

Group Purchasing Classification – Symbiotic Relationships in Horizontal Purchasing Cooperation

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Summary

Group purchasing cooperation can be beneficial for all parties involved. The gains are, however, not always fairly distributed amongst the participants. This puts a strain on the relationships within some forms of cooperation. Schotanus and Telgen (2005) have developed a classification model, the highway matrix, which makes a distinction between five forms of horizontal cooperations. This matrix distinguishes two factors to classify these cooperations, namely: the intensiveness for the members and number of different activities for the initiative. This matrix has been taken, because it is the most extensive classification tool that covers all possible forms of horizontal cooperations. This paper extends the highway matrix to incorporate the relationships between the parties involved, by adding a 'symbiosis dimension'. This new classification tool, the extended highway matrix, assists purchasing cooperations, in the way how they should manage their relationship. More specifically, it provides information about the necessity for an allocation mechanism for gain distribution. It does not, however, provide information about the real distribution of gains. For more information about gain distribution the reader is referred to literature of Heijboer (2003) or Schotanus et al. (2006). This paper shows a re-analysis of 51 previously published case studies of group purchasing, which provides initial support for the new symbiosis dimension in the 'extended highway matrix'. Based on the analyzed cases it can be concluded that some forms of group purchasing have no need for a special allocation mechanism for gain distribution, whereas others do in order to run the group successfully.

Keywords: group purchasing, purchasing consortium, classification, symbiotic relationships, allocation

Introduction

Many terms can be used to refer to group purchasing, e.g. horizontal, consortium, collaborative, collective, combined, joint, pooled, shared, bundled or mutual purchasing, procurement, sourcing or buying (Schotanus & Telgen 2005) and terminology has yet to be fully stabilized (Kivisto et al. 2003). We use the following definition of group purchasing: horizontal cooperation between independent organizations that pool their purchasing activities in order to achieve various benefits.

Group purchasing distinguishes itself from other forms of cooperation – as buyer-supplier alliances or joint ventures – by among other things the following characteristics: a large possible number of group members, large possible dissimilarities between group members, different cooperative product and service groups and related life cycles, and the specific purchasing perspective in stead of for instance a technological perspective (Schotanus & Telgen 2005).

Group purchasing provides an opportunity for businesses and organizations to realize considerable benefits on purchasing. In some sectors the concept of group purchasing has been used intensively and has been proven to be beneficial. Examples of such sectors are the health sector in the U.S. (The Lewin Group 2002), and the higher education and library sectors in the U.S., U.K., and Australia respectively (Walker et al. 2006). However, it is currently not common practice in many other sectors.

Companies involved in group purchasing usually expect to realize amongst others price reductions, lower transaction costs, lower management costs, increased flexibility of inventories, lower logistics costs, and sharing of information (e.g. Tella & Virolainen 2005). To be able to achieve different benefits of group purchasing in different situations different forms of group purchasing have emerged (Arnold 1996).

To be able to assess the potential of different forms of group purchasing, a classification is required. When considering different forms of cooperation it is necessary to make a clear distinction between these forms, because critical success factors, advantages, disadvantages, savings allocation mechanisms, and other managerial implications may differ per form (Schotanus & Telgen 2005). When building a classification a comparative assessment needs to be made between the number of classification factors, the simplicity, and the applicability of the classification. A limited number of factors has a positive effect on the simplicity and general applicability, while it has a negative effect on the applicability for specific situations.

Existing research (e.g. Aylesworth 2003; Essig 2000; Nollet & Beaulieu 2003) hardly touches the topic of classifying group purchasing to be able to assess the applicability and potential benefits and costs of different forms (Schotanus & Telgen 2005). In general, group purchasing has only attracted limited attention from scholars, despite the growth of different purchasing groups in practice. Schotanus & Telgen (2005) have conducted research on group purchasing situations in order to come to a classification of the different forms of cooperation. In their paper they have made a classification tool: the highway matrix. This classification tool makes a distinction between the different forms of horizontal purchasing cooperation while using a limited number of factors. This classification can only be used for general applications and provides only first directions for the strategy of a purchasing group. For specific purposes, the two dimensions can be extended with a third to refine the classification.

