Moderating effects of information access on project management behavior, performance and perceptions

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[Accepted for publication at the ***Journal of Operations Management***]

Abstract

Effective project management relies on the timely exchange of information regarding appropriate resource availability, associated scheduling options, and related costs and benefits. At the same time, such information, or lack thereof, can also impact the behavior of project managers in ways that do not directly focus on work objectives but nevertheless affect performance. The research developed in this paper is primarily focused on demonstrating both direct and moderating effects that information can have on decision makers' actions and perceptions in an environment where multiple projects are pursued simultaneously. In order to study these linkages we designed and executed a controlled experiment designed to simulate aspects common to a multi-party project-management environment. Our findings suggest that greater visibility of situational information in this environment impacts project outcomes mainly by affecting a project manager's actions and perceptions regarding both the behavior of others and the priority given to his/her task. The study extends existing information processing theory by developing and examining notions of informed rationality and reciprocity, as well as examining the effect of information on post task sense making. Insights from the study suggest a set of behavioral issues that should be considered in future information processing and project management research.

Keywords: information technology, project management, behavioral experiment

Introduction

In environments characterized by moderate to high task uncertainty, informational mechanisms can provide indispensable benefits to rational decision-making (Galbraith 1977). However, in many cases information-driven non-task behaviors (eg. social behavior; Podsakoff et al. 2000) can impact task specific outcomes as well (Puffer 1987; O'Reilly and Chatman 1986). Particularly in environments where multiple parties interact to allocate limited resources (e.g. project management settings), the same informational mechanisms that provide insights towards superior operational performance may also serve to bias perceptions of organizational behavior. Since the implications of these perceptions apply both to immediate task-related decisions as well as future behavior and task-performance, managers need to consider the role that increased information visibility can have across a range of behaviors, task and non-task alike. This point is increasingly relevant given the rapid evolution of modern IT infrastructures capable of disseminating task-related information more effectively.

Project management is an area in which these issues are tremendously relevant. In an environment of multiple simultaneous projects, there are interdependencies between projects as they interact in order to share scarce resources. Thompson (1967) referred to these interdependencies and inverse interdependencies, since the resource allocation for each project is inversely related to resources available for other concurrent projects. Verma and Sinha (2002) describe cases in which human resource availability and priorities placed on projects drive performance both for the local project and for the overall project pool. The perceptions and resource sharing behaviors of decision makers in this environment are likely to be influenced by the information available to them, in complex ways. Unfortunately, such broad consideration of the role of information sources is not yet common practice among higher level managers. Often, their infatuations with the planning and scheduling capabilities of project management information system tools may lead them to neglect behavioral implications of their use (Tukel and Rom 1998; Gray and Larson 2000; Brown, 2002). A similar limitation exists in academic research of concurrent project management issues. Numerous research studies have examined the effectiveness of various rules for assigning resources to concurrent projects (Yang and Sum, 1993; Icmeli and Erenguc, 1996; Smith-Daniels, Padman, and Smith-Daniels, 1996; Kolisch, 1996; Ozdamar and Ulusoy, 1996), yet there has been very little study of the behavioral factors that affect decision makers' willingness to share resources. Moreover, researchers have not addressed the impacts of sharing behaviors on local, global, and future project outcomes.

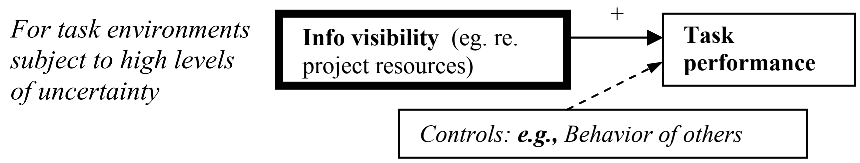
The research developed in this paper is primarily focused on demonstrating the critical role that information can have on a decision makers' actions and perceptions in project management contexts. This role includes both direct and moderating effects on decision makers' actions, which in turn affect immediate task performance. Information also affects decision makers' perceptions about the project task and the related work environment, which may affect their actions and performance in future tasks. In order to study these linkages we designed and executed a controlled experiment with the intent of simulating aspects common to an environment of multiple simultaneous projects.

Our findings suggest that greater visibility of information that is current and specific to a multi-project environment (ie. situational information) impacts performance mainly by affecting a project manager's actions and perceptions regarding both the behavior of others and the priority given to his/her task. The study extends existing information processing theory by developing and examining notions of informed rationality and reciprocity, as well as examining the effect of information on post-task sense-making. Insights from the study suggest a set of behavioral issues that should be considered in future information processing research. Further, the results offer implications for development and effective use of information systems in a project management environment. In the following sections of this paper we develop the theory supporting our expectations regarding effects of situational information, we describe the experimental method used to test related hypotheses, and we discuss the implications of the results for theory development, for practice, and for future research.

Research Models

Uncertainty is an unavoidable aspect of all projects (Gallstedt 2003; Tatikonda and Rosenthal 2000). It can come in a variety of forms, including uncertainty regarding the time to complete specific steps within a project, uncertainty regarding the availability of resources that might assist in project completion, and the uncertainty of the impacts that other projects and associated managing parties might have upon the focal project (Verma, et al, 2002). From the standpoint of Information Processing Theory, increased informational visibility aimed at reducing uncertainty in these settings should ultimately enable better decisions which create positive impacts on task performance (Galbraith 1977; Goodhue and Thompson 1995; Wright and Cordery 1999). A simplistic view of information impacts is provided in Figure 1.

Figure 1. Basic task-oriented focus of IPT

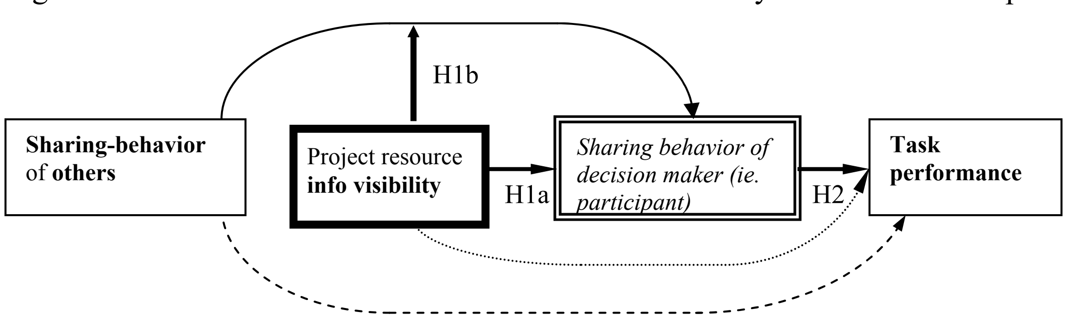


While a model of direct informational impacts on performance provides a good starting point for general discussion, in complex interactive tasks (e.g., simultaneous multi-project management environments) it is likely that information visibility takes on a subtler and more indirect role, given the myriad behavioral issues associated with such settings. In particular, the role of information as a moderator of behavioral relationships that ultimately impact performance requires detailed consideration when there is a strong belief that behavior critically impacts performance. For example, a project manager's decisions may be based on more than simply his/her "rational" understanding of the task at hand. Decisions may also be influenced his/her beliefs regarding the motivations of other decision makers upon whom he/she is dependent. We take as a given that added information enables decision makers to make higher quality decisions leading to better task performance. However, in this study we suggest that an even greater portion of variance in task performance can be explained by the relationship of information visibility to other behavioral effects.

