

# Altering Rationality: The Impact of Group Support Systems and Style of Leadership

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## Abstract

*This study focuses on the mitigating effect of group interaction using a group support system (GSS) and a leadership style on individual self-interest in a resource allocation setting. Using a controlled laboratory experiment, individuals' decisions when group members communicate via computer that allows synchronous communication are examined; where all comments are stored in a single location and updated in real-time.*

*The research also focuses on the effect of leadership style on the individual resource allocation decisions by considering if the effects of GSS will be different depending on the style of leadership. This study contributes to behavioural management accounting literature in two ways. First, it considers the impact of GSS in directing personal perceptions regarding resource allocation decisions. The expected findings allow the conclusion that both self-interest and social preferences are guiding motivational factors of individual behaviour. Secondly, this study sheds light on the process of how leadership style provides logical explanations on how employees undertake activities motivated by their self-interest or their care for organisations to which they belong.*

## Keywords

**Group Support System  
Style of Leadership  
Rationality**

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## Introduction

The body of literature has not yet provided complete explanations pertaining to how individuals behave during the resources allocation process of companies. Specifically, extant studies have been based on behavioural assumptions that are subject to potentially egocentric biases. While research shows that self-interest is a valid assumption to explain people's behaviour, individuals also possess a tendency to violate the assumption in their lives (Bigus, 2012). A great number of studies demonstrate that individuals behave in a way that defies the economic rationality assumption (e.g., Nahartyo, 2013; Chang, Cheng, and Trotman, 2008).

One potential factor that can mitigate self-interested behaviour is group influence. Human decision making in the real world is virtually embedded in a social environment. Certain decision problems and tasks are beyond the scope of an individual, or even a collection of individuals lacking the distinct characteristics of groups. Many decisions are made after some consultations with others, even if they are not explicitly part of a group decision-making process (Reyniers and Bhalla, 2013). Studies find that whenever an individual joins a group, he or she will constantly try to assess whether he or she and the group suit each other. If they do, then he/she will develop commitment that can lead to the best result creation (e.g., Davis, DeZoort, and Kopp, 2006; Towry, 2003; King, 2002).

Group influence may exist in a group interaction process that takes form in physical or virtual communication processes (Lynch, Murthy, and Engle, 2009). An innovative development in information systems technology has been the Group Support System (GSS). GSS is an interactive computer-based system which combines communication, computer, and decision technologies to support the formulation and solution of unstructured problems by a group (Briggs, Nunamaker, and Sprague, 1998).

Team members can share their ideas simultaneously through a network of computer workstations. The system immediately makes all these contributions available to other

members of the team who can read them on their individual screens. Nowadays, many public accounting firms and companies employ GSS in their decision making process.

The primary use of GSS is the ability of group members to make decisions without collective physical presence and the electronic accessibility of geographically dispersed people. GSS has become the backbone of group decision making in business environments (e.g., Lee et al., 2002; Smith, 2003).

GSS has been providing a new perspective in the field of research, particularly in the domains of auditing (e.g., Murthy and Kerr, 2004; Arnold et al., 2000; Bamber, Hill, and Watson, 1998), strategic management (e.g., Ackermann and Eden, 2011), communication (e.g., Murthy and Kerr, 2003), and information systems (e.g., Lee and Dennis, 2012; Jongsawat and Premchaiswadi, 2011). We note that most of early DSS research in accounting was conducted in the auditing area (e.g., Schultz and Reckers, 1981; Reckers and Schultz, 1982) and still very limited in the management accounting domain (Beaman and Richardson, 2007).

Previous research shows that GSS is primarily used for ideas generation but other areas are still in great need of research (Arnold et al., 2000). Past findings are also inconclusive pertaining to the use of GSS in various aspects of decision making behaviour, some report positive effects of GSS while the others find the opposite (Murthy and Kerr, 2004). Arnold et al. (2000), for example, find that decision making using a GSS is better than individual decision making; however, they further argue that GSS based decision making is not as effective as face-to-face group decision making. On the other hand, considerable research in the information systems literature has established that GSS is superior to face-to-face communication, especially in the context of idea generation tasks (Murthy and Kerr, 2003). The superior performance of GSS based decision has been largely attributed to parallel communication, which allows people to provide ideas simultaneously without having to wait their turn (as in face-to-face communication).