The distribution of gains within a purchasing group is not always perceived as fair by the participants. In a large cooperation, for instance, a smaller party has relatively large gains, because it capitalizes on the larger buying power of the other larger parties. This may put a strain on the relationships within the cooperation. For a purchasing manager it is useful to be able to assess the fairness of the distribution of gains and thus also knowing whether strains on the relationship are likely to occur. Further refinement of the matrix could be made possible by adapting the existing two factors or by introducing a third factor (Schotanus & Telgen 2005).

The third proposed factor to extend the highway matrix with is one that deals with the possible costs and benefits of intra-cooperation relationships. Relationships within a cooperation are an important factor for the success of different types of purchasing groups. A relationship contains information about the different roles the parties play in a purchasing group. There are many factors influencing these roles and the

highway matrix mainly covers these factors. However, the highway matrix only implicitly considers the possible benefits and costs of the relationships between cooperating parties for different forms of group purchasing. The contribution of the third factor dealing with the intra-cooperation relationships, as we use it in this paper, lies in the fact that it provides information about the distribution of gains within the different forms of purchasing groups. It can thereby be seen as a proxy for the stability of the relationships within that group, because an unfair distribution puts strains on the relationships. With this information representatives of the purchasing group are able to prevent the unfair distribution of gains and instability. They may decide to enforce existing allocation and control mechanisms as are already discussed in literature (e.g. Heijboer 2003; Schotanus et al. 2006).

Thus, existing classifications fall short in their assessment of the distribution of gains for different forms of group purchasing organizations. In this paper a three-dimensional classification matrix is developed and used to classify group purchasing organizations on the basis of the highway matrix and the distribution of gains. The main question is how the proposed extension of the highway matrix can help to increase its usefulness in determining the way to manage the relationships between involved parties and more specifically the distribution of gains?

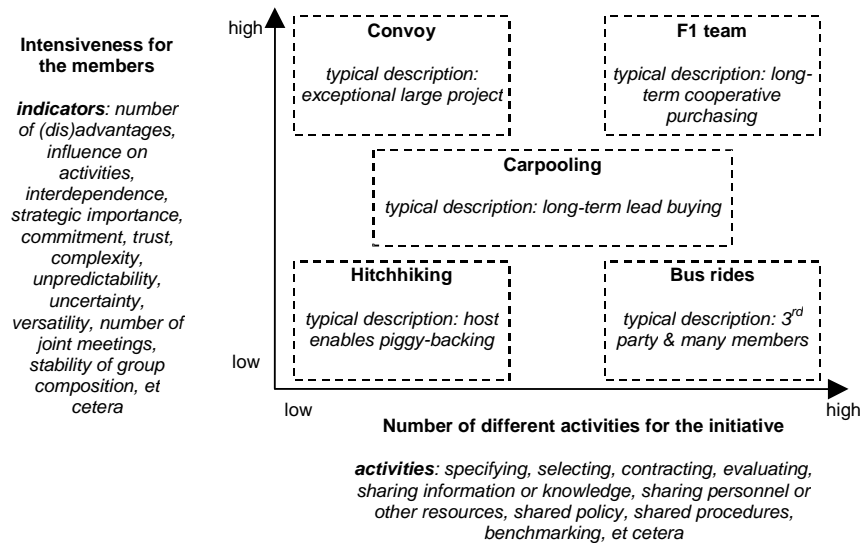
First, we review several existing approaches and theoretical perspectives for classifying group purchasing. The highway matrix developed by Schotanus & Telgen (2005), showing five forms of group purchasing, is chosen as a base classification model. This classification model is then extended to a three-dimensional classification model using analogies from symbiotic relationships in biology. Every type of cooperation in the extended highway matrix has been appointed an assumed appropriate symbiosis dimension. Next, 51 cases on horizontal group purchasing from 23 different papers in literature are analyzed to find support for the corresponding symbiosis dimensions of the different forms of cooperation. The empirical data provide support for the dimensions and operationalization of the new classification model.

Conceptual Results

The highway matrix developed by Schotanus & Telgen (2005) is a model that defines forms of cooperation by considering two factors: “intensiveness for the members” and “number of different activities for the initiative” (see figure 1). The first factor, the “intensiveness for the members”, is defined as the extent to which an organization is compelled to perform an active role in the cooperative initiative. The higher or lower the intensiveness, the more the organizational form leans to coordination by hierarchy to respectively coordination by market (Williamson 2000). The second factor the “number of different activities for the initiative” ranges from undertaking “one occasional cooperative activity” to “continuously undertaking different activities within the same cooperative initiative”.

