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## Resumos

## PREFERENCES AND DEMAND FOR LOCAL PUBLIC GOODS: MISPLACED EMPHASIS? (\*)

*Paulo Trigo Pereira* (\*\*)

This paper is intended to analyse the relevance of the empirical research on the revelation of preferences and demand estimation for «local public goods», according to the processes of decision-making at a local level. Therefore it does not consider normative aspects of optimality and efficiency in the local public sector which have been analysed elsewhere [Rubinfeld (1987) and Wildasin (1987)].

Economists usually accept the postulate of consumer sovereignty in private choices in the market and naturally they are inclined to accept it in public choices as well. However, the provision of «local public goods» is the outcome of local political processes mainly within representative democracies where politicians, bureaucrats and citizens play different roles. This means that the attempt to understand citizens' preferences may be an academic exercise without much practical relevance. This caused a split in the economists' approaches, some following the study of citizens' preferences and demand, others denying its relevance and giving emphasis to «supply-side» factors.

Our approach consists of showing that the central task is not the choice between these fields but to identify the restricted domain where the literature on the revelation of preferences and demand estimation for local public goods is relevant either due to its present importance or to its future (potential) relevance if changes in the nature of local political processes are achieved.

This will be done in four steps. In the first section the nature of «local public goods» is discussed using club goods theory. Section 2 analyses the principal arguments concerning the potential irrelevance or misplaced emphasis of such literature. Section 3 identifies the scope of empirical analysis through a survey of the main methodologies employed to estimate demand and willingness to pay for local public goods. Finally in section 4 the nature of local political processes is considered.

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(\*\*) Lecturer of the Instituto Superior de Economia e Gestão, Academic Visitor at the London School of Economics and Political Science and Research Student at the PSERC (University of Leicester).

## 1 — On the nature of local public goods

Local public goods have been defined <sup>(1)</sup> as public goods (in the sense of nonrivalness of consumption and nonexcludability) in which the spatial benefits of consumption are geographically limited to a community. However there is a major problem with this concept since as far as there are no barriers to enter the community, it is difficult to sustain the assumption of pure nonrivalness of consumption.

The nature of the so-called local public goods has been clarified with the recent development of the theories of club goods and property rights.

If under any arrangement of property rights it is not possible to introduce an exclusion device at a reasonable cost then the local collective good can only be provided publicly or it will not be provided at all.

On the other hand if under some arrangement of property rights, excludability of consumption is possible, then the local collective good may be provided publicly or as a club good. In the former case it is financed through the budget of one or several public agencies and consumed free of direct charge, which mean that the consumer does not make a direct link between benefits and costs. In the latter case an exclusion device is in place and consumption is not free. It must be emphasized that club goods can be supplied under different ownership arrangements: private firms, voluntary associations or cooperatives and public agencies.

To the extent that the consumption of excludable, local collective goods is partially rival, the club good arrangement is appropriate according to the efficiency criterion. Each new member of the club imposes a congestion cost on all others and at the same time gives them a benefit equal to the decrease in the unit cost that they face. The optimal provision of the club is achieved when the marginal benefit of a new member equals the marginal cost <sup>(2)</sup>.

However, if the same collective good is provided publicly rather than through a club, it means that inefficiencies exist. So, public provision can not be justified on efficiency grounds but only according to another ethical criterion, that must be a shared value of the community.

To summarize, within the set of collective goods which share the characteristic of jointness and partial nonrivalness of consumption we can distinguish three situations: *i*) goods nonexcludable according to the actual state of technology (e. g. the reduction of the level of urban air pollution); *ii*) excludable goods that are consumed freely because of the present structure of citizen and property rights, or other ethical reason (e. g. public parks, public education);

*iii*) excludable goods that are partially or totally financed through fees or charges (e. g. municipal swimming-pools, private tennis clubs).

It is important to make clear that the distinction between *ii*) and *iii*) is economic/legal and not technological. This means that any goods in *ii*) can later on belong to *iii*) (and vice-versa) if there is a change in the legal framework. To make this point clear consider a case of a public good (e. g. a public park in a high density urban area) subject to an increased rate of utilization so that it is potentially being degraded. There are only two ways of avoiding the potential «tragedy of the freedom of the commons» <sup>(3)</sup> when the rate of utilization of a local public good increases. One is the self-regulating process to leave congestion itself as a mechanism of autoexclusion of consumption, so that an equilibrium in the rate of utilization is achieved [this means leaving the good in group *ii*)].

