four are functions which are diagnostic

FIGURE 3. *Movements for cooking utensil*

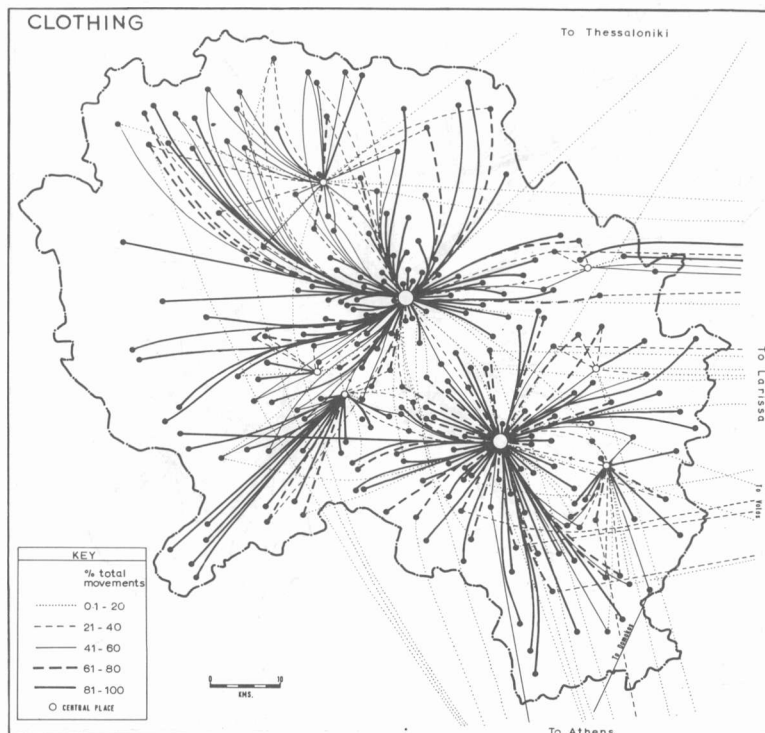


of *B*-level centres, while music shops are confined to *A*-level centres. Nevertheless, records are sold in some shops in *B*-level centres even though they were insufficiently prominent to be considered as separate functional units in the earlier analysis. They do, however, have a higher mean distance of movement and range than the other four goods which is indicative of their higher order status. In all five cases comparative shopping is likely to be an important element of consumer behaviour. This should therefore favour the larger *A*-centres rather than those below because of the greater number of shops selling these items which they have, even if there are no significant differences in the size and organization of the shops. The data appear to confirm this hypothesis because the mean distances of movement and the ranges are all higher than for the three standard medical services (below) which are similarly diagnostic of *B*-level centres but where the

comparative element is less likely to arise in patronization of them. The proportionate share of purchases/visits in *A*-level centres is also higher.

The number of recorded purchases of clothing and shoes is considerably greater than for the other three goods. Given that these are basic items and their greater frequency of purchase by a family unit, this is to be expected. The general pattern of movements, however, show broad similarities, as Figures 4 and 5 illustrate. Trikala and Kardhitsa extend their influence into *B* centre hinterlands, perhaps most notably in the cases of Farkadon and Palamas but also into those of the other centres as well. Larissa appears to be the dominant centre in the south-eastern part of Trikala *nomos*. Athens and Thessaloniki are the place of three to five per cent of purchases, which is perhaps not insignificant particularly if these purchases are of higher value than those made within the region. It seems unlikely that

FIGURE 4. *Movements for clothing*



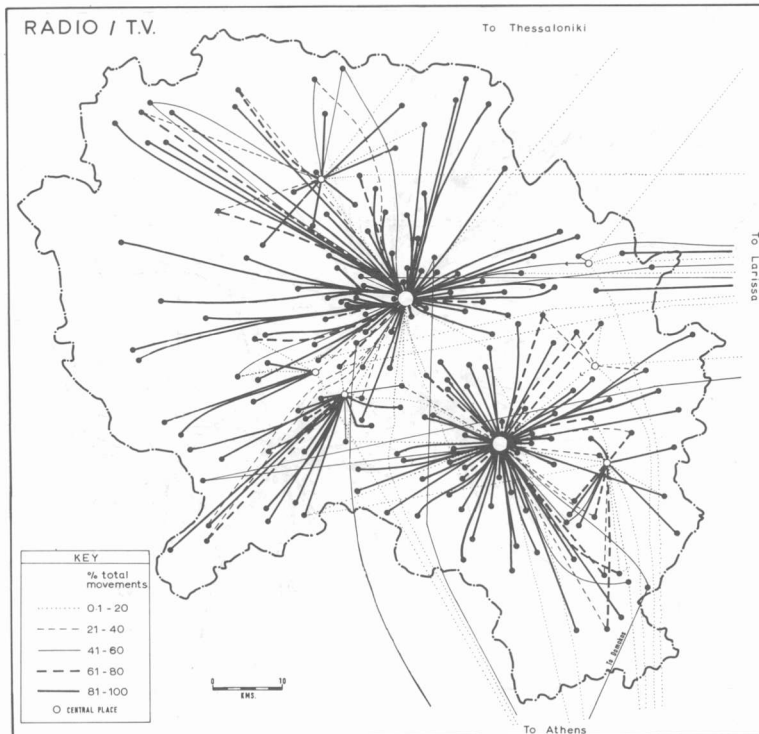
most purchases for these goods in either Athens or Thessaloniki are made on specific shopping trips; rather, advantage may be taken of visits to relatives or holidays in these cities to do some shopping since the variety of available goods is inevitably larger than in the provinces.