Five forms follow from the matrix. Firstly, hitchhiking is a form of cooperation in which usually a large organization contracts a supplier and smaller parties are allowed to hitchhike on these contracts hereby increasing their purchasing volume and enabling piggy-backing. Secondly, bus rides usually involve long-term hitchhiking made possible by a third public or private party or central authorities. Members of the purchasing group usually have to pay an annual subscription fee. The number of participants can be very large. Thirdly, carpooling is a form of cooperation characterized by long-term lead-buying. All members of the purchasing group usually have committed staffs that are specialized in purchasing certain commodities for the group. An inherent risk is the dependence on the skills and knowledge of other parties. Fourthly, a convoy is an intensive form of cooperation with a limited number of different activities and is best explained as a one-time shared exceptionally large project. Fifthly, an F1 team involves an intensive cooperation for different cooperative projects. Representatives of the management teams of the cooperating organizations meet on a regular basis in a steering committee to discuss different projects (Schotanus & Telgen 2005).

Figure 1: The highway matrix



Using biology to extend the matrix

We extend the highway matrix with a third factor about the types of relationships within a purchasing group. Our proposed extension uses classifications of potential benefits and costs within symbiotic relationships in the field of biology. The biology perspective has been chosen because much research in this area on the subject of relationships among species has already been performed.

As in nature, organizations have to deal with other organizations everyday. If two or more organizations decide to cooperate by means of a purchasing group, analogous symbiotic relationships from nature can be applied. The relationships between species in nature are analogous to the ones in business where organizations represent organisms and society represents nature (Essig 2000).

In biology, a symbiotic relationship refers to an interaction between two living organisms that live in an intimate association. The ‘populations’ are limited to two types (the term ‘host’ is used for the largest organism, the smaller member is called the symbiont, if applicable) and the results are operationalized as positive (+), negative (-) or neutral (0). The various forms of symbiosis include: mutualism (+,+), commensalism (+,0), parasitism (+,-), amensalism (0,-) and neutralism (0,0). However, the analogy with group purchasing is assumed to hold only for the first three forms of symbiosis, since, at least one party should be able to benefit by cooperating. Otherwise, it is assumed that the cooperation is terminated, which is plausible since none of the organizations is experiencing any benefits from it.

The level of analysis is the level of the purchasing group. It is noticed that this is a generalization and that the outcome of the analysis may differ for individual organizations, departments, individuals working for the organization, etcetera.

It is assumed that a purchasing group is furthermore considered a mutualistic form if and only if all parties experience a positive effect. If at least one party experiences a neutral effect than the purchasing group is labelled commensalism; if at least one party experiences a negative effect than the group is labelled parasitism. When determining the symbiosis dimension we take into account all the different types of benefits applicable to the purchasing group.

Considering the different forms of cooperation mentioned in the highway matrix some remarks have to be made in the context of symbiosis. Hitchhiking, as a form of cooperation is in origin a form of parasitism, because hitchhiking mostly involves small parties hitchhiking on contracts of one large organization, the host. Schotanus & Telgen (2005) already discussed the hitchhiking problem in this context. Furthermore,

bus rides are originally also a form of parasitism, because bus rides involve long term hitchhiking made possible by a third public or private party or central authorities.

In practice we expect allocation mechanisms and control mechanisms to solve for the problems that may arise from piggy-backing in the case of bus rides, but not for hitchhiking. Since hitchhiking usually neither involves a long-term cooperation nor many cooperative activities, allocation and control mechanisms seem to be too complicated and drastic measures for this form of cooperation. I.e., hitchhikers usually do not pay for a pick-up. Note however that there might be some intangible benefits for the organization which carries out the role of the host. This hosting organization might improve for instance its reputation. So, not in all cases the hitchhiking relationship can be classified easily as parasitism. Still, in general we assume that hitchhiking can be considered as parasitism.

In the case of bus rides the cooperative activities undertaken by the purchasing group are based on a longer time horizon such that appropriate allocation and control mechanisms can be installed. Another solution to prevent free riding is that members have to pay an annual subscription fee to ride the bus. In this way bus rides that originally are of a parasitism kind evolve to a commensalistic or a mutualistic type of cooperation.