However there is no guarantee that this equilibrium in the medium or long term avoids the problem of the tragedy of the commons. The other way is a change in property rights so that an exclusionary device is introduced, i. e. to create a club, which can be provided under different institutional arrangements [this implies that the same good belongs now to *iii*)].

The model of club goods is particularly suitable since it allows as polar cases the pure public good and the private good. Nevertheless the typical case is when there is jointness of consumption, some exclusionary device is in place, and congestion increases with number of club members (after some rate of utilization is achieved). As we will see later on, congestion is a central issue when discussing the nature of local public goods.

If we return now to the problem of the relevance of the literature in the revelation of preferences and demand for «local public goods» we can see that as far as they can be considered club goods there is no problem of preference revelation. Citizens will reveal their preferences by joining the different clubs or not. Nevertheless the relevance of the theory remains for such cases where «local public goods» are provided at a zero price, either because there is no feasible mechanism of exclusion or due to some normative criterion (other than efficiency).

There are other reasons which justify some scepticism about the relevance of this theory, which are mainly related to the supply side of the problem, as we will see in the text next section.

## 2 — Demand or supply of public goods?

Decision-making regarding the supply of local public goods is carried out within local political processes, and the pertinent question that has been analysed is whether these processes are likely to be affected by local citizens' demands,

<sup>(1)</sup> See for instance Atkinson and Stiglitz (1980), chapter 17.

<sup>(2)</sup> We are making reference to «within-club» optimality which was initially formalized in Buchanan's paper (1965). Further developments consider optimality from a total-economy point of view. For a good review of this analysis and of club goods' theory see Cornes and Sandler (1986).

<sup>(3)</sup> This «tragedy» means that there is an overexploitation of a scarce resource, when there is not a rent imputable to its use. There is a vast literature on the subject started by the article of Garrett Hardin in *Science*, 162 (1968), pp. 1243-1248. For a formalization of the problem see for instance Cornes and Sandler (1983).

or are they more influenced by the preferences of specific interest groups or the preferences of the politicians and bureaucrats.

Johansen (1977, 1981) pointed out that there is no empirical evidence to support the relevance of the preference revelation issue in actual political processes and that there is a misplaced emphasis on the direction taken by the more sophisticated strand of this literature.

Recent developments of positive public choice or public choice in representative democracies<sup>(1)</sup> has stressed the restricted role of citizens in affecting the outcome of the political process. The earlier public choice model of the median voter, which accentuates the role of this voter in determining the shape of fiscal policies, has been abandoned by leading scholars in the field [e. g. Brennan and Buchanan (1980)] or integrated into other models [Niskanen (1972) and Romer and Rosenthal (1979b)] to show the ability of politicians and bureaucrats to manipulate budgets even if they are "constrained" by referenda, since asymmetrical information distribution enables them to set the agenda according to their preferences.

As a consequence of the difficulty of setting appropriate tests of these "supply side" hypotheses, empirical evidence is not conclusive in supporting or rejecting them<sup>(2)</sup>.

When considering the expenditures of local governments it is possible that supply or demand considerations are dominant in explaining different parts of the local budget. For instance, it is plausible that wages expenditures on municipal public employees is better explained by the specific interests of civil service unions (that influence the wage structure) and the local politicians (that determine the employment structure within the hierarchy)<sup>(3)</sup>. On the other hand capital expenditures on local schools may be better explained by demand factors.

This suggests that the relevance of the literature on preference revelation and demand for local public goods is restricted to a certain domain. This actual narrow domain of social choice can be enlarged if changes in institutions and procedures of decision-making are implemented. It is in this context that Bohm (1979, 1984) suggests that given the present institutions of the two-tier system of the democratic process, there is not much scope for applying the results of the preference revelation literature. However he outlines the role of the economists, as "exploring ways of implementing a process of 'direct democracy' for certain issues". We will deal with this problem in the fourth section.

Before this, we are going to analyse the main empirical approaches to demand revelation for local public goods, paying special attention to the domains in which they are applied.

<sup>(1)</sup> The best survey of Public and Social Choice is Mueller (1989).