Birnberg (2011) concludes that there are still a large number of questions regarding GSS

research based on the inconclusive findings mentioned above. In this study, we compare individual decision-making in solitary situations to that in situations with salient group-membership intensified by the use of GSS in a management accounting context. We posit that without group interaction, individuals are more likely to be influenced by biases and cognitive limitations. If individuals are subject to group pressure and there exists a socially desirable resource allocation, then this can affect their decisions. Here we examine individuals' decisions where group members communicate via computer that allows synchronous communication with all comments stores in a single location updated in real-time. Our study allows us to compare the results of individuals' decision process in the presence or absence of GSS. As Murthy and Kerr (2004) point out, today many people use GSS daily and this trend is expected to continue into the future, making computer-based group interaction an ever more externally valid and important research method. As GSS becomes more common and natural, we expect it to become more and more similar to face-to-face interaction, both in terms of decision outcomes and processes. The concept of leadership is a significant theme in management accounting literature nowadays (Harris and Durden, 2012). In the past, management accounting researchers put a little attention on the field, but in recent years leadership style has been addressed in a great numbers of papers in management accounting contemporary research. The existence of leadership in management accounting literature has created few arguments that this subject is not an important aspect of effective management.

Body of literature suggests that leadership is no different from the social influence processes occurring among all members of a group (Yukl, 1989). When the United States acknowledged the need to make major changes in the way business was done to survive in the middle of fierce competition in 1980s, many researchers suddenly became very interested in leadership and its role in transforming and revitalising organisations. Research puts focus on a number of types of leadership. Transformational leadership, as one of the types, is examined in relation to job performance and effective management (e.g., Viator, 2001). Transformational leaders are theorised to influence their followers by

heightening followers' self-awareness, instilling a sense of purpose and mission in followers, and influencing them to transcend lower-order needs and goals for the sake of the long-term benefit of the group to which they belong (Bass, 1985). Research compares the effectiveness of transformational leadership with that of traditional supervision (i.e. transactional leadership).

The dynamic nature of management accounting provides an innovative setting where transformational leadership should be an effective management tool. The extant literature suggests that transformational leadership promotes positive social behaviour as this leadership type motivates subordinates to transcend their own self-interests for the good of the organisation (Yukl, 1989). Yuwen and Richards (2013) finds that transformational leadership climate is associated with employees' intention to share knowledge. Transformational leadership climate increases this intention partially by mitigating the negative impact of self-interest. Hoffman et al. (2011) find that group-level effect of transformational leadership on work group effectiveness is fully accounted for by the group-level impact of transformational leadership on follower perceptions of person-organisation value congruence.

Yukl (2012) notes that research on the effects of ethical and responsible leadership is still very limited, and more research is needed to identify relevant behaviours and assess their short-term and long-term effects. Further, he points out that strong research methods should be used more often, including experiments with manipulation of leader behaviours in simulated teams or organisations to assess immediate and delayed effects.

This study differs from prior research because it focuses on the mitigating effect of group interaction using GSS on individuals' self-interest in a resource allocation setting. We argue that individuals are faced with a conflict of interest or an ethical dilemma when they see a possibility to realise personal gain from their participation in a resource allocation process but their self-interest runs against the interests of the organisation as a whole. We specifically address an important question related to the mitigating effect: will the individuals' decisions be different in situations before and after group interaction (i.e. GSS)?

Our research also focuses on the effect of style of leadership on the individuals' resource allocation decisions. Previous research suggests that style of leadership influence individuals' perception regarding person-organisation value congruence. This perception alters their self-interest behaviour.

We conjecture that the style of leadership is of importance in determining how much and to what resources will be allocated. Therefore, related to the GSS research question above, we address the literature gap using the second question: will the effects of GSS be different depending on the style of leadership?

This study contributes to behavioural management accounting literature in two ways. First, it considers the impact of GSS in directing personal perception on resource allocation decisions. The findings allow the conclusion that both self-interest and social preferences are guiding motivational factors of individual behaviour. Such explanation, for answering why people must pursue organisational goal at the expense of their personal benefit, are relevant to the broader topics of self-control and organisational commitment, and has implications for settings such as workplace. Secondly, this study sheds light on how leadership style alters employees' behaviour when they face an organisational dilemma.