4. *Doctor, Dentist and Chemist*

These are the three basic medical services. All occur in *B*-level centres and Doctor's surgeries are found in *C*-level as well as some settlements which did not specifically emerge as central places in the hierarchical analysis. Because of the basically non-commercial nature of the first two activities, and the specialised nature of the third, the expectation would be that centres are not competitive with each other, and relatively low mean distances of movement as well as clearly

defined hinterlands should be characteristic. Generally this is the case although visits to Doctor's surgeries do form a slight anomaly. In terms of threshold population, this is the lowest order function but its range and mean distances of movement are higher than those of both Chemists and Dentists. This can be explained by the existence within the category of *Doctor* of a wider variety of types, ranging from the village doctor through to specialists. While movements to the former are obviously going to be short, those to specialists will be longer (compare Opticians, below). Hence, despite the high ranges and mean distances for Doctors, the proportion of movements that are inter-settlement is lower than for either Dentists or Chemists, while the proportion of movements to places outside West Thessaly is higher. The proportion of visits to Trikala and Kardhitsa are similar for all three activities, but at the next level differences can be seen. Over 7 per cent

FIGURE 5. Movements for radio/TV



of visits to Doctors' surgeries are within villages, while this is not a significant feature of the other two activities. On the other hand, the use of *B*-level settlements for Doctors is relatively lower than for either Chemists or Dentists, and this can be interpreted in terms of the more uniform character of these two functions.

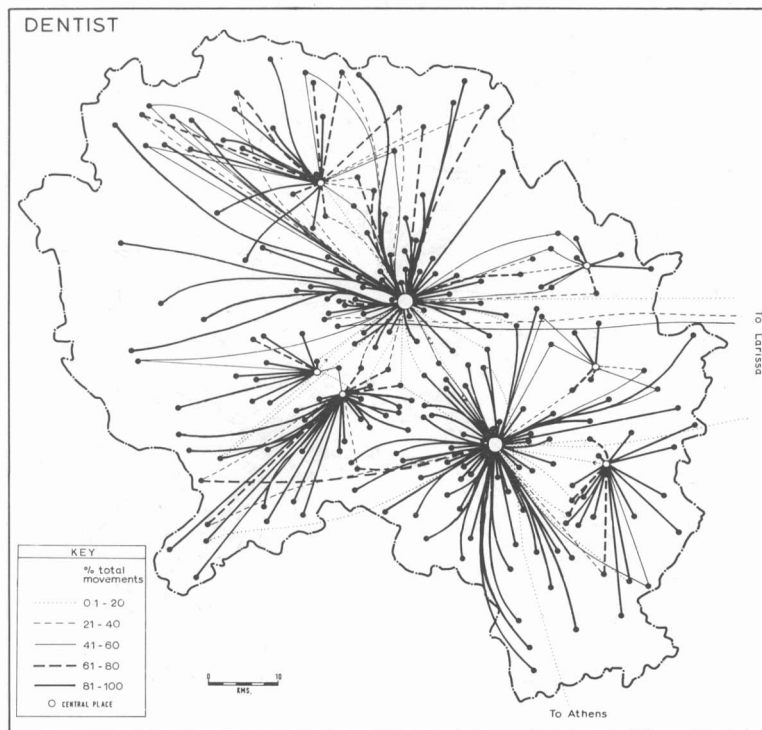
Overall, the patterns of movements, as illustrated by that for Dentists (Fig. 6), show the expected clearly defined areas for each central place although there is a slightly higher degree of overlap than for Meat and Sugar, particularly by Trikala into Kalambaka's hinterland. In most cases, however, the hinterland boundaries seem clearly defined at the approximate mid-points between settlements. For Dentists and Chemists, movements are almost exclusively to *A* and *B*-level settlements, but for Doctors some of the *C*-level centres do act as centres as well as a small number of settlements

which fall into the *D* category. It is for this function, as well as policing, that these small settlements most clearly fulfil a central place role.

