

## **Collective Memory Support in Negotiation: A Theoretical Framework**

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### **Abstract**

*Negotiation analysis is complex. It may involve multiple issues of dispute, rules of negotiation, negotiators' strategies, interventions by third party, negotiators' cognitions, beliefs, preferences and attitude towards risks. Negotiators may have limited attention, limited capacity to store and retrieve memory information and limited capacity to process information. As a result they rely on heuristics or schemas and fail to generate optimal outcomes in negotiation. An approach to overcome cognitive limitation in negotiation is to provide additional support to store and retrieve memory information. This paper reiterates the conceptual framework of a computer supported negotiation memory support system (NMSS) and proposes a theoretical model of the influence of NMSS on negotiation outcome.*

**Key words:** *Collective memory, group decision support systems, negotiation support, organizational memory*

### **1. Introduction**

Negotiation is a process in which two or more parties (individuals, groups or organizations) with conflicting interests attempt to resolve differences and arrive at outcome(s). The parties engaged in a negotiation process may try to resolve their disagreement along multiple dimensions. Bargaining can be viewed as a limiting case of negotiation in which the parties dispute over a single dimension [19]. Examples of negotiation abound both inside and outside the organization. Collective bargaining, budget allocations, finalization of contracts, working out purchase price with suppliers are some common examples of organizational negotiations. Information systems that support negotiation activities are categorized as negotiation support systems (NSS). Various implementations of NSS have been discussed in the literature [33].

Negotiation analysis is complex. It may involve multiple issues of dispute, rules of negotiation, negotiators' strategies, interventions by third party [15] negotiators' cognitions [22], beliefs, preferences and attitude towards risks [13]. Although various prescriptive approaches for negotiation have been proposed [26], negotiators may not implement these approaches because of the various systematic judgmental deficiencies that they may suffer from. Pruitt and Carnevale [25] discuss the cognitive effects that can influence negotiation outcome. Negotiators have limited attention, limited capacity to store and retrieve memory information and limited capacity to process information. As a result they rely on heuristics or schemas and fail to generate optimal outcomes in negotiation. To address this lacuna, this paper focuses on providing memory support in negotiations. Bazerman [5] discusses five unique systemic biases that create cognitive limitations. A way to overcome these limitations is to provide external memory support and information processing support. This paper focuses on memory support and its influence on negotiation outcome. Negotiation involves more than one party. Each party can either be an individual or a group. As such, the negotiation memory should contain information that can be used by a collective body of individuals. This is termed as the collective negotiation memory in this paper.

The organization of the paper is as follows: section 2 presents the overview of the negotiation issues with an emphasis on cognitive processes. In section 3, the outline of the organizational memory has been discussed. Organizational memory is an instance of collective memory. Section 4 presents the conceptual framework of negotiation memory support system (NMSS). In section 5, a theoretical model highlighting the influence of NMSS on negotiation outcome has been discussed. Section 6 presents the concluding remarks of the paper.

## 2. Negotiation Issues – Cognitive Process and Social Norms

Negotiation is a type of mixed-motive task [19]. Two or more parties representing two or more sets of interests interact to resolve differences and agree on outcome. Negotiations can involve individuals, groups and organizations. Negotiations can be integrative (i.e. parties working cooperatively to achieve win-win solution) or distributive (i.e. parties working competitively to arrive at win-lose situation). The possible outcomes of the negotiation process are *victory for one party*, *compromise*, *integrative or win-win agreement* and *failure to reach agreement*. Various strategies followed in negotiation fall under any of the following five broad categories [25]:

- Concession making: Reduction in goals and/or demands.
- Contending: Persuading other negotiators to concede
- Problem solving: Trying to identify and adopt solutions that satisfy the goals of the parties.
- Inaction: Not making any significant move in the negotiation process.
- Withdrawal: Dropping out of the negotiation process.

Pruitt and Carnevale [25] discuss the theoretical paradigm of negotiation from behavioral research perspective. In the simplistic form of the paradigm, the conditions that exist at the time of negotiation can impact the psychological states of the negotiators and the psychological states can influence the negotiation outcomes. This impact may be mediated by strategies followed by the negotiators. The psychological states can be motivation, perception and cognition of the negotiators. Later Pruitt and Carnevale [25] extend the paradigm to include other conditions (such as social norms in which the negotiation takes place, relationship among negotiating parties, influence of mediators and group process) that can impact the choice of negotiation strategy and outcome. The remaining part of this section discusses the cognitive issues and highlights how memory information can be used to overcome some of these effects. Social norms are also important in negotiations and can be stored in collective negotiation memory. As such, social norms have also been discussed in this section.