Information-dependent Intermediate Outcomes

It is valuable to recognize that the actions of individuals charged with complex tasks (such as project management) may be motivated by both task-specific (i.e., locally or globally rational) objectives as well as non-task interests (e.g., social). Actions based on non-task social interests may not necessarily contribute positively to the task objective of the individual. They may in fact degrade such performance, as they may be more directed towards either positive or negative impacts on other parties (O'Reilly, et al 1986; Puffer 1987). Subsequently, as an enrichment of the simplistic model presented in Figure 1, we consider the potential influences of information on the behaviors (task and non-task focused) that ultimately impact task performance directly. In doing so, given the potential for certain non-task behaviors to be influenced by alternate organizational mechanisms (e.g., the sharing behavior of others), the role of information as a moderator of these effects also seems valuable to consider. Such an extended model is presented in Figure 2.

Figure 2. Intermediate outcome model: informed rationality and informed reciprocity effects



One rationale for a deeper consideration of the impact of the sharing behavior of others on an individual's own sharing behavior stems from the well established concept of *reciprocity*. The main proposition of what is generally referred to as the "reciprocity hypotheses" (e.g., Wall 1981) is that in many settings individuals will reciprocate the actions of others and in fact expect their own actions to be reciprocated (Gouldner 1960; Puffer 1987). Such a notion has been used to argue that objective maximization (whether local or global) cannot fully account for the actions of individuals in work environments where decisions and performance may be shared across multiple parties (Gallucci and Perugini 2000; Bolton and Ockenfels 2000; Ortmann, Fitzgerald and Boeing 2000).

While providing additional insights into the motivations behind what might be perceived as non-rational decision making, the unquestioned application of the "reciprocity hypothesis" has its limitations as well. For example, even when individuals would 'like to' reciprocate, resource restrictions may render such behavior considerably costly or even infeasible given the limitations of the operating environment (Mayer, David and Schoorman1995; Malhotra 2004). Since the implicit assumption of the reciprocity hypothesis is that the actions of other parties are sufficiently visible to be considered in subsequent reciprocal behavior, one would therefore expect that the visibility of the 'limitations' under which the actions of others are based should play a significant role as well. That is, if individuals understand that the actions of others may be restricted due to situational constraints, they may be less likely to reciprocate 'against' the other party (in contrast to scenarios in which it appears obvious that non-cooperative actions were simply a matter of choice or self interest for that party). Though implied by research such as that of Malhotra (2004) and Flynn (2003), the role of situational information (i.e. information current and specific to a work context) as a general moderator of reciprocity has not been rigorously investigated. Combined with a general view of information's impact on performance as mediated by actual behavior, this view of information as a moderator of effects on such behavior forms the basis of our first three hypotheses.

H1a : *Situational information positively affects a decision maker's sharing behavior.*

H1b : *Situational information positively moderates the effect of others' actions on the decision maker's sharing behavior*

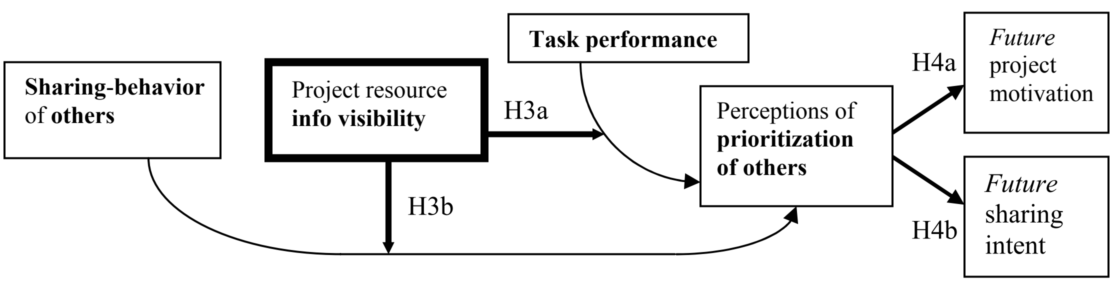
H2 : *The indirect effect of situational information on performance through its role in directing a decision maker's sharing actions is stronger than its direct effect on task performance.*

<u>Sense Making under Ambiguity</u>

Perhaps the most underappreciated aspect of situational information may be the potential for its impact to transcend task-related actions and performance, thereby impacting not only an individual's view of an isolated work scenario but also his/her view of the organization as a whole. Research has already established that an individual's perceptions of repeated actions by others (particularly peers and superiors) can lead them to form judgments about organizational environments as a whole (Cropanzano and Greenberge 1997; Naumann and Bennett 2000). While this can provide a positive outcome (e.g. an increase in motivation), it can also create undesirable interpersonal schisms that ultimately threaten performance. When the rationale behind observed actions or the causes of less than desirable levels of performance are ambiguous, individuals may structure judgments about these organizational outcomes that have little to do with reality (Difonzo and Bordia 1997; Norman 1982; Forrester 1961). Such "sense making" mental models of organizational influences, intended to rationalize (e.g. "credit" or "place blame for") outcomes and observed behaviors, can have profound impacts on a decision maker's interpretations of organizational dynamics. In turn, these judgments may affect his/her future behavioral intent (Alavi, Marakas and Yoo 2002; Neches 1987; Ansari and Simon 1979)

In operating environments involving resource sharing among multiple simultaneous projects, it therefore seems relevant to consider how information visibility may affect a decision maker's beliefs regarding both organizational climate and isolated tasks. Prior research indicates the importance of such an effect, often referred to as 'affect generalization.' The evidence shows that issues such as task performance and co-worker behavior can impact a decision maker's post task perceptions of specific organizational units (e.g., Bachrach, Bendoly, and Podsakoff 2001; Isen and Daubman 1984; DeNisi and Pritchard 1978) and of the organization in general. In project management settings, the pursuit of global (e.g., organization-wide) objectives provides a typical rationale for project prioritization and resource allocation policies (Brenner 1994). If this rationale and its effects on behavioral conflict and task performance are ambiguous, then individual decision makers may be more likely to attribute inter-project conflict and poor project task performance to other organizational causes. For example, if inter-project resource conflicts are not clear to individual decision makers, then these decision makers may attribute the behaviors of others to extracurricular motives. Further, they may develop more biased interpretations of project outcomes. We therefore propose that situational information can serve to moderate the logical linkages that individuals form between these aspects of reality and judgments regarding the organization as a whole. Such relationships are depicted in Figure 3.

Figure 3. Informational impacts on cause-effect rationalization (sense-making)



More specifically, we propose the following additional hypotheses with regard to the moderating effects of information visibility in project management settings:

> ***H3a:*** *Information negatively moderates (weakens) the relationship between task performance and a decision maker's post-task perception of prioritization*

> ***H3b:*** *Information negatively moderates (weakens) the relationship between the sharing behavior of others and a decision maker's post-task perception of prioritization*

A decision maker's misplaced perception of organizational prioritization represents only one possible schema for performance rationalization. If the effects represented in Figure 3 are supported by empirical data, then arguments for alternative forms of 'blame placing' (eg. "the other manager want to see me fail", "the other workers are not team players", etc.) and their implied organizational consequences on operational effectives may also be reasonable for future study. Further, this finding would endorse increased information visibility as a means for reducing the risk of these dysfunctional outcomes.