<sup>(2)</sup> Pereira (1990) shows that the Leviathan hypothesis developed by Brennan and Buchanan was not really tested, in spite of some attempts to do it.

<sup>(3)</sup> In this context see Courant, Gramlich and Rubinfeld (1979).

### 3 — Empirical estimates of demand and willingness to pay for local public goods

There are four main methodologies which have been used to estimate demand functions or willingness to pay for specific public goods. The median voter model which uses quantitative and qualitative aggregate data, the contingent valuation method which employs survey data on subjective preferences and, employing market data, the hedonic and travel-cost approaches.

#### 3.1 — The median voter approach

By far the most used method has been the median voter model which is sometimes improperly called a voting method. The typical approach uses cross-section data on expenditures from local governments and regresses it against the income and tax-price of the median-voter and other socio-demographic variables which distinguish the several jurisdictions. If we disregard the supply-side criticisms to this model that we alluded to earlier, there remain two major problems: the domain of application and the variables used.

The median voter is decisive in a process of social choice under simple majority rule when preferences are single-peaked and the choice is over one issue only (unidimensional). This last assumption is violated in all empirical studies that use data from budgets of plurifunctional local governments, because as budgets are approved, all items of expenditure are settled simultaneously. As Romer and Rosenthal (1979a) stated, the only institutional context which approximately satisfies such an assumption is school expenditures when education is the only public good provided by the local agency.

Regarding the choice of the variables the main problems are the use of expenditures as a proxy for demand, which has been correctly criticized by several authors, and the selection of the tax-price variable.

In spite of all these problems, the median voter model has been widely applied due to the availability of cross-section data and, in the opinion of some scholars, the lack of a better alternative model<sup>(4)</sup>.

The main results of the empirical literature using the median voter model, are consistent with the theory regarding the sign of the demand elasticities. Published results show generally positive income elasticities and negative price elasticities. However these estimates diverge considerably according to different specifications of the demand function and the data used as indicators of the variables, particularly the specification of the tax-price variable as a major effect on the value of the price elasticity<sup>(5)</sup>.

<sup>(4)</sup> We are rather sceptic about the argument: "absence of a better alternative" as the core argument in supporting the empirical use of a model.

<sup>(5)</sup> Wildasin (1989) shows that the tax-price variable is misspecified when public goods are financed through distortionary taxation. This originates biased estimates of price and income elasticities of demand. R. Crane (1990) also considers the same problem emphasizing the capitalization of local services into house values.

Another important result of this literature is the estimate of the «crowding» or «congestion» parameter. It gives an indication of the degree of publicness of the local public goods, and estimates suggest a high degree of congestion, even if it changes according to the particular local public service studied. Acceptance of these results led several authors [Bergstrom and Goodman (1973)] to question the nature of these goods, namely if they should remain in the public sector. A stronger interpretation regards these estimates as supporting the approaches which emphasise the role of politicians and bureaucrats [Niskanen (1975); Borcherding, Bush and Spann (1977)]. On the other hand, authors more sympathetic to a public provision of local services argue either that there is an upward bias on the estimates of congestion [Oates (1988), McMillan (1989)] or that greater estimates of the degree of publicness than the ones obtained from the traditional demand approach [Brueckner (1981)] can be obtained by using other measures of output.

What this discussion about the congestion parameter illustrates is that it is difficult, if not impossible, to derive from the results of the empirical research conclusive statements about the nature of «local public goods».

### 3.2 — The use of qualitative surveys

The problems with the median voter model and the fact that it applies only to actually provided public goods led to the development of different approaches, namely the use of qualitative surveys.

Micro-data obtained in the surveys gives information on household demand for local public goods, which is distinct from the aggregate data used in the median voter model.

The paper of Bergstrom, Rubinfeld and Shapiro (1982) is the first estimate of demand functions for local public goods from survey data. It uses information about the level of public expenditures on local schools related to the willingness to pay taxes to finance it. Their results, replicated in another article [Rubinfeld and Shapiro (1989)] show some consistency with the results obtained from the median voter model, however they obtain lower estimates of income and price elasticities of demand.

The same type of data has been used by other authors [Ferris (1983), Schokkaert (1987)] in another context and they also accentuate the importance of «sociological variables» (e. g. age, sex, education) in the explanation of the willingness to pay for specific public projects.