We test our hypotheses by conducting a controlled laboratory experiment in which 54 undergraduate business students each acts as a member of production department management. All subjects are to make decisions regarding resource allocation. We posit that when subjects have the opportunity to participate in a resource allocation process, they have incentives to alter the decision to acquire a greater share of resources. First, we assign participants to one of two types of leadership conditions (transformational and transactional) and have them make resource allocation decisions in the absence of group interaction. Second, participants are to make the same decisions in the presence of GSS.

Thus, our experiment employs 2 X 2 mixed factorial design, with style of leadership as between-subjects factor and the existence of GSS as a within-subjects factor. Participants complete the entire experiment via computer.

## Background Hypotheses and Research Framework

### Setting

Assume there is an individual who works in a production department. Her duty is to allocate money to three elements of product: material, labour, and overhead. The individual knows that she can benefit more by keeping the labour cost at the maximum amount. She also knows that reducing material cost will lead to product quality deterioration. The overhead cost remains fixed and cannot be altered. The extent to which the individual allocates less money to material cost and more money to labour cost represents a self-interest decision.

This raises a question regarding the method or scheme organisations should employ to motivate individual employees to allocate resources a manner to provide as great as possible benefit for those organisations. In this study, we examine the efficacy of GSS and style of leadership to alter the allocation decision. We select the variables described below, because of their theoretical importance and their common use in practice and research (see, e.g., Lynch et al., 2009; Kelly, 2010; Lam, 2011; Fudge and Schlacter, 1999). For example, Lynch et al. (2009) examine the effectiveness of computer mediated brainstorming in the context of the SAS No. 99 mandated fraud brainstorming requirement. Their results indicate that brainstorming effectiveness is significantly higher for teams brainstorming electronically relative to teams using traditional face-to-face brainstorming.

Kelly's (2010) results indicate that in a group decision-making context, differences in decision quality may be better explained by psychological factors rather than economic factors. Specifically, the study finds that group membership saliency affects the extent to which group members engage in information exchange, which ultimately impacts the decision quality. Lam (2011) documents the effect of longer evaluation window on the effectiveness of encouraging employees to focus on long-term rather than short-term profitability. Fudge and Schlacter (1999) offers a model based on expectancy theory to eliminate unethical practices of employees which may hurt the long-term interests of the company.

### Altering Effect of GSS

Group is arbitrarily defined as an assembly of individuals greater than two and typically no more than four (Birnberg, 2011). Jessup, Connolly and Tansik (1990) state that individuals in groups act as if they submerged in their groups. The individuals can engage in behaviour that they would not ordinarily display. Ho (1999) argues that group discussion may provide incentives for members to exert significantly more cognitive effort that will lead to a more thorough and deeper exploration of the related issues.

Conclusions from a number of research studies show that people in groups change their behaviour and judgment not in convergence to the middle of the initial solitary decisions. Rather, the group influence generally promotes a decision that is polarized toward one end of the distribution of initial group member decisions (e.g., Reyniers and Bhalla, 2013; Carpenter, Reimers, and Fretwell, 2011; El-Shinnawy, 1998).

Schultz and Reckers (1981) state that there are different theories that can provide a basis for the decision-shift phenomenon. First, diffusion of responsibility theory contends that the direction of a decision is determined by dominant preferences within a group or society. This is because individuals tend to shift part of the responsibility attributable to a decision to others, who dominate the group, when passing from the individual decision mode to the group decision mode. The second is social comparison theory, which argues that when individuals move to a group setting, they undergo a social/emotional experience which shifts their behaviour as the individuals try to re-establish themselves on the socially desirable side of behaviour. The literature also suggests that people change their behaviour within groups because of social influence pressure. DeZoort and Lord (1997) classify this pressure into three types: (1) obedience pressure, resulting when individuals with authority command other individuals' behaviour, (2) conformity pressure, the pressure to adhere to peer behaviour or expectations, and (3) compliance pressure, the pressure to acquiesce to explicit requests, regardless individuals' level of responsibility within the organisation. King (2002) finds, in an audit setting, that the self-serving bias of auditors is neutralised when they are exposed

to social pressure to conform to group norms. Social incentives involve the potential psychological costs to an individual of not behaving in line with a social norm. These costs are incurred when a group member actually needs to justify his or her deviation from the social norm in front of his/her fellow group members.