Sense Making and Future Intent

The consequences of a project manager's perceptions of project prioritization norms are likely to extend beyond immediate project circumstances. This perception can have negative consequences – particularly when managers perceive that their projects are repeatedly pushed to the sidelines (Cooper, Edgett and Kleinschmidt 2000). Such perceptions of organizational norms on prioritization, misguided or otherwise, can ultimately impact levels of motivation and behavioral intent by managers who anticipate being charged with future project responsibilities (Swink 2003; Gallstedt 2003). Stated formally, we expect the following:

> ***H4a*** *: Perception of low priority placed on a decision maker's project is negatively associated with his/her motivation to work on future projects.*
>
> ***H4b*** *: Perception of low priority placed on a decision maker's project is negatively associated with his/her future intent to share resources.*

Data and Methods

We designed and executed a series of interviews and experiments involving MBA students in order to examine evidence of support for the foregoing hypotheses. The method included a number of pre-experiment, during experiment, and post-experiment procedures and measurements, which we describe in the following sections.

Perceptual Scales Development

As a number of the hypotheses deal with perceptions, we sought to include pre and post-experimental perceptual scales addressing resource sharing, information visibility, and project priority, as well as measures of subjects' managerial experiences, predispositions and perceptions. The Appendix shows the scale items. Although a number of scales focusing on information and financial resource sharing have been used in past studies, scales specific to human resource sharing are less established (Gupta and Govindarajan 1986; Fisher, Maltz, Jaworski1997; Chang and Hung 2000). Exceptions of studies interested in such sharing include the recent work of Legler and Reischl (2003). We therefore base our scale for resource sharing largely on the structure of these existing scales, adjusted specifically to describe sharing activities relating to human resources in project management settings. In contrast, the information visibility scale was developed based on relatively well established concept of 'ease of access' and related concepts used in contemporary information management literature (eg. Yazici 2002; William and Wilson 1997).

The scale used for measuring perceptions of organizational project prioritization was based on our specific conceptualization of this term as capturing not just importance or commitment by the organization, but more critically the 'mutuality' of such organizational views (ie. relative to other work) as discussed in the marketing literature. Because of this we borrow from the ideas of Boyle, Dwyer, Robicheaux and Simpson (1992), in contrast to general 'support' scales used in past literature (eg. Igbaria 1990) which do not explicitly indicate the partisan issues associated with prioritization.

Scales used as control variables were similarly based on past literature when available. The items use in the project motivation scales for example were designed to mimic issues of intrinsic work enthusiasm and interest in challenging goals, as focused on by authors such as Wright and Cordery (1999) and Warr (1990). Items used in construction of the task uncertainty scale were based on scales used by Goodhue and Thompson (1995) as well as alternative views of task uncertainty demonstrated in more recent works (eg. Wright and Cordery 1999; Rai and Al-Hindi 2000).

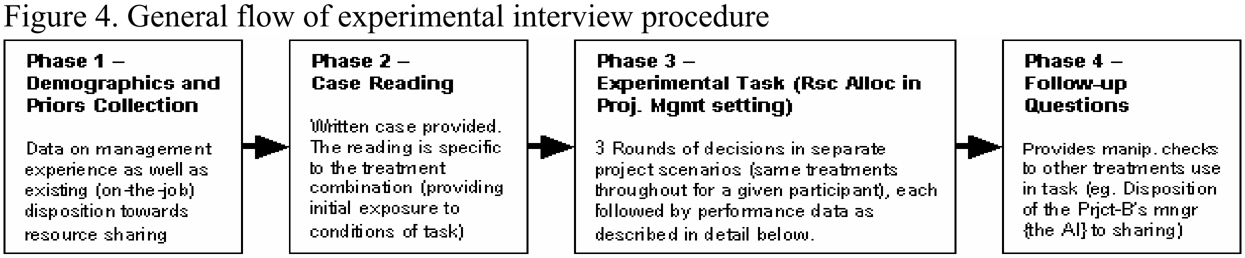
In order to ensure validity in our scale forms, a pre-experimental 3-phase Q-sort analysis was conducted (Moore and Benbasat 1991). The first phase involved four tenured faculty members of top ranked business schools, each familiar with empirical research in project management and behavioral dynamics. They provided an initial sounding board for the specific wording of our items. This phase yielded an overall hit ratio of 83%. The second group, consisting of managers not directly affiliated with either of the authors' institutions, provided a hit ratio of 89.6% to a slightly modified wording of our items (based on 1st round results and suggestions). The final wording (presented in the Appendix) gave a hit ratio of 91.6% overall among management alumni of a part-time working MBA program – i.e., most representative of our target experimental sample.

Experimental Procedure

The collection of data took place over a two month period and involved ten graduate research assistants used to conduct interview/experiments with 362 MBAs enrolled in a top tier graduate business program. The MBA target subjects were stratified by program type (eg. Part-time, Weekend, Executive, etc.) and distributed otherwise randomly to each of the RAs to ensure each RA had an approximately equal representative population to interview. All subjects targeted for this study had a minimum of 2 yrs managerial work experience. Initial contact with these MBA participants was conducted through e-mails distributed within the school's local area network with interview times set-up between the RAs and the subjects.

For all interviews, RAs were provided a detailed set of instructions of the experimental procedure to ensure consistency. For each participant, a specific pre-assigned treatment combination was provided to the interviewing RA (not disclosed to the participants). This treatment combination described whether the Excel-based testing instrument to be used in the experiment would be calibrated to either a "high" or "low sharing" (by others) setting, as well as whether it would be calibrated to either a "high" or "low information" setting for the experimental task environment. Treatment specifications followed a stratified design for each subject pool assigned to each RA and provided coverage along a full factorial design with these treatments. Ultimately each interview consisted of four phases, including the participants' activity in this task environment to be described. The overall procedural flow is summarized in Figure 4:

Figure 4. General flow of experimental interview procedure



Phase 1 consisted of preliminary data collection for use as controls in our models. The specific wording of the items, clarified through the Q-sort procedure and used in this phase, are outlined in the Appendix. Phase 2 involved providing each subject with a case reading based on the specific treatment-combination exposure assigned to that subject. An example text calibrated for the “high sharing”/ “low information” treatment is provided in the Appendix.

Phase 3 required the subjects to participate in three project management simulation scenarios, with project dynamics and decision making interactions all conducted in an Excel-based simulation environment (see Appendix for example screen shot). Each scenario involved managing a seven sequential step project supported initially by three worker resources (each qualified to work on a subset of these steps). At the onset, each step had 2 of these workers assigned to it. Estimates of completion time are provided for each step in the project being managed by the participant. As time passes these step-time estimates change to simulate uncertain conditions in each project.

Information relating to a similar project managed by another project manager in the firm, as alluded to in the written case (Phase 2), was also provided. However, the extent of this information was dependent on the experimental treatment assigned to the participant. Specifically, under the “High Information” treatment, the participant was given real-time visibility of changes in step-time estimates, step-status and resource availability. This was provided both graphically and in a running log of step completion alerts. Under the “Low Information” treatment, the participant was only provided a graphical depiction of the ‘original’ step-time estimates and expected availability times of resources, which remained static throughout any given scenario.

One of the first events to occur in each of the scenarios was a request by the other project manager to transfer one of the participant’s workers to the 2nd project. An estimate of the impact of such a transfer on the duration of both projects was provided through the simulation interface and the participant would then be required to choose whether to accept or deny the request. Since each scenario had slightly different simulated dynamics, participants would ultimately be exposed (via the interface) to three difference outcomes from such an ‘acceptance’: Positive, negative and zero net changes to the total project completion time estimates. Because of these differences the sequence of scenarios encountered by participants was always randomized to ensure the overall results of the study would not be significantly influenced by the nature of such sequencing.