Other forms such as carpooling and F1 teams are of a different nature and are expected to be of at least a commensalistic or even a mutualistic kind. Members cooperate more closely and intensively than in the case of hitchhiking and bus rides. This leaves no room for parasites in the long run. It is noted that both carpooling and F1 teams sometimes allow hitchhiking on their cooperative contracts for other organizations (Schotanus & Telgen 2005). This can be considered as a separate form of cooperation. Thus, these kind of cooperative initiatives are sometimes a form of carpooling and sometimes a form of hitchhiking.

A convoy is as well an intensive form of cooperation. Schotanus & Telgen (2005) mention an example, OT2000, where the free-rider problem has been present and hitchhikers on the contract did profit from the convoy, but the organizations which actually carried out the tender did not. The possibility for this to happen lies in the nature of the form of cooperation. Convoys are often one-time cooperations and this increases the risk of parasitism by hitchhiking parties. Therefore, parasitism as a symbiosis dimension is also expected besides commensalism and mutualism for this form of cooperation (see table 1).

Table 1: Assumed Dimensions

Type of Cooperation	Mutualism	Commensalism	Parasitism
Hitchhiking			x
Carpooling	x	x	
Bus rides	x	x	
Convoy	x	x	x
F1-team	x	x	

To our knowledge, the application of the highway matrix or other classifications has not yet been empirically tested. Some authors even indicated that because they did not take into account a classification of group purchasing their results fell short of their expectations (Long & Marquis 1999). Therefore, in this paper the highway matrix is tested together with the assumed dimensions.

Empirical Study

In order to find support for the actual occurrence in practice of the expected symbiosis dimensions as presented in table 1, 51 cases of group purchasing have been classified for this purpose. These 51 cases have been obtained from 23 different papers in which the object of analysis is a group purchasing situation. Note that we have discarded 17 cases of a total of 68 analyzed cases, because of lack of information to classify them appropriately. Again, this emphasizes the importance of using a classification.

The selected cases provided enough information to classify them according to the highway matrix. This means the cases provided information about the way the group purchasing organization is structured. The most important aspect for the selection has been information about the realized and or (future) potential benefits for the group purchasing members.

Authors of the analyzed papers include deputies of group purchasing organizations and the CEO of the Massachusetts Higher Education Consortium, researchers in the field of group purchasing and healthcare policy research and management consulting firms.

All the group purchasing situations have been classified according to the highway matrix. Furthermore, all cases have been appointed a symbiosis dimension, which is considered most appropriate. At least one and mostly two of the authors of this paper carried out the classification. The classification was always done by an author(s) who had sufficient knowledge about the concerning case. Minor differences of opinion regarding some case classifications were discussed and taking into account for all of the other cases. In the end, all the authors of this paper agreed upon the classifications.

An overview of the classification and other additional information of the analyzed cases are presented in the appendix. The choices for the symbiosis dimensions are based on what benefits have been reported for the different cases. Benefits not only include financial benefits such as price reductions and lowered transaction costs, but they also include the ability to outsource the negotiation and contracting to a third party, who has or has not have expert knowledge about a certain industry, increased attention of suppliers, sharing inventories, and sharing information and knowledge.

The annual financial savings that have been reported range from five (during the start-up phase) up to thirty percent realized by members of group purchasing organizations (Johnson 1999; Hendrick 1997). Since every dollar savings on purchasing contributes directly to the bottom line of a company's income statement group purchasing is attractive.

A small survey has been conducted among the authors of the papers. Ten authors have been contacted and four of them have responded and filled out the survey. They have been asked to classify the cases they have discussed in their papers for the symbiosis dimension. All these authors classified their cases the same way we did. In addition, the reactions of the authors have provided us with other perspectives on group purchasing organizations and ideas for future research. This will be presented in the discussion section.

Empirical Results

The results of the classification of the 51 cases are presented in table 2. It may be concluded that hitchhiking is indeed a form of parasitism as expected. All four cases of parasitism have reported parties to piggy-back on the contracts. Not many cases have been found in literature that describes group purchasing organizations as forms of hitchhiking. Due to their parasitism kind these groups usually do not last long and are therefore not very common and difficult to study.