The survey method has also been applied to value environmental commodities in what is known as contingent valuation techniques [Brookshire *et al.* (1982)]. The idea of this method is to construct a hypothetical or contingent market of a non-marketed good, in which for alternative levels of the public good (or bad) the respondents must state their willingness to pay (or required compensation). Such a procedure enables a measure of consumer surplus for

each individual to be derived, which can be aggregated to obtain a «market demand». This approach seems to be quite useful to appraise benefits in a cost-benefit analysis of a public project where most of the benefits do not have a direct relation with market variables.

However, there are several biases which may be present, and that may affect the results. Cornes and Sandler (1986) identify three: the problem of strategic behaviour (misrepresentation of preferences), the kind of information given to the respondent about the contingent market and the design of the survey (namely the levels of payment suggested).

The first problem is common to all the processes which try to elicit preferences for public goods. The real importance of this bias has been extensively discussed in the literature<sup>(v)</sup> and experimental tests are not conclusive about the real importance of the free-rider behaviour.

Nevertheless what intuition suggests, if we assume self-interest respondents, is that there is a trade-off between strategic and «random» responses. In fact, if the nature of the subject of the questions is quite hypothetical (respondents will not be affected by the outcome of the survey/game), less strategic behaviour will be expected at a cost of more «randomness» in the answers. On the other hand, involved surveys or experiments in which the respondents will be affected by the outcome of the survey/game (either because they may receive direct cash payoffs, or they will be strongly affected by the approval of a public project, which will be decided by the outcome of the survey) will give strong incentives to try to behave strategically<sup>(vi)</sup>.

### 3.3 — The indirect or market data approach

If the consumption of private goods is associated with the consumption of local public goods, then the demand for the latter can be evaluated through the demand for former. This indirect approach uses market data on private goods, and two methods have been used: the hedonic and travel-cost methods<sup>(vii)</sup>.

The hedonic method uses mainly data on property values and assumes that they reflect household, neighbourhood and accessibility attributes as well as one public characteristic (e. g. pollution level or social infrastructure). Making the housing prices a function of these variables, it is possible to estimate an implicit price of the public characteristic. This implicit price is then regressed against the observed quantities of such a public good to estimate the demand function.

<sup>(v)</sup> The classical 1954 paper of Samuelson in the *Review of Economics and Statistics* (36), which stated the free-rider problem and its consequences to the non-optimality in the provision of public goods, has given rise to a plethora of more than one hundred papers.

<sup>(vi)</sup> Bohm (1979) and Brookshire *et al.* (1982) also pointed out these problems.

<sup>(vii)</sup> On the Hedonic Approach see Brookshire *et al.* (1982) and many other articles in the *Journal of Environmental Economics and Management*. On the travel-cost approach see for instance Smith, Desvousges and McGivney (1983).

The travel-cost approach emphasises that the use of a particular public facility implies travel from the household home to the specific site where this facility is located. So, the individual demand for an existent local public good in a particular location can be analysed as a function of the distance, unit travel cost, travel time, entrance toll (if it exists), the characteristics of the public good and the income of the individual.

### 3.4 Synopsis

The research agenda, on the estimation of demand functions for «public goods» using the median voter model started nearly two decades ago. At that time the hopes were great: «1. Prediction of the outcomes of alternative political decision methods ... 2. Computation of tax structures and expenditure levels which satisfy certain preference-based normative criteria ... 3. Investigation of whether there are 'economies of scale' to city size in the production of public services ... 4. Prediction of the effects of projected changes in values of economic and demographic variables on quantities of the public goods to be supplied.» (Bergstrom and Goodman 1973, p. 280.) The confidence was also great since the median voter model seemed to be theoretically robust and was going to replace ad hoc assumptions which were dominant in the empirical studies at that time.

The seventies saw a proliferation of articles applying the model, but at the end of the decade the important paper of Romer and Rosenthal (1979a) clarified the limits of its application. At the same time, leading public choice scholars started to support the idea that local politics could not be explained by the median voter model.