Only from the point at which an ‘accept’ or ‘deny’ decision was made and until the end of the scenario would the participant be allowed to make his/her own “resource transfer request” to the other manager. The ‘sharing by others’ treatments (low vs. high) specified the reactions of the other project manager, an AI in the simulation, to resource sharing requests made by the participant. Given both ‘sharing’ and ‘information’ treatments, several possible outcomes could emerge from resource requests made by the participant. When faced with an AI that always rejected requests, the respondent was told that the project manager “… did not view your request as practical for the firm in the grand scheme” regardless of actual availability of the worker. In the ‘Low Information’ treatment, the participant would not be shown the real time status of the worker and therefore would not be able to judge whether this decision was based on availability or otherwise.

When faced with an AI that always accepted requests, and provided the worker was in fact currently available, the participant would be informed that the transfer was approved. However, even with an "accepting" AI, if the resource was not available for transfer then the transfer was not possible. In such situations, under the "High Information" treatment, the participant was told "…the resource is currently in use and cannot be redeployed. More timely requests may be better received in future projects." However here again, under the "Low Information" treatment, the participant was simply told that the transfer was not possible; he/she was not given any direct indication of why the transfer was not possible.

Following the third scenario of the experimental task phase (Phase 3), participants were asked to respond to a set of follow-up questions (Phase 4) of the interview. These questions were designed to capture impressions developed by the participants regarding the task environment as well as more general views of the firm associated with the case experiment. While some of these items were strictly used for the purpose of testing the effectiveness of the treatments (ie. treatment checks), others provided perceptual measures key to several of our hypotheses (see Appendix).

Task Outcomes: Actions and Performance

For the purpose of testing our hypotheses, a number of objective outcomes were automatically derived and recorded for each of the project management task-simulation scenarios in which the subjects participated. Global sharing behavior results when a decision maker prioritizes global performance in addition to, and perhaps above, the performance of his/her individual project. In our experimental setting, global sharing was manifested by a willingness to share resources with the other project. It was also manifested by a reticence to make requests for additional resources without a strong rationale. In both cases, these actions indicated a consideration of global performance effects that extended beyond the local project. We included three separate measures to address these two aspects of participants' global sharing behavior.

The first two measures assessed a willingness to share resources under different potential outcome scenarios. Each participant received multiple requests in the experiment, each of which may include a projected positive, zero, or negative effect of resource sharing on global performance. "Rational sharing" is a measure of the participant's sharing behavior when non-negative impacts of sharing are conveyed. For each resource sharing request made by the AI, the participant's score was 1.0 if he/she accepted the request when a positive impact on global performance was projected. The participant's score was 0.5 if he/she accepted the request when a net zero impact on global performance was projected. The second sharing measure, "social sharing," assessed the participant's sharing behavior when non-positive impacts of sharing were conveyed. The scoring for this measure was similar to the rational sharing measure, except in this case the participant's received a 1.0 if he/she accepted a sharing request when a net negative impact on global performance was projected, and a 0.5 if a net zero impact was projected. The rational sharing measure thus indicates the participant's willingness to respond to potential opportunities to improve global performance, even though the performance of his/her own project may suffer. The social sharing measure indicates the participant's willingness to share even when global performance may suffer as a result. In the case of social sharing the participant may be motivated by superordinate social considerations. The total rational sharing and social sharing scores were computed by summing across all resource sharing decisions made in the three project scenarios.

We included another measure to address the participant's reticence to ask for additional resources, out of concern for global performance. "Rational requesting" was computed as the total expected reduction in global project completion times at the point of the participant's request, given that the request was granted. The rational requesting measure indicates the degree to which the participant's request was motivated by global gains (as opposed to only local gains). The rational requesting scores were averaged across all requests made by the participant.

Two objective performance measures were derived for each scenario managed. In line with the stated objectives of the written cases, both of these were measures of lateness in project completion relative to originally provided estimates (ie. those given prior to the start of any project). "Local lateness" focused on the lateness of the project managed directly by the participant, while "Global lateness" was calculated as the sum of lateness across both Project A and Project B in any given scenario.

Analysis and Results

Overview of Respondents and Data

Of the 362 potential subjects, 229 were willing to fully participate in the interview/ experiments and provided complete responses to the items (60.7% response rate). The average number of years experience across the respondents was 3.42. The median number of employees supervised over this length of time was 5. For the 'Low information' treatment 56 respondents were involved in the 'Low sharing by others' exposure, with another 59 exposed to the 'High sharing' cross-treatment. The 'High information' treatment sample was split 58 ('Low sharing') and 56 ('High sharing'). Participant demographics did not differ significantly across the treatments. Furthermore, no significant differences in the frequency of the 3-scenario randomized sequencing were detectable among any of the treatment-level combinations.

Table 1 provides correlations of the key objective and subjective measures collected in this study, as well any relevant correlations among control variables. Scale reliability, also displayed in Table 1, was evident from the relatively high alpha values across all subjective scales (Nunnally and Bernstein 1994). Confirmatory factor analysis (CFA), using SAS's PROC CALIS procedure was performed to assess unidimensionality across the 8 self reported measures denoted in Table 1. Goodness-of-fit (GFI) and Comparative fit (CFI) indices for these factors met the >0.90 criteria established by past literature (Bollen 1989; Hatcher 1994). Following the procedure used by Stratman and Roth (2002), discriminant validity for these factors was assessed. The $\Delta\chi^2$ values drawn from pair-wise nested CFA models were significant at the $p<0.001$ level, thus demonstrating adequate distinctions among the factors and assuaging colinearity concerns (Koufteros 1999).

Table 1. Descriptives of main variables included in analysis
(significant correlations with controls list separately below)

	[0,1] Treatments		Actions			Performance		Self Reports							
	AI Resource Sharing	Information Visibility	Rational Sharing	Rational Requesting	Social Sharing	Local Project Lateness	Global Lateness	*a*	*b*	*c*	*d*	*e*	*f*	*g*	*h*
Rational Sharing	.246 **	.347 **													
Rational Requesting	.274 **	.221 *	.220 *												
Social Sharing	.167 *	.095	.063	-.026											
Local Project Lateness	-.204 *	-.156	-.144	-.187 *	.018										
Global Lateness	-.213 *	-.142	-.321**	-.265 **	-.241 **	.204 *									
a) Perception of Low Priority (in-task)	-.290 **	-.088	-.159	.047	.082	.285 **	.184 *								
b) Task Uncertainty (in-task)	.036	-.199*	-.113	-.059	-.089	.072	.124	.183*							
c) Future Project Motivation	.120	-.037	.111	-.017	.082	-.079	.001	.095	-.045						
d) Future Resource Sharing Intent	.118	-.024	-.062	.086	.050	.071	.085	.118	-.027	-.063					
e) Prior Project Motivation (on-the-job)	.013	.030	.057	-.046	.130	.125	.056	.097	-.100	.005	-.101				
f) Predisposition to Sharing (on-the-job)	-.094	-.020	.192*	-.087	.212*	-.024	-.154	-.072	.087	-.052	.002	.089			
g) Prior Sharing by Others (on-the-job)	.064	.071	.102	-.169*	-.020	-.089	-.031	.119	-.044	.102	.031	.037	.107		
h) Prior Perceptions of Low Priority (on-the-job)	.061	.015	.072	.095	.081	.039	.109	.230*	-.044	.028	.015	.036	-.094	-.042	
Mean			0.796	9.17	0.977	18.20	21.90	4.42	4.78	5.13	5.01	5.24	5.19	4.27	4.05
Std Dev			0.314	4.62	0.424	8.91	7.67	1.53	1.21	0.72	0.78	1.01	1.16	1.62	1.40
Chronbach's α								.876	.821	.789	.810	.844	.801	.909	.793
GFI								.951	.967	.963	.946	.952	.958	.934	.930
CFI								.984	.972	.994	.983	.984	.997	.968	.980

*** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).*

Three separate treatment checks were conducted to ensure that the treatments applied in the experiment were in fact effective in creating impressions in the minds of the participants with regards to the specific contextual elements we were focusing on (See Table 2). Post-hoc manipulation checks supported the adequacy of both experimental treatments by revealing significant differences in perceptions of their respective Phase 4 perceptual gauges (Cook and Campbell 1979; Perdue and Summers 1986). Confounding checks, recommended by Wetzel (1977), similarly supported clarity in the intended treatment effect by showing no significant differences in 'information visibility' responses between 'low' and 'high sharing' treatments, as well as no significant differences in 'resource sharing' perceptions between 'low' and 'high information' treatments. Hawthorne checks (Adair 1984) against extraneous perceptual effects of these treatments was conducted using supplemental items not viewed as relevant to this study but included in the Phase 4 items for this sole purpose. Again no significant extraneous impacts were detected.