Cognitive Issues: Cognitive issues that have significance in negotiations are *the fixed-pie assumption*, *illusory conflict*, *negotiation scripts*, *rigid thinking*, *overconfidence*, *availability*, *representativeness*, *anchoring and insufficient adjustment*, *framing* [25]. Negotiators attempt to overcome these cognitive effects

by using heuristics and schemas. However, neither the heuristics nor the schemas are the most appropriate means to resolve the complexities that are normally associated with negotiations. Heuristics are mental shortcuts to oversimplifying the strategies to manage negotiation information. Schemas are cognitive structures developed from prior observations and may influence negotiators to focus only on those aspects of negotiation that support their preconceptions. As a result, negotiators may ignore other critical issues.

As already mentioned, an approach to overcome some of the cognitive limitations in negotiation is to provide additional support to store and retrieve memory information [25, 18]. The “fixed-pie assumption” arises because negotiating parties perceive that they are engaged in a win-lose situation. In a negotiation involving multiple issues, if a negotiator finds that the other party does not have same priorities as the self, the fixed-pie assumption becomes false. Neale and Northcraft [21] found that experienced negotiators were less susceptible to “fixed-pie assumption.” By retrieving and analyzing negotiation memory information, negotiators develop understanding about the preference of the other party on various issues. Sometimes, negotiators dispute over common values i.e. issues that both parties want to achieve without realizing it. This may result in sub-optimal negotiations. Again, if one negotiator perceives that there exists a “common value”, while the other negotiator fails to realize it, there exists a possibility of exploitation [25]. Careful analysis of memory information can help negotiators to identify the “common value” and hence overcome the perception of illusory conflict. Negotiators may hold intuitive theories about the negotiation process. This has been termed as “negotiation script.” Negotiators may be “overconfident” about their success and may expect unrealistically greater concessions from opponents. These effects can be avoided if negotiators study carefully the negotiation history stored in collective memory. It, therefore, appears that access to negotiation memory information can help negotiators to overcome some cognitive limitations and hence improve the negotiation outcome. Needless to say, the memory information should be relevant to both parties engaged in a negotiation. This is a collective memory rather than individual memory. An instance of collective memory is organizational memory, which is an important area of research in management. Section 3 presents an overview of organizational memory, which may be useful in understanding the concepts of collective memory.

Social norms: Norms are shared beliefs about peoples’ behavior. Norms are important in negotiation tasks because they have the potential to regulate social conflict [30]. Norms can *prevent conflict*, *regulate the way conflict is conducted*, and *provide solutions once*

*conflict arises* [25, 30]. In a negotiation task, norms can impact the positions taken, arguments made and agreements reached by negotiators [25]. Fairness principles, such as equality rule, equity rule, needs rule may be applied in negotiations. Negotiation efficiency as well as the possibility of reaching agreement improves if negotiators can agree on the principles that are applicable and the interpretation of the principles. When negotiators fail to reach agreement on the principles, they can study the negotiation memory information and try to identify the principles that were successfully employed in the past.

Although various forms of computerized systems to support negotiation and mediation have been developed, most of these systems focus on providing analytical support on negotiation. These computerized systems are known as negotiation support systems (NSS). Turban and Aronson [33] present an overview of some of these systems. These systems consist of decision support systems (DSS) for individual negotiators; the individual DSSs are networked so that negotiators can have electronic communication. Following the theoretical model proposed by Lim and Benbasat [18], one can argue that the use of DSS enhances the information processing support for the negotiator while the use of electronic communication influences the perceived commitment of opponent. Anson and Jelassi [3] propose the expanded set of NSS operations to support integrative bargaining activities. Foroughi [10] summarizes how different features of NSS have been used to address major “stumbling blocks” to successful negotiations. Almost all of these approaches focus on providing support to an ongoing negotiation. Use of collective memory support in negotiation is not a distinct feature of a typical NSS. In order to address this lacuna, this paper focuses on the information systems implementation of collective memory to be used in negotiations.