5. Optician

This service is performed by someone with professional training. In addition to the concept of threshold, the social desire of most professional people to live in a major town or city is a factor which explains the location of opticians within West Thessaly solely in the towns of Trikala and Kardhitsa. The nature of the activity means that consumers are unlikely to make any kind of comparative trips, and that they will tend to go to the nearest optician to their place of residence. The data suggest this by indicating that relatively few people go outside West Thessaly to an optician and the mean distances of movement and range are less than for

FIGURE 6. *Movements to a dentist*



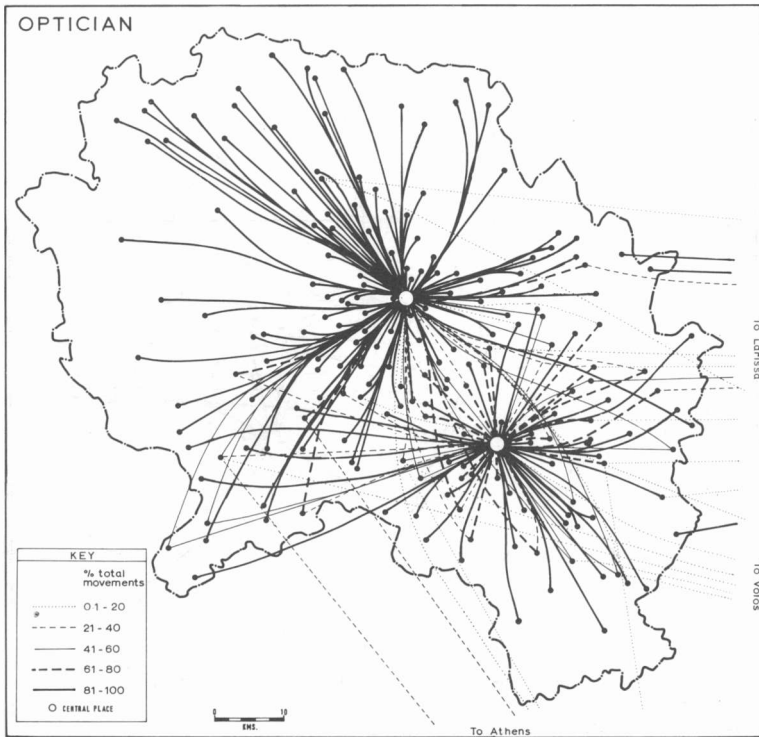
Cars, which have the same threshold population.

As Fig. 7 shows, the pattern of movements within West Thessaly is not quite as symmetrical as may have been expected. Although both Trikala and Kardhitsa dominate their respective *nomoi*, Trikala's influence does extend into Kardhitsa *nomos*. This is not only into the mountainous area which forms Mouzakion's hinterland for lower order goods and services but also into the plain area. As this is the only one of the thirteen goods and services in which Trikala does appear to exercise some superiority over Kardhitsa in its central place function, it lends some credence to the notion that Trikala acts as a sub-regional medical centre for West Thessaly below the level of Larissa. Its hospital is rather larger than Kardhitsa's and the town contains more private clinics. Larissa and Athens act as the main centres outside West Thessaly, attracting a similar number of visits as Doctors, and Volos may act as a secondary centre within Thessaly.

6. Cars

Although Cars have the same threshold population as Opticians, the nature of the goods and the costs involved produce a very different pattern of movements. Cars are almost exclusively an imported commodity and the setting up of a dealership inevitably requires much more capital than for a small retail shop. In addition, the high purchase costs (which include a substantial import duty) together with low average incomes in this part of Greece means a relatively low demand for them. A concentration of dealers in Athens with branches in the major regional capitals is therefore the main characteristic of the distributive organization. The influence on consumer movements is apparent with a large proportion (49 per cent) outside West Thessaly, mainly to Athens, Larissa and Thessaloniki. The mean distances of movement and the range are the highest of all thirteen goods or services.