GSS has the capability to alter group decision making process. Ho (1999) asserts that GSS enables individuals to consider factors they might have overlooked at the individual level. This may result in a higher level of consensus of a decision making process. Ackermann and Eden (2011) state that GSS not only provides people with the facility to be anonymous, but also enables a high degree of equivocality necessary for facilitating negotiation by: (a) enabling views to be changed without penalty, (b) providing time to assimilate differences, and (c) supporting a greater understanding of the material to avoid misunderstanding and conflict. In addition, GSS allows the fullest contribution of all group members in influencing the discussion and thinking of the group.

Research demonstrates that the use of GSS has an impact in the process of providing social influence and pressure (Lynch et al. 2009). Jongsawat and Premchaiswadi (2011) show that web-based GSS improves the ways to represent group awareness information. They find that in a controlled experiment using GSS, group awareness information had a positive influence on group members' willingness to do more work or to have a commitment with the others to solve a given group task. Kerr and Murthy (1994) find that individuals working in GSS-supported groups exhibit greater learning than do face-to-face groups. Arnold et al. (2000) find that decision making using a GSS is better than individual decision making.

Murthy and Kerr (2003) argue that the superior performance of a GSS based decision has been largely attributed to parallel communication. Murthy and Kerr (2003) and Kerr and Murthy (2004) investigate the effects of different types of computer-mediated communication (CMC, a kind of GSS) in different task settings on the quality of the group's decision. The findings indicate that face-to-face groups outperformed CMC groups when problem solving was the measure of performance. Ackermann and Eden (2011), in

a negotiation setting, find that GSS is capable of protecting negotiation participants to develop agreements about action. In addition, GSS facilitates the retention of a negotiated social order and so allows more chance for sharing of cognition about substantive issues.

Our study examines the extent to which individuals make egocentric decision and how GSS mitigates the individuals' inclination to act selfishly. Diffusion of responsibility theory, social comparison theory (Schultz and Reckers, 1981) and social influence pressure (DeZoort and Lord, 1997) suggest that the presence of GSS can prevent individuals from developing feelings of animosity toward the organisation and makes them more likely to accept and support the organisation and its decisions. Specifically, GSS stimulates agreement in the organisation. Applied to the current study, these sense-making perspectives demonstrate that GSS will also attenuate the individuals' myopic behavioural tendencies.

According to the theories discussed above, people tend to focus on social signals to reduce uncertainties and GSS is one of the most important cues. We thus anticipate that, with the existence of GSS, individuals are willing to postpone their short-term, individual benefit in exchange for an enhanced long-term relationship with the group or the organisation.

Acting as a management team member in a resource allocation process, the individuals are expected to undergo an ethical dilemma when a cost reduction program is enacted. The study expects a mitigating effect of GSS on the individuals' self-interest behaviour once the individuals realise that the resource allocation process produces pressure. The following hypothesis is thus proposed.

*H1: Subjects under GSS conditions will allocate more money to material cost.*

### **Style of Leadership**

Yukl (1989) states that leadership has been defined in terms of individual traits, leader behaviour, interaction patterns, role relationships, follower perception, influence over followers, influence on task goals, and influence on organisational culture. House (1977) in Keller (1992) proposes a theory of charismatic leadership that focuses on how a leader can create an impression among

subordinates that the leader has the competence and vision to achieve success. Bass (1985) extends charismatic leadership to a theory of transformational leadership and transactional leadership. Yukl (2012) states that transactional leadership includes one task-oriented behaviour (monitoring), one relations-oriented behaviour (recognizing), and the communication of reward contingencies, which are usually specified by the formal compensation program. Transformational leadership, on the other hand, goes beyond traditional (transactional) leadership in elevating leaders and helping followers achieve higher levels of organisational functioning.