### 3. Organizational Memory

Organizational memory is an instance of collective memory that refers to the social process of articulating, exchanging and sharing information so that shared interpretations can be formed [12]. Organizational memory is retained in its individuals, cultures, transformations (that occur in organizations), structures and workplace ecology [34]. Moorman and Miner [20] describe three basic manifestations of organizational memory as collective beliefs, behavioral routines and physical artifacts. Organizational memory can facilitate organizational learning [14]. Conditions favorable to learning occur when organizational knowledge is stored in organizational memory and made available for shared interpretation by others [7]. Other uses of organizational memory are lowering resistance to making decision choices and lowering transaction costs to implement the

chosen decision [34]. A major misuse of memory is the encased learning of users, which may invoke routine responses to non-routine situations [29].

Organizational memory has two fundamental roles: *interpretation role and action guidance role* [20]. Organizational memory can act as a filter to categorize information and knowledge (interpretation role); organizational memory can also influence the action of an individual or group (action guidance role). Various dimensions of organizational memory are amount (high vs. low level), dispersion (centralized vs. shared), accessibility (public vs. restricted) and content (declarative vs. procedural) [9, 20, 29].

Organizational memory has many overlapping interests with organizational knowledge management. Organizational knowledge management involves the process of collection, codification, integration and dissemination of organizational knowledge [2]. Organizational memory is the means of storing the organizational knowledge and applying it to present activities of an organization. A knowledge management system becomes valuable when the knowledge can be shared within the organization. If the shared knowledge is relevant, it is used in various tasks and may be stored in organizational memory. The organizational memory can be activated later and its stored knowledge may be retrieved and reused. Thus from a knowledge management perspective, organizational memory can be viewed as the repository of reusable experience “objects” [1]. The sharing and distribution of knowledge and its use may not be easy and free from problems. Some of the common problems are “missing link problem,” “dangling link problem,” and cultural issues [27]. A “missing link problem” occurs when new information cannot be linked with a current pool of knowledge. This may happen when the cognitive capacities of users are limited, users lack interest, and time. The missing link problem may lead to rejection of new information. The “dangling link problem” results in a situation where more information is requested. Another issue that influences the extent to which information is shared is the culture of the collective body. An organization/group that is generally secretive is likely to share less information [27].

### 4. Memory Support in Negotiations – Negotiation Memory Support System

A macro-level framework of collective memory support in negotiations has been discussed in [24]. The memory support contains historical information and/or the knowledge gleaned from previous negotiation sessions. This memory support can be external to a NSS. An information system implementation of this memory is termed as negotiation memory support system (NMSS). A schematic view of NMSS is shown in figure 1. The

negotiation information repository contains instances of various negotiation data/information entities. Following on the theoretical models of NSS proposed by [13, 15], a list of these entities have been identified and presented in Table 1. Some typical uses of the negotiation data/information entities can be:

- By analyzing the lists of issues covered in similar negotiation activities in the past, the negotiators can ascertain the completeness and relevancy of the issues included in the current negotiation session.
- By examining the issues considered by other parties in similar negotiations in the past, the negotiator can discover that the opponents may not have the same priorities on these issues as the self. As such, the negotiator can get out of the *fixed-pie assumption* and hence win-lose mentality.
- By reviewing previous acceptance regions, locations, movements, agreement regions and final solutions, the participants can possibly learn more about a particular negotiation process and get better prepared to tackle any new move in an ongoing negotiation.

The negotiation knowledge repository contains collective beliefs, norms, frames of reference, behavioral routines and social norms (Table 2). These are termed as knowledge objects. The participants of a negotiation session can reuse these knowledge objects with or without modifying it.

The negotiation information and knowledge repositories can be controlled by a negotiation memory management system (NMMS). The primary functions of NMMS are to capture, update, and retrieve necessary information entities and/or knowledge objects. In order to carry out its functions efficiently, the NMMS should be able to identify each information entity or knowledge object uniquely. This can be achieved with the help of an appropriate directory service. Once an entity/object is identified, the NMMS can activate appropriate data management or knowledge management functions depending on the nature of request.

Action and presentation system is the interface through which the NMIS can receive requests from and transmit its response to users. The request for memory information can also come from NSS whenever a particular event is triggered (for example, finalizing issues of negotiation or rules of negotiation).