Table 2. Treatment Checks (t-Tests)

			AI Resource Sharing			Information Visibility		
Subjective Scales	Mean (SD)	α Reliability	Mean at AI Resource Sharing =0	Mean at AI Resource Sharing =1	p-level	Mean at Information Visibility =0	Mean at Information Visibility =1	p-level
Resource Sharing by Others (in-task)	4.18 (1.4)	0.832	5.18	3.23	0.001; M	4.21	4.18	0.815; C
Information Visibility (in-task)	3.72 (1.5)	0.825	3.73	3.71	0.884; C	3.35	4.12	0.002; M
Supplemental Issues (in-task)	4.16 (1.3)	0.803	4.21	4.11	0.675; H	4.14	4.18	0.761; H

Shorthand for test-comparison interpretation in above table:
M=Manipulation Check; C=Confounding Check; H=Hawthorne Check

Information as a Behavioral Moderator

We executed both MANCOVA and ANCOVA to investigate support for H1a and H1b. H1a states that visibility of situational information will positively affect a participant's resource sharing behavior. Table 3 reports the results of analysis of variance for the experimental treatments. The MANCOVA results show that, after controlling for participants' predispositions and perceptions, the information visibility treatment significantly affects subjects' sharing behaviors as a set. The ANCOVA results indicate that the significant effects of information visibility pertain to rational sharing and rational requesting behaviors. The effect of information visibility on social sharing is not statistically significant. Thus, H1a is partially supported.

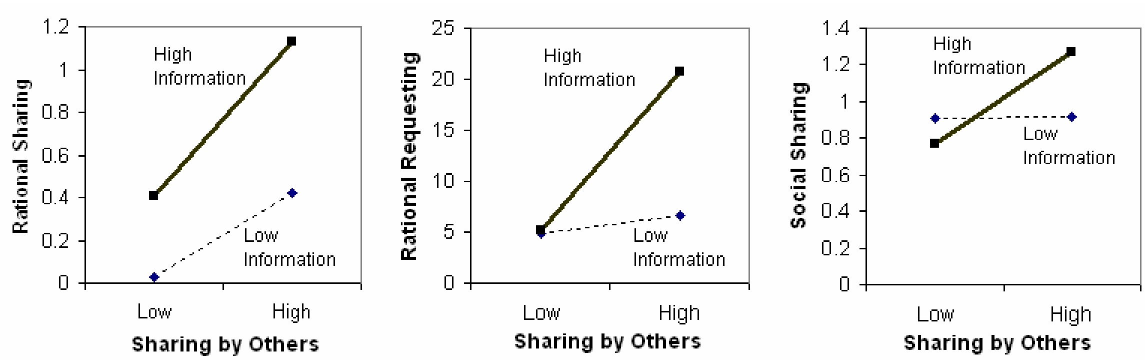
H1b states that situational information will positively moderate the effect of the sharing behavior of another upon the participant's sharing behavior. Table 3 indicates that the interaction of information visibility and AI sharing is statistically significant for all three of the sharing behavior measures. Figure 5 illustrates the interactions. In each case, the effect of AI sharing on the participant's sharing behavior was clearly amplified by information visibility. That is, positive sharing by the AI increased the participant's global sharing behavior to a much greater degree when situational information was visible to the participant. These positive and significant interactions strongly support H1b.

Table 3. Analysis of covariance for experimental treatments

	MANCOVA		ANCOVA					
			Rational Sharing		Rational Requesting		Social Sharing	
	p	η^2	p	η^2	p	η^2	p	η^2
Mains and Interactions								
Information Visibility	0.019	0.040	0.005	0.027	0.045	0.017	0.382	0.007
			MM_0 = 0.23 (0.07) MM_1 = 0.77 (0.06)		MM_0 = 5.72 (1.98) MM_1 = 12.89 (2.05)		MM_0 = 0.92 (0.06) MM_1 = 1.02 (0.07)	
AI Resource Sharing	0.000	0.166	0.000	0.131	0.004	0.028	0.016	0.022
			MM_0 = 0.22 (0.04) MM_1 = 0.78 (0.04)		MM_0 = 5.00 (2.06) MM_1 = 13.65 (1.99)		MM_0 = 0.84 (0.07) MM_1 = 1.10 (0.06)	
Information Visibility x AI Resource Sharing	0.000	0.241	0.022	0.020	0.000	0.110	0.018	0.021
			MM_{00} = 0.03 (0.06) MM_{10} = 0.41 (0.06) MM_{01} = 0.42 (0.06) MM_{11} = 1.13 (0.07)		MM_{00} = 4.82 (2.94) MM_{10} = 5.18 (2.86) MM_{01} = 6.60 (2.76) MM_{11} = 20.71 (2.91)		MM_{00} = 0.91 (0.09) MM_{10} = 0.77 (0.09) MM_{01} = 0.92 (0.09) MM_{11} = 1.27 (0.09)	
Covariates								
Previous Project Motivation Level (on-the-job)	0.019	0.038	0.416	0.007	0.551	0.005	0.820	0.003
Pre-disposition to Sharing (on-the-job)	0.002	0.062	0.031	0.019	0.247	0.009	0.010	0.024
Previous Sharing by Others (on-the-job)	0.128	0.037	0.889	0.003	0.119	0.012	0.296	0.008
Prior Perception of Low Priority (on-the-job)	0.211	0.032	0.438	0.006	0.223	0.009	0.267	0.009
Task Uncertainty (in-task)	0.236	0.031	0.389	0.007	0.930	0.003	0.404	0.007

MANCOVA F-based p-level's and partial η^2 values based on Wilks' Lambda approach
Note: MM's are marginal means for each treatment level; Standard deviations are shown in parentheses. For the interactions MM_{01} represents the marginal mean for Low Information and Sharing-by-Others(AI), while MM_{10} represents the marginal mean for High Information and Non-Sharing-by-Others(AI)

Figure 5. Interactions of information visibility and AI sharing



Behavioral Mediation of Informational Impacts

We used hierarchical regression to evaluate H2, which describes a mediating relationship in which the participant's global sharing behavior serves as the primary generative mechanism by which situational information affects task performance. Three tests are required in order to establish that a variable, *b*, mediates the relationship between two variables, *a* and *c*. First, *a* must be significantly associated with *b*. Second, the relationship of *a* to *c* must be established. Third, the relationship of *a* to *c* must change significantly when *b* is entered into the regression model (Baron and Kenny, 1986).