Although some cases are classified as commensalism for carpooling, carpooling is found to be a pure form of mutualism in the analyzed cases. The reason commensalism does occur four times is that due to a lack of information it did not become clear whether indeed all parties benefited. These have been indicated commensalism as well as mutualism in the table below. Reasons for the fact that we did not found clear cases of commensalism could be the level of involvement of all of the cooperating parties and a social control mechanism.

Bus rides are two third of the time a form of commensalism and one third of the time mutualism in the analyzed cases. Reasons for this can be that bus rides involve many members and many activities. Thus it becomes unlikelier that all parties will benefit. Furthermore, some of the third parties that actually carry out the tenders are non-profit organizations and do not profit from group purchasing. Although it does provide their right to exist. Also, allocation mechanisms may not be sufficiently introduced to distribute gains of the group fairly.

Convoys are not a common form of cooperation and often only exist for a limited period. Therefore not many are found in practice. As indicated by the table a convoy can be of every dimension. Since convoys are one-time exceptionally large projects the risks of piggy-backing increases.

F1-teams are a form of pure mutualism. Reasons for this are the same as for carpooling.

Table 2: Cross-case analysis of the cases

Type of Cooperation	Symbiosis Dimension		
	Mutualism	Commensalism	Parasitism
Hitchhiking	-	-	4
Carpooling	16	(4)	-
Bus rides	9	17	1
Convoy	1	1	1
F1-team	5	-	-

A word of caution is necessary in the interpretation of the cross-case analysis. Based on the descriptions of the case studies, and even with additional input from the involved researchers, it remains difficult to draw hard conclusions about the way in which the involved parties actually benefited from the cooperation. In several cases only a strong suggestion was created in the case description. Even more difficult – and mostly impossible – was it to determine the benefits for different individual departments within the cooperating organizations. Some departments may profit more than others by group purchasing. More in-depth research is necessary to determine the issues mentioned above. In this context, a clearer definition of what kinds of benefits group purchasing members experience may explain why some purchasing groups allow apparent hitchhiking.

Discussion

This paper has extended the highway matrix with a third factor to deal with the relationships in a purchasing group. It serves the purpose of developing a classification model that is better suited for the purpose of the assessment of the fairness of the distribution of gains within a purchasing group. For the real distribution of gains one is referred to other literature in this field, Heijboer (2003) or Schotanus et al. (2006). An analogy with symbiotic relations in the field of biology has been used to specify the third factor. After that, symbiosis dimensions for the different types of cooperations have been assumed and 51 cases have been analyzed by authors of this paper to find support for the new factor.

It turned out that, in contrary to our expectations, carpooling and F1 teams as forms of cooperation are purely mutualistic in our data set and not commensalistic or mutualistic. Results for the other forms of cooperation only confirmed our expectations. The implication hereof is that we have adjusted the dimensions of carpooling and F1 teams to purely mutualistic in the extended highway matrix.

The main question posed is how the extension of the highway matrix can help to increase its usefulness in determining the way to manage the relationships between involved parties and more specifically the distribution of gains?

The classification model developed in this paper provides an initial step towards a fair distribution of gains for group purchasing organizations. How this fair distribution should or can be realized is not researched here, but provides material for discussion. Allocation and control mechanisms may provide a solution to the problem of unfair distribution of gains. This may change the dimension of parasitic or commensalistic purchasing groups towards a mutual beneficial one.