Entity Type	Entity Description
Negotiation session	<ul style="list-style-type: none"> <li>▪ Details of a negotiation session, such as <i>date, time, outcome</i></li> </ul>
Issues	<ul style="list-style-type: none"> <li>▪ The matter of contention</li> </ul>
Participants	<ul style="list-style-type: none"> <li>▪ Individual /representative of groups or organizations participating in negotiation</li> </ul>
Acceptance region	<ul style="list-style-type: none"> <li>▪ Acceptable set of outcome for <u>each</u> participant at a time “t”</li> <li>▪ Depends on issues and rules of negotiation</li> </ul>
Agreement region	<ul style="list-style-type: none"> <li>▪ Acceptable set of outcome for <u>all</u> participants at a time “t”</li> <li>▪ Depends on issues and participants</li> </ul>
Location	<ul style="list-style-type: none"> <li>▪ An acceptable outcome for each participant at a time “t”</li> <li>▪ Depends on acceptance region</li> </ul>
Movement	<ul style="list-style-type: none"> <li>▪ Participants movement to a different location</li> <li>▪ Depends on strategy, rules of negotiation and others movements</li> </ul>
State of negotiation	<ul style="list-style-type: none"> <li>▪ Acceptable outcomes for all participants at a time “t”</li> </ul>

**Table 1 : Contents of Negotiation Information Repository [13, 15, 24]**

Object Type	Object Description
Collective beliefs	<ul style="list-style-type: none"> <li>▪ Collective knowledge or norms regarding the negotiation, such as opponent’s reservation price, attitude towards risk, preferences</li> <li>▪ Social norms on fairness principle</li> </ul>
Collective frames of reference: <i>Strategies</i>	<ul style="list-style-type: none"> <li>▪ Previous strategies employed by participant(s) to tackle different dimensions of an issue, to deal with acceptance regions</li> </ul>
Behavioral routines: <i>Rules of negotiation</i>	<ul style="list-style-type: none"> <li>▪ Permissible interaction and movements in the negotiation process, such as time constraints, influence tactics, communication tactics and conflict resolution mechanisms</li> </ul>

**Table 2: Contents of Negotiation Knowledge Repository [13, 15, 24]**

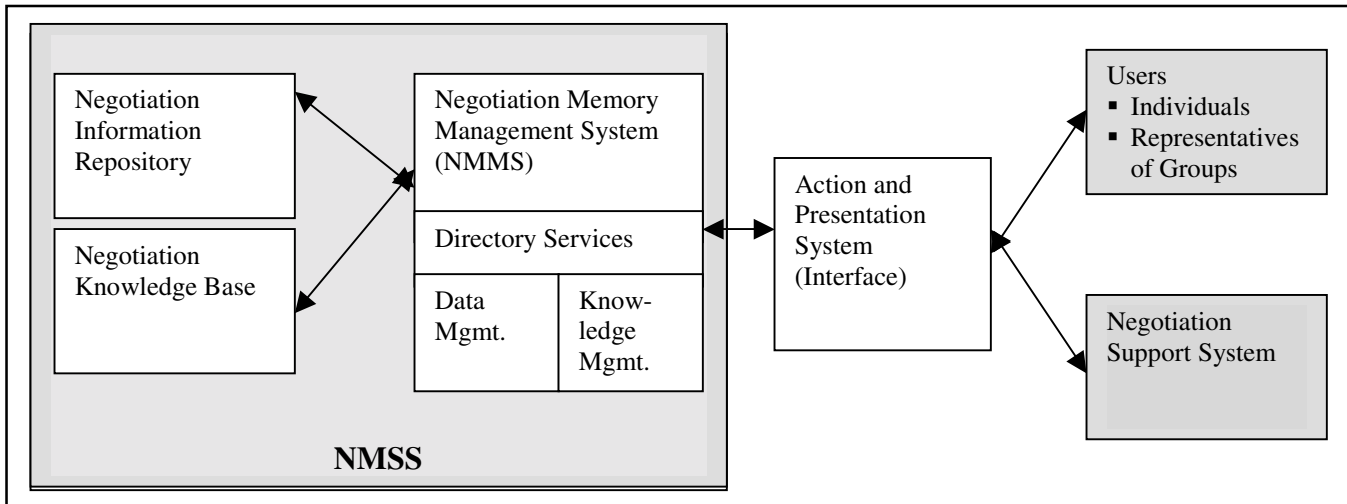


Figure 1 Schematic view of Negotiation Memory Support System [24]

## 5. Negotiation Memory Support System and Negotiation Outcome

Figure 2 presents the theoretical model of the influence of collective memory support on negotiation outcome. The negotiation memory support has two roles: information interpretation and action guidance. The use of memory support is expected to impact five dependent variables concerning negotiation outcome: *integrative or win-win agreement (reflected in terms of joint gains)*, *instances of exploitation*, *negotiation time*, *confidence with negotiation outcome* and *satisfaction with negotiation process*. The model has following boundary conditions:

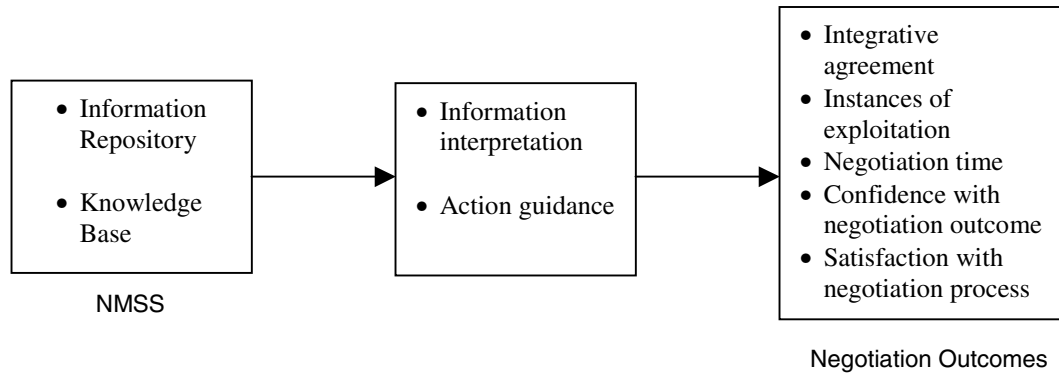
- The negotiations are repetitive or recurring in nature and involve similar issues. Negotiation memory may not have much utility for one-time negotiations dealing with unique issues.
- Only two parties are involved in the negotiation. In negotiations involving more than two parties, coalitions of parties (i.e. subgroups) may be formed [18]. This calls for development of more complex model.
- Negotiations involve multiple rather than single issues.

The information interpretation roles of collective memory have been discussed in the decision support and group decision support literature. While discussing various forms of process support that can be provided by a group decision support system (GDSS), Nunamaker,

Dennis, Valacich, Vogel, and George [23] highlight the utility of group memory in gathering more information, in remembering key information on decisions and in reducing incomplete use of information. They further mentioned that a group memory that assists in queuing and filtering information might reduce information overload. Hine and Goul [16] discuss how organizational memory and other knowledge sources can be used to develop individual manager's interpretation of strategic environment. Managers can exchange individual interpretations to improve their understanding of the competitive environment and work on achieving consensus so that global interpretation can be formed. The global interpretation can impact organizational decision-making.

Like organizational memory, collective negotiation memory can also perform information interpretation role. In the context of negotiation, information interpretation support involves explaining the meaning of various negotiation parameters, such as *issues*, *participants*, *acceptance regions*, *agreement regions*, *participants' movements* and providing the framework to categorize the instances of these parameters based on various negotiation outcomes.

The collective negotiation memory can also have an action guidance role. The knowledge objects (Table 2) of the collective negotiation memory can enlighten negotiators on negotiation norms, social norms, rules of negotiation and negotiation strategies. The collective memory can also have trajectories, which are the projected consequences of later uses of the memory [1, 6].



**Figure 2 Theoretical Model on the influence of NMSS on negotiation outcome.**

Integrative or win-win agreement: Literature on negotiation tends to support that exchange of information about negotiators’ priorities and preferences are associated with joint gains in negotiation [28, 11, 32]. Siegel and Fouraker [28] found that shared information could increase the likelihood of maximizing joint outcome in bargains. Thomson [32] found that more integrative agreements were achieved when negotiators exchanged information. A repository of this shared information can be the negotiation memory. The memory can contain information on negotiators’ preferences on various issues. By carefully analyzing this information, the negotiators may be able to identify the likely preference pattern of the other party and compare it with the preference pattern of the self. A very little commonness in the preference patterns will indicate that the negotiating parties are less likely to have conflict of interests. This information may help them to overcome “the fixed-pie” assumption and approach negotiation with a “win-win” mentality. As a result, the joint gains will increase. Hence:

Proposition 1: In repetitive negotiation involving multiple issues, higher joint gain will be achieved for negotiations with collective negotiation memory than for negotiations with no memory support.