In Table 4, the "Direct Model" as shown for both for local project lateness and for global lateness indicates that the direct effect of information visibility on both lateness measures is significantly negative. Thus, the presence of information visibility reduces both types of lateness. However, when global sharing behavior variables are entered into the regression models (see Model A and Model B), the coefficient of the information visibility term becomes non-significant, thus indicating a significant mediation effect. The results support H2, which suggests that sharing behaviors are the important means by which information visibility influences task performance. This finding is consistent for both local project and global lateness. Interestingly, rational sharing (Model A) and rational requesting (Model B) are associated with both local and global lateness in the expected direction (more sharing decreases lateness). However, social sharing (Models A and B) is significantly associated only with global lateness. Social sharing has a nominally positive association with local project lateness (i.e., social sharing increases lateness), though the term misses statistical significance.

In sum, global sharing behaviors appear to produce benefits to global performance without significant detriment local project performance. Rational sharing behaviors improve both local and global performance. Social sharing behavior improves global performance, though it may have the potential to degrade local performance. In these ways sharing behaviors fully mediate the influence of information visibility on local and global project lateness.

Table 4. Hierarchical regression of performance measures on information visibility and sharing behavior.

	Local Project Lateness						Global Lateness					
	Direct Model		Mediation Model A		Mediation Model B		Direct Model		Mediation Model A		Mediation Model B	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
Constant	18.7*	(9.44)	20.3**	(3.64)	19.7**	(4.04)	22.5*	(11.72)	22.4**	(3.81)	19.9**	(3.77)
<u>Primary I V s</u>												
Rational Sharing			-4.24*	(2.77)	--	--			-6.82**	(1.71)	--	--
Rational Requesting			--	--	-0.18*	(0.09)			--	--	-0.13**	(0.04)
Social Sharing			1.99	(1.38)	2.20	(1.42)			-1.63*	(0.79)	-1.51*	(0.69)
AI Resource Sharing			-2.72*	(1.21)	-2.39*	(1.10)			-2.35*	(0.99)	-2.31*	(1.06)
Information Visibility	-3.34*	(1.80)	-1.17	(1.46)	-1.63	(1.48)	-3.54*	(1.71)	-0.78	(1.21)	-1.66	(1.52)
<u>Controls</u>												
Previous Project Motivation Level (on-the-job)	-0.98*	(0.48)	0.21	(0.32)	0.62	(0.70)	-0.34	(0.91)	-0.13	(0.30)	0.34	(0.61)
Pre-disposition to Sharing (on-the-job)	0.44	(0.78)	-0.31	(0.53)	-0.27	(0.99)	0.03	(0.69)	0.21	(0.39)	-0.15	(0.31)
Previous Sharing by Others (on-the-job)	0.31*	(0.46)	0.07	(0.26)	0.88	(0.67)	0.45	(0.62)	0.49	(0.61)	0.52	(0.77)
Prior Perception of Low Priority (on-the-job)	0.53	(0.75)	0.10	(0.29)	0.49	(0.60)	-0.29	(0.84)	0.33	(0.31)	-0.13	(0.38)
Task Uncertainty (in-task)	0.38	(0.60)	0.49	(0.54)	0.57	(0.32)	0.49	(0.77)	-0.02	(0.44)	0.22	(0.38)
R^2 for model with <u>only</u> controls	0.024						0.013					
R^2 for model with controls and Information Visibility	0.038						0.024					
ΔR^2 after Primary IVs (first 4 excluding Info Visibility) introduced into models with <u>only</u> controls			0.288**		0.274**				0.273**		0.169**	
ΔR^2 after Information Visibility is added to model with all other IVs and controls			0.007		0.005				0.008		0.003	

Information as a Rationalization Moderator

H3a and H3b state that information visibility moderates the effects of task-performance and the sharing behavior of others on post-task perception of prioritization. We used hierarchical moderated regression models to test these hypotheses. Moderated regression analysis is preferred over subgroup analysis as it maintains the integrity of the sample data (Zedeck, Cranny, Vale, and Smith, 1971).

The significant interaction terms in Table 5 provide support for H3a and H3b. Local project lateness and global lateness are each positively associated with a perception of lower priority placed on the participant's project. However, the significant negative interactions of these variables with information visibility indicate that in each case the presence of information offsets the influence of performance on perception, thus supporting H3a. The results indicate a similar finding for H3b. Increased sharing by the AI is associated with less of a perception of low priority. The significantly positive interaction term for information visibility and AI sharing indicates that this association is reduced when information is present.

Table 5. Hierarchical moderated regression of perception of low priority on project performance, information visibility, and AI resource sharing.

	Perception of Low Priority (in-task)			
	Model A		Model B	
	Mean	(SD)	Mean	(SD)
Constant	3.82*	(1.61)	3.50*	(1.69)
Primary I V s				
Local Project Lateness	0.083**	(0.027)	--	--
Global Lateness	--	--	0.076*	(0.015)
AI Resource Sharing	-0.92*	(0.26)	-0.87*	(0.23)
Information Visibility	-0.23	(0.18)	-0.19	(0.17)
Interactions				
Information Visibility x Local Project Lateness	-0.062**	(0.020)	--	--
Information Visibility x Global Lateness	--	--	-0.031*	(0.014)
Information Visibility x AI Resource Sharing	0.84*	(0.28)	0.75**	(0.15)
Controls				
Previous Project Motivation Level (on-the-job)	-0.06	(0.11)	-0.01	(0.10)
Pre-disposition to Sharing (on-the-job)	0.10	(0.09)	0.14	(0.09)
Previous Sharing by Others (on-the-job)	0.12	(0.13)	0.16	(0.14)
Prior Perception of Low Priority (on-the-job)	0.50*	(0.22)	0.56*	(0.24)
Task Uncertainty (in-task)	0.45	(0.35)	0.71*	(0.38)
R^2 for model with only controls	0.087		0.107	
ΔR^2 after Primary IVs (excluding Information Visibility) are introduced into models with only controls	0.085*		0.092*	
ΔR^2 after Information Visibility is added to model with all other IVs and controls	0.002		0.004	
ΔR^2 after Interaction terms are added to model with all IVs and controls	0.127**		0.135**	
ΔR^2 after only Information Visibility is introduced into models with only controls	0.010		0.008	

Rationalization as a Predictor of Future Intent

H4a and H4b state that a participant's post-task perception of the priority will affect his/her future sharing intentions as well as his motivation to work on future projects. The regression analysis results shown in Table 6 strongly support both hypotheses. Perception of low priority placed on the participant's project is significantly and negatively associated both with future resource sharing intent and with future project motivation.

Table 6. Regressions of future intention variables on project performance and priority perception variables.

	Future Resource Sharing Intent				Future Project Motivation			
	Model A		Model B		Model C		Model D	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
Constant	1.98**	(0.34)	1.93**	(0.37)	2.81**	(0.31)	2.87**	(0.33)
Primary I V s								
Local Project Lateness	-.021*	(0.009)	--	--	-.029**	(0.008)	--	--
Global Lateness	--	--	-.024*	(0.009)	--	--	-.035**	(0.009)
Perception of Low Priority (in-task)	-.41**	(0.16)	-.39*	(0.17)	-.47**	(0.16)	-.44*	(0.18)
Controls								
Previous Project Motivation Level (on-the-job)	0.18	(0.12)	0.16	(0.11)	0.36**	(0.09)	0.35**	(0.09)
Pre-disposition to Sharing (on-the-job)	0.35*	(0.06)	0.34**	(0.05)	0.13	(0.09)	0.12	(0.08)
Previous Sharing by Others (on-the-job)	-0.42*	(0.23)	-0.40*	(0.21)	-0.25*	(0.13)	-0.20	(0.15)
Prior Perception of Low Priority (on-the-job)	-0.19	(0.12)	-0.21	(0.14)	-.33*	(0.17)	-.31*	(0.18)
Task Uncertainty (in-task)	-0.18	(0.48)	-0.28	(0.51)	0.01	(0.61)	-0.36	(0.55)
R^2 for model with only controls	0.181**		0.181**		0.204**		0.204**	
ΔR^2 after Primary IVs are introduced into models with only controls	0.169**		0.150**		0.192**		0.174**	

Discussion

This study points out the significant role that information plays in determining the behavioral aspects of decision making and performance in a multi-project resource management setting. Further, it demonstrates that information can serve to moderate decision makers' perceptions regarding project task dynamics. Collectively, the theoretical extensions supported by our findings provide the background for a richer (and testable) understanding of information effects in organization settings involving multiple parallel tasks. They may also provide a mechanism for predicting subsequent behavior in such settings.