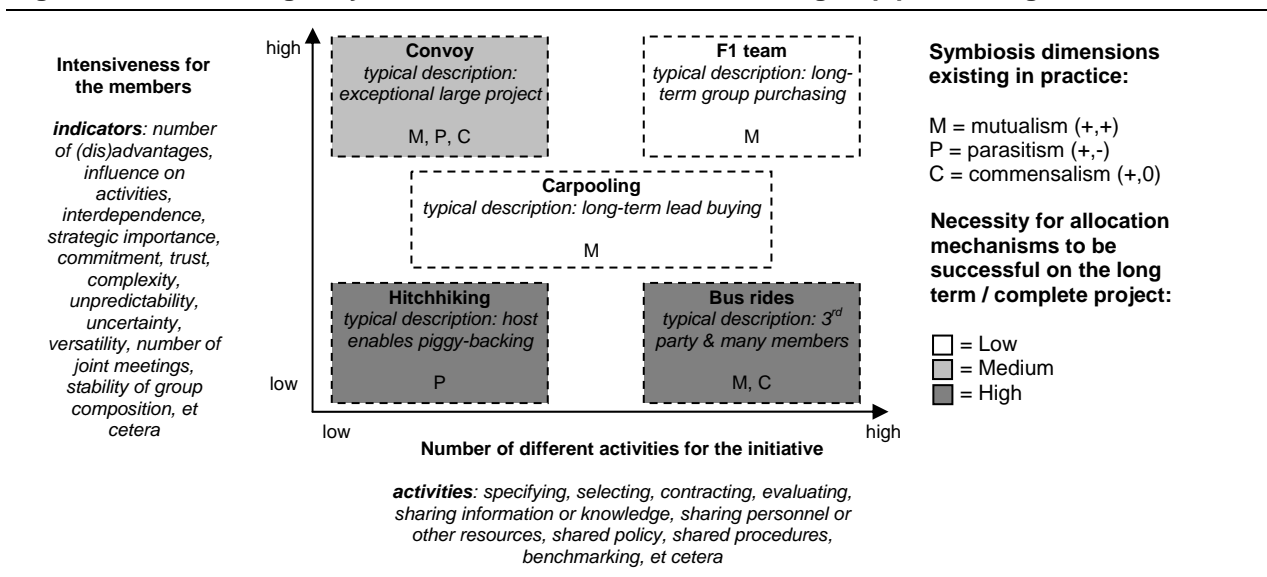
An illustrative example where this has happened in practice is provided by the Massachusetts Higher Education Consortium. This purchasing group can be classified as a typical bus ride, because the MHEC is a third party that undertakes many activities ranging from purchasing computers to caps and gowns and the MHEC has over eighty members (Bishop, 2002). The allocation mechanism that has prevailed for twenty years was as follows. Dues were tied to the school's last three-year average of the purchased volume. Small schools that buy less pay less in dues, and big schools that buy more pay more. According to the 2004-2005 annual report of MHEC this mechanism has been found to be unfair and the basis for the

dues structure has changed from a three-year average of purchased volume to a structure based on enrolment and staffing. Since a broad based committee has voted unanimously for this new mechanism it can be concluded that this new allocation mechanism is of a perceived mutual benefit. The dimension of the purchasing group has therefore shifted towards from commensalism towards mutualism.

Figure 2 presents the extended highway matrix. The highway matrix has been extended with a symbiosis dimension. Since the dimension provides information on the distribution of gains, it implicitly also provides information about the necessity for an allocation mechanism. This has also been indicated in the extended highway matrix by means of different colours. It is as with the municipal health service – another analogy – which advises you to get a vaccination when travelling to foreign countries (high risk of infection) or not (low risk) or if it is something to take into consideration given the specific circumstances but not always necessary (medium risk). The extended highway matrix can be used by managers to evaluate the attractiveness of a purchasing group or to know how to change a cooperation into a mutual beneficial one. Note, however, that mutualism is not always a stable form of cooperation (Schotanus et al. 2006). If some organizations profit much more than other similar organizations, then this may also lead to allocation problems. So, even in cooperative forms which are typically mutualistic, there exists a low risk of allocation problems.

This paper merely presents the first step in developing a tool for classifying purchasing cooperation, while focussing on the relationship aspects within the cooperation. More research is necessary for increasing the validity and assessing the utility of the model.

Figure 2: Extended highway matrix; a classification of forms of group purchasing



Another interesting point mentioned by two contacted authors is that some purchasing groups indeed allow hitchhiking and do not perceive it as negative for the purchasing group as a whole. Reasons for this to happen provide also material for discussion. An example provided by one them is the public purchasing group of the municipality Groningen in the Netherlands. The municipality Groningen allows towns nearby to hitchhike on its contracts. Their purchasing volume does not contribute in a sense that it would lead to lower prices (initially). It even induces some extra costs for the municipality of Groningen. According to the extended highway matrix this can be classified as hitchhiking and parasitism. However, a justly remark made here is that the reputation of the municipality of Groningen improves by doing this. This may be beneficial to the municipality.

Another issue to consider is the effect of delays of potential benefits. The municipality may not benefit directly from allowing towns nearby to hitchhike, but in a later stage suppliers may value the actual purchases the towns have made, thereby providing a better deal for the municipality later on. A third reason may be mutually altruism (e.g. Brehm et al., 2005). If you help somebody else they may help you

later on. Thus, at first sight the cooperation seems to be parasitic; to find out whether this is really the case asks for a longer time horizon of the analysis. The question how to distribute the gains fairly among the group purchasing members than becomes even more difficult. In the end, all parties have to benefit in one way or the other for the group purchasing organization to be successful in the long run.