FIGURE 7. Movements to an optician



The map showing the pattern of movements (Fig. 8) reflects the aggregated statistics. The fairly well structured patterns that occur with the other goods and services do not apply here where the relevant scale of movements is at a higher level. Trikala and Kardhitsa do act as the foci for some movements, particularly those that originate within their own *nomoi*, but the attraction of the larger centres outside West Thessaly does not show any significant variations within the region. The nature and cost of the purchase means that trips to buy a car are probably single-purpose, and comparative shopping may be a significant feature of consumer behaviour.

conclusion

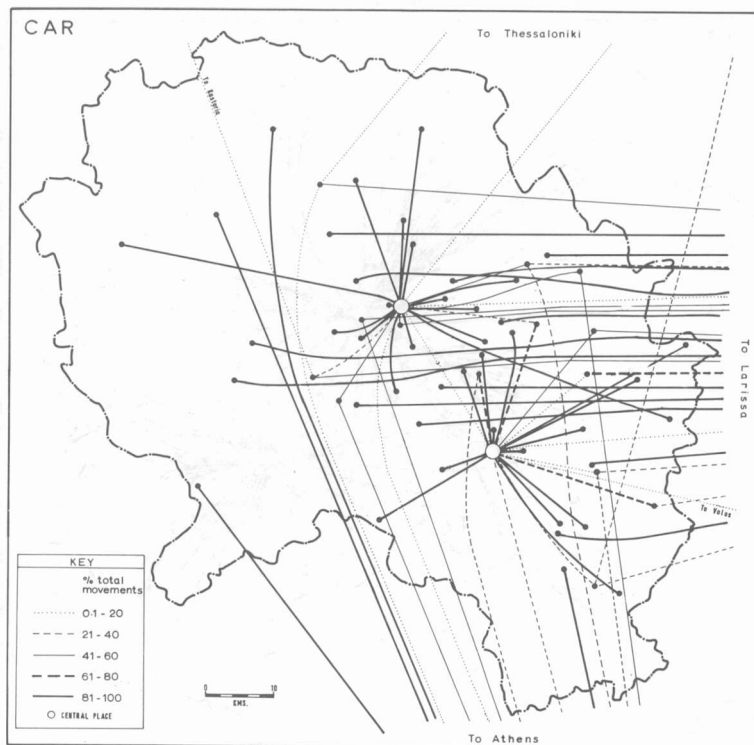
This examination of consumer movements in West Thessaly had the limited aim of giving a broad indica-

tion of the behaviour of the settlement system in the area and, in particular, of the extent to which settlements identified as central places in the structural analysis do in fact act as centres for their surrounding rural populations.

The simple hierarchical structure of the settlement system which was identified appears to be closely paralleled in the functioning of the system since the provision of functions at different hierarchical levels is reflected in different patterns of movements. The *A*-level centres extend their influence throughout their respective *nomoi*, especially in administrative functions but also in high order goods and services. They are not, however, so dominant in lower order functions, and for these their hinterlands are more localized.

The *B*-level settlements are active centres for predominantly mountainous hinterlands. Sofadhes is an important focus for plain villages in the south-

FIGURE 8. Movements for a car



eastern part of Kardhítsa *nomos*, but both Palamas and Farkadon have much more limited spheres of influence. The *B* centres all provide a wide range of goods and services. Their role as weekly market centres may be a vital one in maintaining this position while the absence of change in the organizational structure of retail trade is another factor in its continuation. The existence of credit ties such as Campbell (1964) has described for the Sarakatsan shepherds may be another important element in maintaining the viability of these centres as places for the buying and selling of both agricultural produce and consumer goods and services.

The *C*-level settlements appeared to have a very limited role as central places, particularly in retailing, and this would support the notion that they are relicts of a time when transport within the region was both relatively more expensive and difficult. They do, however, still have significance as local non-retail cen-

tres, especially for local health and administrative functions. On the other hand these functions are not just confined to those settlements specifically identified as *C*-level but are also found in a number of larger *D* settlements, suggesting a blurring of the functional distinction between *C* and *D* level settlements.

Outside West Thessaly Larissa acts as a regional centre for high order goods and services. It is perhaps most important in the fields of administrative and non-retail commercial functions, but it is clear that it acts as a more local *A* type centre for settlements in the extreme east of Trikala *nomos* as well as providing goods and services in a more limited degree to the rest of the western region. Although in proportional terms the number of visits made to Larissa for goods (except Cars) and services was fairly low, its significance as a regional centre should not be underestimated since the types of functions which it provides at this level are not ones

which generate substantial volumes of movement of people; rather, information flows may be more important, and it was not possible to consider these. Volos does not appear to act as an alternative competitive regional centre to Larissa, but its role as the region's port is perhaps complementary to it.

Athens also provides the focus for some movements for all except the lowest order goods. It was suggested that for consumer goods (except Cars) this may largely reflect purchases made in the city while visiting for other purposes. The role of Athens in the provinces is most apparent in its function as the seat of a highly centralized government while in the specific case of the distributive trades it may be more significant in wholesaling and transshipment. Nevertheless, it is conceivable that the value of retail purchases is proportionately greater than the number of purchases recorded and this provides an additional dimension to the dominating position of the city in Greek life.