In many decision making environments, managers are often faced with options that maximize either local or global outcomes. Their choices cannot be fully explained by rational decision processes; perception and social behaviors (such as reciprocity) also play a role in determining their actions. In situations characterized by high levels of uncertainty and limited information, decision makers may attribute behaviors of others to non-rational causes. Such an attribution may then lead the decision maker to act in ways that are not in the best interest of the overall task nor to the firm as a whole.

Findings and Implications

Interestingly, the findings of our study suggest that situational information visibility offers to decision makers a broader understanding of interrelated activities and greater insights into the causes for situations that affect them. This added understanding increases rational resource sharing and rational resource requesting behaviors, which in turn produce benefits to both local and global performance. In fact, most of the significant effect of information visibility on task performance was mediated (explained) by changes in rational sharing behaviors. Moreover, information visibility increases the effect of others' sharing behaviors on both rational and social sharing. Social sharing behavior improves global performance, without significant effect on local performance.

Our findings also suggest that the presence of information can influence future project task performance as well as immediate task performance. Information visibility offsets the influences of current task performance and co-worker sharing on the decision maker's priority perceptions, possibly even misguided perceptions which may significantly influence the decision maker's future intent and motivation.

The implications of these findings are multifold. First of all, limited, local information visibility in project management is insufficient in the pursuit of across-the-board performance in such tasks. Not only is the effect of information visibility on performance mediated by actions taken, a lack of global visibility can have both negative short- and long-term consequences on work and management behavior. Firms should therefore consider mechanisms that permit sufficient transparency across simultaneous projects to managers charged with resource management responsibility. Such transparency can permit managers to more easily evaluate resource sharing options at a global level as well as reduce risks of misattributing project difficulties to elements of organizational climate.

As an additional point, the dynamics observed in the experimental context imply that while increased information availability and process visibility can have positive effects on task performance (i.e., reduce project lateness), it is crucial to augment such information availability with organizational structures that identify sharing opportunities, clarify the constraints that individual managers have on their sharing decisions, and encourage sharing when such actions are oriented towards management objectives (e.g., global performance measures)**.** Another consideration affecting the implementation of such situational information elements in decision support systems is their affects on complexity and information load (Campbell, 1988; Newell & Simon, 1972; Card, Moran, & Newell, 1983). While information may clarify interrelationships among parallel tasks, it is conceivable that massively parallel task environments (e.g., many simultaneous projects) may involve "too much" information.

<u>*Future Research*</u>

The experimental setting employed in this study involved only two projects, and the global performance metric assigned equal weight to each project. In actual multi-project environments many projects may be concurrently executed. It would be interesting for future research studies to examine the point at which additional information load begins to degrade the positive moderating attributes of information which describes the details of an increasingly large set of projects (Swink and Robinson, 1997; Swink and Speier, 1999). Further, projects are likely to differ in their respective value contributions to the firm. It would also be useful to examine the degree to which added complexity in performance metrics (e.g., project weighted global performance calculations) would begin to cloud the "informed rationality" enabled by greater information. Yet another aspect of complexity is the degree of interactivity among decision makers. We speculate that information visibility might be even more important in complex project environments where inter-project dependences go beyond resource sharing to include aspects such as cross-project learning and capability development.

In order to extend this study, future research should also examine the effects of information on other project outcomes. Our study focused on project lateness. However, other outcomes such as resource utilization, productivity, and quality are also of interest. In addition, our findings suggest that benefits from situational information in projects may extend to post project outcomes. For example, greater presence of situational information throughout a project's execution may lessen requirements for project post processing (e.g., post mortem analysis) as a means of managing perceptions. Benefits may also extend to desirable social outcomes such as increased morale, motivation, and esprit de corps.

Conclusions

We were motivated to do this research by the lack of behavioral considerations in prior research studies of resource interdependent settings such as project management. In addition, we were intrigued by the notion that information availability's effects on performance may extend beyond immediate task-related outcomes. This study indicates that such effects are potentially salient. Situational information availability not only affects immediate project timeliness, it also impacts decision makers' perceptions of the actions and priorities of other organizational actors. Since these perceptions affect future behavior and future task performance, investments in technologies which provide increased information visibility should be considered to be high leverage investments. We consider these findings to be especially relevant given the rapid evolution of modern IT infrastructures capable of disseminating task-related information more effectively.

In addition to the limitations noted earlier, other primary limitations of this study pertain to the practical constraints of experimental methods. In many cases decision makers may face more complex decision environments than those simulated by our experimental environment. Future research may determine that situational information may play even more important roles for more complex decisions. As mentioned earlier, we focused on a common, single decision objective, whereas in many project management environments trade-offs among goals may cloud decisions. Lastly, we did not address measures of information system success such as user satisfaction or ease of communication. We leave it to future research to address these limitations as opportunities to extend our research findings.

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Appendix

Pre-Task Questions used in this study ***(Phase 1)***

Sample demographic items:
What was your most recent managerial appointment?: *{sample validity check}*
What was length of the above appointment/job (in years)?: *{control}*
How many workers would you say you had responsibility for during this length of time?: *{control}*

To what extent do you agree with the following statements regarding the appointment/job you described above: [1-5 Likert-type scales]

Prior Project Motivation of Participant *{control}*

a) When involved in projects at your firm, you brought a high level of enthusiasm to the work
b) You looked forward to opportunities for leadership roles in projects conducted at your firm
c) In projects at your firm, you were consistently motivated to ensure quality in work assigned

Prior Resource Sharing by Participant *{control}*

a) You were fully willing to allow those below you to work for others whenever requests were made
b) You encouraged the exchange of information with others to promote effective worker utilization
c) You focused your labor-resource decisions on the objectives of the firm rather than your own

Prior Resource Sharing of Others *{control}*

a) Other managers seemed generally unwilling to share their worker resources with you
b) Regardless of your efforts, other managers did not seem obligated to take your needs seriously
c) In this firm, other managers seemed to be predisposed to refusing your requests for assistance

Prior Perception of Low Priority *{control}*

a) Your projects were treated with less priority than other projects by managers in the firm
b) In this firm, other projects were generally looked on as more important than your own
c) Other managers felt it was crucial to focus on the performance of projects other than your own