Future research could empirically test the extended highway matrix to find more support for it.

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Appendix: Empirical Data; Group Purchasing Classification

No. Case	Form of Cooperation	Level of cooperation	Mutualism	Commensalism	Parasitism	No. Case	Form of Cooperation	Level of cooperation	Mutualism	Commensalism	Parasitism	
1	A successful public consortium - The Wisconsin technical IT&T consortium	Carpooling		x	x		26	Premier Inc. US hospital purchasing consortium	Bus ride	National		x
2	Voluntary Hospitals of America	Bus ride	National		x		27	Novation US hospital purchasing consortium	Bus ride	National		x
3	Hospital federation of nine hospitals in the Rochester area	Carpooling		x			28	Amerinet	Bus ride	National		x
4	Local Network	Carpooling/Hitchhiking	Local/Regional	x		x	29	Consorta Catholic Resource Partners	Bus ride	National		x
5	Volunteer Confederation	Carpooling	Local/Regional	x			30	Premier	Bus ride	National		x
6	Regional Purchasing Agency	Bus rides (more intensive than an average bus rides)	Regional		x		31	Shared Services, Healthcare Inc.	Bus ride	National		x
7	Member-owned service bureau	Bus rides (more intensive than an average bus rides)	Regional		x		32	Health Insurance Plan of California (HIPC)	Bus ride	Regional		x
8	For-Profit Enterprise	Bus rides (typical bus ride)	National	x			33	GPOs in the health care industry in the USA; HIGPA	Bus ride	National		x
9	National Health Service, UK; Professionia networks	Carpooling		x			34	IAPSO	Bus ride	International		x
10	Pharmacy buying consortia: members (users, not purchasing) divide who does what (mostly based on expertise and skills)	Carpooling		x			35	Small UN agencies piggy-back on some contracts of large agencies (these mostly one-time coops don't have specific names). E.g., some of the UN offices in Nairobi piggy-back on UNON's contracts. The collaborative purchasing initiatives would normally be entertained for commodities easily available in large quantities.	Hitchhiking	International		x
11	Confederations: similar as the example above	Carpooling		x			36	Carpooling, no specific names known. The agency having most experience/resources/volume would normally take the lead. Often a Unit Chief coordinates the collaborative purchasing initiative.	Carpooling	International	x	
12	Collaborative Procurement Hubs	Bus ride			x		37	Groningen	Hitchhiking	Regional		x
13	The Massachusetts Higher Education Consortium	Bus ride	Regional	x			38	Police force	Carpooling	National	x	
14	Canadian Association of University Business Officers	Carpooling		x	x		39	Netwerkstad Twente	F1-team	Local	x	
15	Interuniversity Services Incorporated	Bus ride	Regional	x			40	Netwerkstad Twente, sometimes the coop allows others to piggy-back	Hitchhiking	Regional		x
16	Canadian Universities Reciprocal Insurance Exchange	Bus ride	National	x	x		41	OT2000	Mainly a convoy, but several org. hitchhiked on the contract	National		x
17	SUPC	Bus ride	Regional	x			42		F1-team	Regional	x	
18	CHEST	Bus ride	National		x		43	Steden3hoek	F1-team	Regional	x	
19	Central Buying Consortium (CBC)	Carpooling	Local	x	x		44	Friesland zorg	Carpooling	Regional	x	x
20	London Universities Purchasing Consortium (LUPC)	Bus ride	Regional	x	x		45	Intrakoop	Bus ride	National		x
21	Corporate United	Bus ride		x			46	Moerdijk	F1-team	Local	x	
22	South Australia Human Services Libraries Consortium	Carpooling		x			47	Papendrecht et al.	Carpooling	Local	x	
23	Case A: Healthcare Industry	Bus ride		x			48	PIANodesk	Bus ride	National		x
24	Case B	F1-team		x			49	Vlaardingen et al.	Carpooling	Local	x	
25	Case E: A Canadian Electric Power Generator	Bus ride		x			50	Purchasing consortium of Finnish machinery manufacturers	Carpooling		x	
							51	OT2006	Convoy	National	x	x

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