Exploitation: A negative side of sharing negotiation information on negotiations is the possibility of having exploitations. Babcock et al [4] discuss how a party receiving the information of others preferences may induce others to offer concessions resulting in a disproportionately low gain of the “information disclosing negotiator.” Babcock et al [4] discuss that effective exploitation may depend on the skill and experience of negotiators. Exploitation potential also exists regarding “common value” issues (i.e. both parties want the same thing but they do not realize it). The possible situations can be one negotiator realizes the “common value” while the other does not [17];

experienced negotiators dealing with naïve opponents [31]. In order to reduce the exploitation potential, the negotiators can study carefully the negotiation history and analyze issues and associated preferences of the parties in previous negotiations; they can also try to identify the “common values” of the previous negotiations. A negotiator, who is informed on the possible issues of the opponents and the “common values” of negotiation, is less likely to be exploited by others. Hence:

Proposition 2: In repetitive negotiation involving multiple issues, the instances of exploitation will be less for negotiators with collective negotiation memory than for negotiators with no memory support.

Negotiation time: Lim and Benbasat [18] hypothesized that the use of computerized communication and decision support would shorten negotiation time as compared to the use of the decision support only. However, Delaney, Foroughi and Perkins [8] did not find any support for this hypothesis in their empirical study. They highlight that unfamiliarity of the study subjects with computer support systems might have contributed to this result. They also find that the use of DSS, in fact, increases the negotiation time as compared to having no computer support. The use of collective memory support may, however, present a different scenario for repetitive negotiations. The negotiators can learn about the negotiation by studying the collective negotiation memory. As a result, they are likely to spend less time in trying to comprehend the negotiation situation. Additionally, the negotiators are likely to be less hesitant to make decisions. They can justify their decisions by drawing reference from the previous instances in the collective memory. The collective memory also enables the negotiators to form shared interpretation on issues and “common vales” of negotiation. The negotiators can also be aware of the various forms of individual preferences on issues. As the negotiator’s attention is drawn to the issues

and other parameters of negotiation, the possibility of having nonrational escalation of conflict will reduce. The combined effect of faster comprehension of negotiation situation, less hesitation in making decisions and possible reduction of nonrational conflict is expected to shorten the negotiation time significantly. Hence:

Proposition 3: In repetitive negotiation involving multiple issues, the negotiation time will be shorter for negotiators with collective negotiation memory than for negotiators with no memory support

Confidence with Negotiation Outcome: Lim and Benbasat [18] proposed that negotiators using decision aid would have a sense of control over the negotiation process and outcome. The decision aids are the supports for making rational decisions. The inclusion of the collective negotiation memory in the decision aids will help negotiators to overcome some of the cognitive effects discussed in section 2. The negotiators using the collective memory are likely to perceive that they are well informed and in control of the situation. As a result, they are likely to gain confidence. Hence:

Proposition 4: In repetitive negotiation involving multiple issues, confidence with the negotiation outcome will be higher for negotiators with collective negotiation memory than for negotiators with no memory support.

Satisfaction: As proposed in this paper, the use of collective memory is expected to achieve higher joint gain, have fewer instances of exploitation, and result in faster negotiations. The negotiators using the collective memory are likely to perceive that they are well informed and are confident to make negotiation decisions. This will have a positive effect on their satisfaction with the negotiation process. Delaney et al [8] also found that satisfaction improves when DSS are used in low conflict as well as high conflict tasks. Hence:

Proposition 5: In repetitive negotiation involving multiple issues, satisfaction with the negotiation process will be higher for negotiators with collective negotiation memory than for negotiators with no memory support.

## 6. Conclusions

This paper advocates the use of collective memory support in repetitive and recurring negotiations involving two parties. The use of collective memory can enlighten negotiators on the complexities associated with a negotiation and help them to develop shared interpretation. This may enable them to overcome some of the cognitive effects (such as “the fixed-pie assumption,” “illusory conflict”) that can have adverse

influence negotiation outcome. Additionally, the negotiators’ actions may be guided by the social norms, negotiation norms, rules and strategies of negotiation stored in the collective memory. A theoretical model highlighting the impact of collective memory on negotiation outcome has been discussed in this paper. The model, however, has some limitations. This memory support may not be suitable for negotiations that are one-time and focus on unique issues. While explaining the utility of the memory, only the cognitive issues and social norms have been taken into consideration. Other conditions that have the potential to influence the negotiation strategy and outcome are individual differences, motivation of negotiators, presence of mediators and group process and networks. Some of these may be included in an expanded framework of memory support. Finally, the theoretical model shown in Figure 2 can also be expanded to include negotiation strategy and negotiation structure.

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