Sample Case [for "Low Information" treatment] ***(Phase 2)***

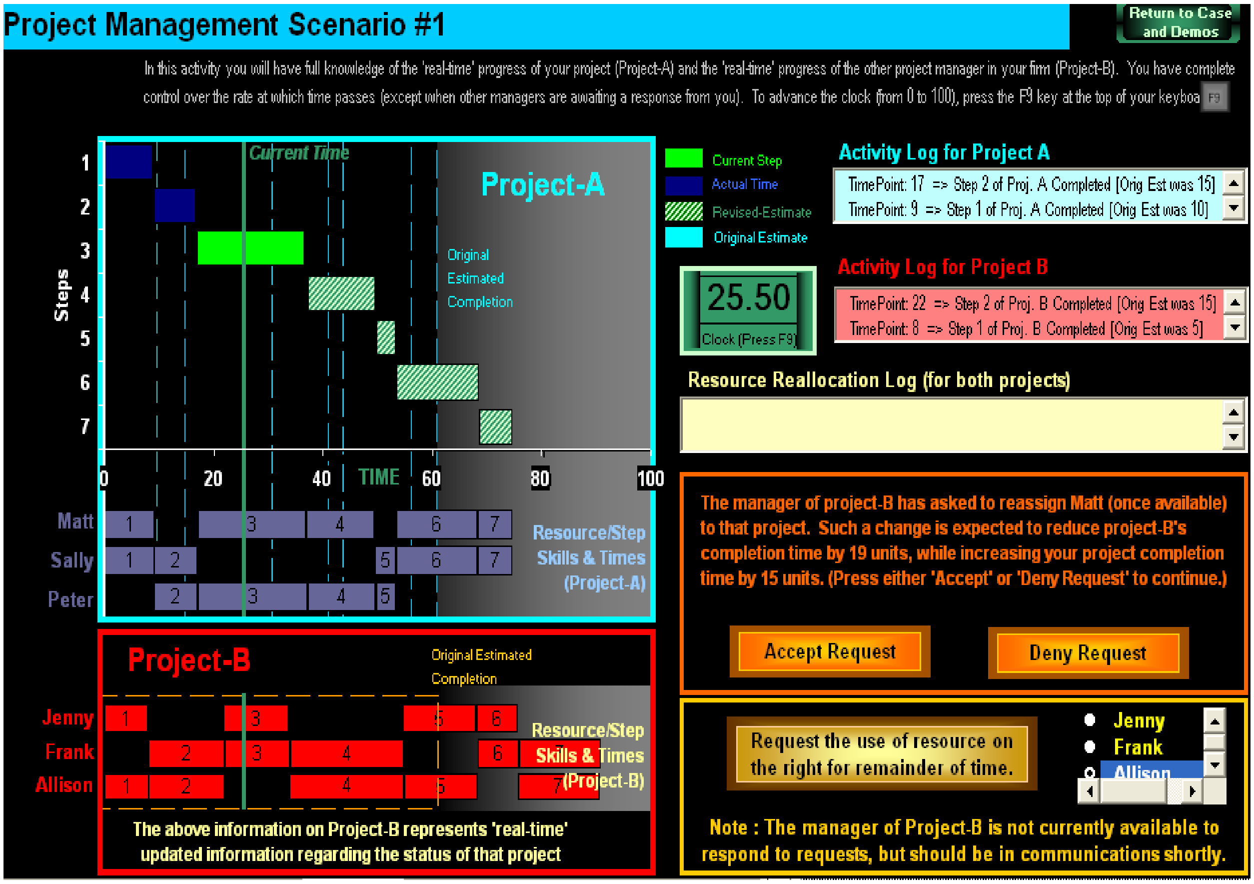
Imagine yourself in the role of a project manager at a firm. At any point in time the firm can have up to two projects running simultaneously. While your position in the firm places you in charge of limited resource decisions for one of these projects (eg. Project-A), another manager at the firm has comparable authority regarding any other project running at the same time (eg. Project-B).

The firm finds the other project manager to be a valuable asset, and in the past this individual and his team have been very willing to help other employees out, share their expertise, prevent problems with other employees, give of their time, and touch base to avoid creating problems. Because of the firm's desire to provide timely completions for both projects, one of the most important decisions that performance as a project manager is based on involves the allocation of workers in these projects (this is true for both you and the other project manager). For each project you manage in the activity to follow, you will be given one chance to respond to a request by the second manager for a reallocation of one of your project team members to their project, and will have the opportunity to make a similar request to that manager (only after you have responded). Your final performance will be based on the extent to which both your project and that of the other manager are completed by the original time estimates. Lateness will detract from your performance rating.

All projects involve 7 sequential steps, and are originally designed to involve 3 workers. Anticipated completion times and resource assignments are always provided for each step at the start of these projects, though experience has shown that the actual time to complete each step can vary as projects progress. To facilitate you resource decisions, you will be given real-time details regarding the status of your project steps and worker activities relative to original project estimates. You will also have the original estimates for the firm's other simultaneous project developed by the manager of that project.

You will be interacting with this other manager over a total of three projects (ie. 3 interactive scenarios, one after the other) under your management. While the other manager will always have the opportunity to ask for resources from you before you make your requests, as compensation you will have complete control over the pace at which 'time' progresses in these activities (through the use of the F9 key on your keyboard).

<u>Screen Clip [for "High Information" treatment]</u> (Phase 3)



<u>Task Measures used in study</u> (Phase 3) {Objective DVs and IVs}

<u>Objective Performance Measures [continuous measures]:</u>
Local Project Lateness: Total time 'past' original completion times [or % of original] (ie. extent of early completion not valued)
Global Lateness: Total time 'past' original completion times [or % of original] (ie. extent of early completion not valued)

<u>Objective Focused Action Measures [mixed see below]:</u>

Rational Sharing: 1 Point if accept AI's "sharing request" under the stated prediction of positive Net Global benefit +0.5 Point if accept AI's "sharing request" under the stated prediction of a 'zero' Net Global impact [0, 0.5, 1, 1.5 range]
Social Sharing: 1 Point if accept AI's "sharing request" under the stated prediction of a Net Global loss +0.5 Point if accept AI's "sharing request" under the stated prediction of 'zero' Net Global impact [0, 0.5, 1, 1.5 range]
Rational Requesting: Total expected reduction in project completion times at point of participant's request, assuming it would be accepted (estimates based on information displayed only) [continuous]

***Post-Task Questions used in this study* (Phase 4)**
[Note that several in-task and future intent scales use nearly identical items as those in pre-test scales; Rather than duplicate text, we denote this mirroring through short-hand below]
[All are 1-5 Likert-type scales]

Consider the project management scenarios you have just completed…
Task Uncertainty *{control}*
a) The objectives of the project management task were not well defined
b) The series of issues I confronted in the task were difficult to anticipate
c) The dynamics of the task environment limited my ability to determine which actions would be of the greatest benefit

To what extent do you agree with the following statements regarding this activity:
Information Visibility (in Task) *{manipulation/confounding check}*
a) You had information that helped explain the rationale behind managerial responses to your requests
b) Your were aware of the changing project-status and difficulties faced by other project managers
c) The project management interface provided info regarding the real-time availability of resources in projects other than your own

Resource Sharing by Others (in Task) *{manipulation/confounding check}*
[mirrors pre-task scale, though reverse coded]

Perception of Low Priority (in Task) *{subjective DV}*
[mirrors pre-task scale]

Supplemental Issues *{subjective items not studied; Hawthorne checks}*
Although the following issues did not impact project completion times in this specific task, how would you rate the importance of these issues overall:
a) The establishment of supplier brand-names as a selection criteria for project input sourcing
b) The alignment of the project objectives to general requirements of the firm's targeted market
c) Ten-year projections of trends in the cultural diversity of the firm's labor market

Critical Limitation of Task *{post-hoc validity check}[single selection]*
Which of the following was likely the greatest limit to your performance in this activity?:
a) Insufficient real-time information regarding other projects
b) The other manager's personal unwillingness to share resource
c) The firm's tendency to prioritize other projects above your own

Future Resource Sharing Intent *{supplemental subjective DV}*
[mirrors pre-task scale]

Future Project Motivation Intent *{supplemental subjective DV}*
[mirrors pre-task scale]