Bass and Avolio (1994) assert that transformational leaders influence their followers by broadening and elevating the followers' goals and providing them with the confidence to go beyond minimally acceptable expectations specified in an exchange activity.

Further, they state that transformational leaders exhibit four behaviours: (a) individualised considerations: understanding and appreciating different needs and viewpoints within a group, (b) intellectual stimulation: questioning of assumptions, reframing of problems, and thinking about concepts using novel paradigms, (c) inspirational motivation: energizing group members' desire to work cooperatively to contribute toward the collective mission, and (d) idealized influence: broader considerations of perspectives, moral issues and implications of one's actions.

Leadership theory suggests that transformational leaders communicate information to subordinates regarding their (the subordinates') organisational role and that the leaders provide subordinates with reward and recognition contingent upon the subordinates' achievement (Viator, 2001). Transformational leader behaviour is more likely to occur in functional areas that are dynamic in nature and undergoing substantive change (Yukl, 1989; Hater and Bass, 1988; Burke and Church, 1992). In a management accounting context, research shows that leadership style is an important factor (Brownell, 1983; Alder and Reid, 2008).

We conjecture that in a transactional leadership situation, people will tend to cater

their own interest since this type of leadership accommodates individuals' economic and self-interest needs. In a transformational leadership condition, leaders ignite the social awareness of individuals so that the subordinates will be emotionally attached to the organisation and thus their self-interest will be mitigated. Given this argument and previous research support, we propose a hypothesis as follows.

*H2: Subjects under a transformational leadership condition will care about material quality more than do subjects under a transactional leadership condition.*

### **The Interaction Effect of GSS and Style of Leadership**

Diffusion of responsibility theory along with social comparison theory and social influence pressure suggest that when individuals move to a group setting, they shift their behaviour as they try to re-establish themselves on the socially desirable side of behaviour. People are attentive to social relationship and expect for valuable outcomes from the relationship. The group membership will neutralize the self-serving bias of individuals when they are exposed to social pressure to conform to group norms. Individuals will perceive that social incentives are involved and that they will bear potential psychological costs if they do not behave in line with the social norm. In organisational settings, this perception leads to a variety of pro-social consequences, such as higher commitment to organisations and institutions and more extra-role citizenship. In summary, we expect that the existence of GSS will lead to individuals' lower inclination to self-interest decisions.

The extant motivation literature reveals that the pursuit of personally constructed goals involves maintenance of positive self-regard, whereas striving for socially constructed goals involves identification with role obligations at work (e.g., Chen et al., 2009). Personal goals may not have high social value and are not necessarily subject to consistent expectations from others. On the contrary, social goals are generally accorded with expectations from others and have high social value. Hence, we infer that transformational leadership may internalise social preferences to individuals and direct their behaviour in favour of social concerns.

Sosik, Avolio and Kahai (2012) find that GSS anonymity amplifies the positive effect of transformational leadership on group potency and group effectiveness relative to transactional leadership. Purvanova and Bono (2009) examine transformational leadership in the context of traditional teams using face-to-face communication and virtual teams using computer-mediated communication. Their results suggest that transformational leadership has a stronger effect in teams that use only computer-mediated communication, and that leaders who increase their transformational leadership behaviours in such teams achieve higher levels of team performance.

Taken together, the theories discussed above imply that individuals who perceive the existence of GSS and are exposed to a transformational leadership atmosphere will be more likely to behave in a less self-interest manner. The related hypothesis is thus proposed as follows.

*H3: The existence of GSS and transformational leadership will lead to more money allocated to material cost.*

The discussion above leads to the development of the Research Method in which a web-based laboratory experiment with students was conducted (see Appendix One for an in-depth discussion of the research method).

## Results

### Analysis

Descriptive statistic presents the demographic characteristics of participants (gender, age). Randomization effectiveness testing in eliminating individual characteristic differences between groups will be done by one-way ANOVA. We use ANCOVA to test proficiency in cost and management accounting, where the dependent variable is the allocation for cost of material and the independent variable is type of leadership and the covariate variable is score test proficiency in cost and management accounting. Two-Way ANOVA is used to test all of the hypotheses.