Classical central place theory predicts a series of discrete nested trade areas. In this study, the existence of nucleated rural settlement as well as the small number of responses from most individual villages does not make it particularly meaningful to produce maps showing precisely defined hinterland boundaries, and the maps of consumer movements are therefore sufficient to compare the patterns of trade areas against those of the theory. For low order goods and non-retail services, the hinterlands of *A* and *B* level centres are very well defined, while for administrative functions they would obviously be clear-cut. Similarly, for goods and services available only in the towns of Trikala and Kardhitsa the pattern of movements to Opticians suggests a fairly well defined division corresponding closely to *nomos* boundaries, although those for Cars showed less ordering since the scale of distribution is more properly national rather than local or even regional. For higher order consumer durables, however, some overlapping of the hinterlands of *B* centres by those of *A* was found, but this may be viewed in terms of interaction theory and Rushton's (1971) concepts on consumer spatial preferences. Even if no attempt has been made here to calibrate a gravity model, visual inspection of the maps of consumer movements would suggest the validity of a probability model such as Huff's (1963) in providing a generalized description of the movements which would be more in accordance with the actual patterns. Rushton's notions regarding consumer spatial behaviour might provide an explanation of the greater importance of *A*-level centres for higher order goods where comparative shopping is more important, while the continued viability of *B*-level centres might be seen in terms of the need to combine normal consumer activity with business connected with agriculture (selling or buying produce, livestock, fertilisers etc.).

Although only rather general conclusions can be reached about the structure and pattern of consumer movements in West Thessaly on the basis of the research so far undertaken, the findings point to some wider practical implications which would merit further investigation. The most obvious use for this kind of research is in the delimitation of urban hinterlands. This should be a necessary prerequisite to the planned introduction of new retail and non-retail service activities since the size of the catchment population will determine the economic viability and size of the establishments. Over a wider region the identification of the network of hinterlands will help to determine the optimum spatial distribution of particular activities on a larger scale. In Greece such information is probably of greatest potential value in assessing locations for government and high-order services since the private, small-scale retailer will most likely continue to operate intuitively. Even if studies of consumer movements on a very wide scale are impractical for these purposes, the use of bus services as a surrogate would be very suitable given the low rate of personal car ownership (e.g. Green 1950, 1951).

There is also a wider value in identifying hinterlands since the state of their economy has a direct bearing on the economic health of the service centre, and changes in the former may have a variety of repercussions on the centre. For example, settlements on the western edge of the plain such as Pili and Mouzakion may see the erosion of their economic base as the depopulation of the mountain areas which they serve continues and attention should therefore be directed now to the kind of activity (such as wood-based industry) which may be able to compensate for this. Conversely, the extension of irrigation and the intensification of agriculture in the plain might be expected primarily to favour the service section of the towns of Trikala and Kardhitsa, and there would therefore be a need to plan for the accommodation of growth in retail or non-retail land uses in these places.

More specific future projections might be made with the retail trade sector where the intensive use made of *B*-level centres for a wide range of consumer goods purchases reflects the traditional structure of retail trade in Greece. The small family-run establishments operating on low turnovers which are the norm allow most goods to be supplied down to low levels in the settlement hierarchy. The corollary, however, is the relatively high unit costs of distribution and a lack of flexibility in the ability of the system to respond to product or marketing innovations. It has been argued elsewhere (Preston 1968, Bennison 1979b) that this is an important factor impeding indigenous industrial development in Greece. At the more local level, however, the significance of this lies in what would happen if changes in retail trade were to occur similar to those of more advanced

economies (primarily the growth of average establishment size and the emergence of the multiple branch firm), especially if there was also a decline in real travel costs and times. The most probable effect would be an increase in the attraction of *A* centres, where larger shops would locate, and a decline in the role played by *B* centres, leading to physical and economic planning repercussions similar to those already mentioned.

While the findings of this study may point to certain conclusions and implications, it needs nevertheless to be emphasized that these must remain somewhat tentative in the absence of more thorough investigation based on detailed questionnaire survey work involving

personal interviews. Such important topics as the social and economic influences on consumer behaviour in Greece, or the accessibility of commercial and social services to rural populations, remain therefore to be examined more deeply. It is hoped, however, that this study may help to provide an appropriate background for relevant research. The need for such research should not be doubted in the light of the great spatial inequalities that exist in Greece and which still require the formulation of effective regional and sub-regional strategies based on a sound understanding of the structural and functional characteristics of provincial economies and settlement systems.

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