This gave rise to a stream of literature emphasising supply-side considerations. Both this new trend in the literature and the fact that the empirical results using the median voter model fall short of the initial expectations led to two major consequences in empirical research. Firstly the domain in which the median voter model has been applied in the eighties was drastically reduced. Secondly different methodologies were developed with rather more modest aims. As we saw earlier, for example, the contingent valuation method, is not used to estimate demand functions but for the much more limited aim of estimating the aggregate willingness to pay for a specific public good, that can be used in a cost-benefit analysis.

## 4 — The domain of local collective choice and the nature of the political process

### 4.1 — Some pertinent problems

The problem of knowing if there is a misplaced emphasis in the literature on preference revelation and demand estimation for local public goods can be split into three main problems: how are actual decision-making processes on the

supply of local public goods affected by citizens' preferences? What should be the domain of collective choice at a local level? What kind of changes in rule and institutions could be introduced in order to increase the weight of citizens' preferences on the relevant domain of local collective decision-making<sup>(17)</sup>?

The answer to the first question depends crucially on the way economist model local governments behaviour, in other words the way they consider the relationship with decision-makers and citizens. There are implicit and explicit hypotheses concerning this problem but there is seldom any empirical evidence to support (or reject) them.

The welfare economist who implicitly assumes a benevolent local government, in the sense that it wants to satisfy citizens' preferences, sees his essential role as knowing these preferences through mechanisms of incentive: which enable him to derive non-biased («honest») preferences<sup>(18)</sup>.

The welfare economist who uses the former public choice model of the median voter as an explanation for local governments behaviour, namely to explain the outcome of the political competition at a local level, also gives a great importance to understanding citizens' preferences, in particular those of the median voter.

On the other hand political economists who emphasize supply-side considerations, namely those who work with the Leviathan model of government are rather pessimistic about the efficacy of voice (i. e. migration or «voting with the feet») as a means of constraining Leviathan proclivities<sup>(19)</sup>.

Different economists' standpoints allow for divergent considerations of the practical importance of the problem of preference revelation, i. e. its relevance according to the actual context of local political decision-making.

Unfortunately, there are few empirical studies which deal with this problem. In so far as empirical evidence does not play a role in this issue, we can argue that demand considerations are important in setting the levels of provision of certain «local public goods», but are irrelevant in others. The traditional welfare economist seems to be naive about his consideration of the nature of local

(17) Another important problem, not discussed in this paper, is to know who are the citizens that should participate in the process of local collective choice.

If each public agency provided one local public good with autonomous sources of revenue and if the boundaries of the spatial pattern of benefits of the public good were the same as the limits of the political jurisdictions, there was no major problem. Each citizen-taxpayer-beneficiary of a given community was able to vote on a bundle of public good/tax rates, that will be provided and financed by the members of the community. However the situation is far more complex as the literature on fiscal federalism has shown us. The rule more than the exception is the existence of «spillovers» between neighbouring communities so that citizens from one jurisdiction can impose costs and/or benefits on adjacent communities. In the case of a spillover of benefits the equilibrium level of output arising from the median voter of the jurisdiction is lower than the one achieved with all beneficiaries of the local public good. The proposed solution is the same, as when we have positive externalities, the Pigouvian subsidy being replaced by a matching grant.

(18) The leading scholars in this approach are Green and Laffont. See their *Incentives in Public Decision-making* (North-Holland, Amsterdam, 1979) and its review by Johansen (1981).

(19) The importance of voice and exit in this context is well discussed in Wiseman (1990).

political processes. On the other hand «supply-side» political economists throw the baby out with the bath water when they say that local politics can not be reduced to the satisfaction of citizens' preferences and so they make the further step of denying the relevance of the problem of preference revelation.

A more fruitful approach seems to be to identify the domain in which local decision-making is affected by citizens' preferences, and the one where politicians and bureaucrats' preferences over rule them. In the former case demand driven hypotheses might have a great explanatory power and the role of the welfare economist may be greater. The use of methods such as those surveyed in section 3 are more justified. In the latter case supply-side hypotheses might be more accurate and the role of the political economist enhanced.

#### 4.2 — The domain of local collective decision-making

We turn now to the normative problem of knowing what should be the domain of local collective decision-making.

Our discussion in section 1 on the nature of «local public goods» provides a framework to discuss the problem. If we allow changes in property rights, there are few goods which have partial non-rivalness of consumption, to which an exclusion device can not be introduced. So there is a choice to be made between public provision and club provision. The club provision may be efficient with the appropriate choice of optimal fees. However equity issues may arise namely if a change on property rights is needed to create the club. The public provision option must be based mainly on ethical grounds, taking account of the trade-off between equity and efficiency.

#### 4.3 — A dynamic approach to rules and institutions

Our last problem is that of knowing whether the economist must accept as a datum the two-tier institutional framework with the present rules of decision-making or whether it is also the «role» of the economist to analyse and suggest improvements on rules and institutions. The two approaches have been practiced by different economists and they reflect different conceptions about the relationship between the economist, the policy-makers and the citizens. Both have arguments in their support and the choice has been a matter of taste.

In considering a dynamic approach to the actual institutional frameworks, and accepting even with some reservations the postulate of consumer sovereignty, we must conclude that citizens' preferences should play a greater role in local decision-making. This can be achieved in two different ways: improving the «performance» of representative democracies, and extending the domain of «direct democracy».

If we «measure» the performance of representative democracies by their ability to satisfy the preferences of the median voter, we can identify easily two factors responsible for a poor performance. One is the degree of existing barrier to local political competition, which restrain the number of political parties, and consequently the diversity of the agenda laid before the electorate. The smaller the number of proposals, the smaller is the probability that the median voter's preference is included in a proposal. The second factor is the obstacles to accessing the relevant information on the provision and financing of local public goods.

This suggests that changes to rules regulating these and other aspects of local political processes may improve their outcome, measured by the ability citizens have to express their «voice».

The fact that representative democracies are clearly dominant as a framework within which collective choices at a local level are made suggests that they may have some qualities which show their superiority towards «direct democracy». It is not necessary to be an institutional Darwinist like Hayek to support this point of view. We may consider the theory of rational voter ignorance of Downs (1957), and the transaction-cost approach of Buchanan and Tullock (1962) as positive explanations of why direct democracy in all issues would be at the same time impracticable and undesirable.

Nevertheless, this does not rule out the introduction of some change to the rules of decision-making and the use of «direct democracy» procedures (as referenda) to make decisions on some specific issues. It can be argued for example, that decision-making which involves a major change to property rights must in advance be submitted to a referendum, when this change involves the loss of rights of a great number of citizens. Usually this is done under a modification of the Pareto principle according to which, if compensation is paid to the losers, then in the end all will be better off. This utilitarian calculus, which is frequently made by local governments, may violate citizens' preferences. They may prefer not to be compensated, and keep their initial rights, and a way to make this clear is through a referendum.

### 5 — Conclusion

The relevance of the empirical research on the revelation of preferences and demand estimation for «local public goods» is restricted by three interrelated factors: *i*) their nature; *ii*) The relative domain where supply-side hypotheses are accurate in explaining public provision, and *iii*) the characteristics of the local political processes.

Under the label «local public goods» are in fact two sets of goods. Firstly there are those which (according to the actual state of technology) under any arrangement of property rights, no mechanism of exclusion can be introduced

at a reasonable cost. Consequently they will be provided publicly or not at all. Secondly there are those which according to the arrangement of property rights can be provided publicly or as club goods. The efficiency criterion supports the club good arrangement, so the public provision option must be grounded on other ethical values shared by the community.

Empirical research has shown some presumption in favour of the «private» nature of «local public goods», even if it is not very conclusive since some biases were detected, and their correction increases the degree of publicness of those goods.

The scope of empirical research was greatly reduced in the eighties not only in terms of the local goods under analysis but also the kind of institutional frameworks where data was collected. The median voter model has been much less applied, and on the other hand alternative methodologies (survey techniques like the contingent valuation method, and market data techniques like the hedonic approach) have been developed to apply to the limited range of «local public goods» where no excludability of consumption is possible (e. g. environmental goods).

Economists studying the demand and willingness to pay for «local public goods» assume the present or future relevance of preferences and demand factors on the public provision of these goods. On the other hand political economists emphasise supply-side considerations, and deny partially or totally the relevance of that literature. We argue that both perspectives are relevant in different domains of local collective choice.

Finally, the relative importance of these domains depend crucially on the nature of the local political process. Increasing «citizens' sovereignty» implies the improvement of the political competition in representative democracies and the introduction of some «direct democracy» mechanisms.

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