The one-way ANOVA test shows an effective randomisation in that there is no significant effect of demographic variables (gender, age,

or GPA) on participants' decision. The ANOVA test with cost accounting knowledge score as covariate, material cost as dependent variable, and leadership style as independent variable also shows no significant effect of cost accounting knowledge score on production costs-related decisions.

### Test of Hypothesis 1

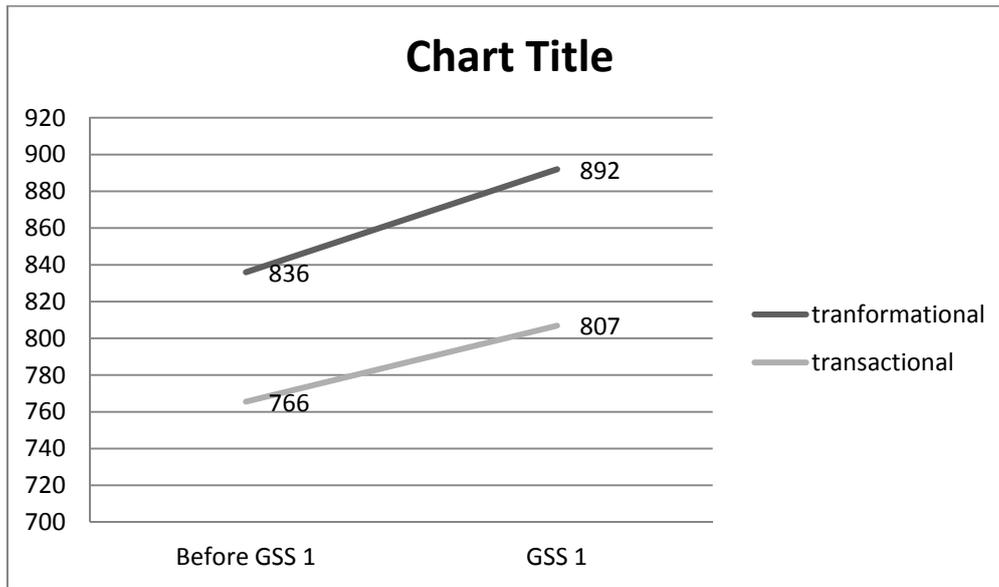
Hypothesis 1 states that subjects under GSS condition prioritize material cost than direct labour cost. Our result shows that the participants under transformational (transactional) superiors have the mean of material cost of 836 (766) while the mean of material cost after discussion is 892 (807) (see Table 1 and Figure 1). The result indicates that discussion in group can alter participants' decision on the importance of material quality in determining production costs.

**Table 1: Mean (Standard Deviation) of Material Cost before and after GSS with Production Managers**

	<b>Before GSS 1</b>	<b>After GSS 1 (with Fellow Manager)</b>
<b>Transformational (N=25)</b>	836 (165.53)	892 (115.18)
<b>Transactional (N=29)</b>	766 (151.84)	807 (143.75)

Table 2 presents some opinions of participants who have transformational superiors and discuss the importance of material in production decisions. For example, participants with ID number 81 allocates 900 points to material cost and increases the material cost to 1000 after discussion with her fellow production managers. Consequently, her direct labour cost decreases from 600 to 500 after the discussion. This indicates the shift of her rationality. Similarly, participant number 105 allocates 1,000 points to material cost and 500 points to direct labour cost. After the discussion, she maintains her material cost at the level of 1,000 (the highest possible amount) but reduces the direct labour cost to 500.

**Figure 1: Graphic of Difference of Material Cost before and after GSS With Production Managers**



**Table 2: Excerpts of Participants’ Opinion under Transformational Superiors before and after Discussion**

User	Opinion before Discussion	Opinion after Discussion
<i>Number 81 (female, 20 years)</i>	In any case, the material quality must be high to have high quality output, although I have to reduce my direct labour cost (Material cost: 900, direct labour cost: 600 )	I have to have material with the best quality (Material cost:1,000, direct labour cost: 500)
<i>Number 105 (female, 19 years)</i>	It is indeed important to have high quality material, but we also need to reduce direct labour cost (Material cost: 1,000, direct labour cost: 900)	It is very important to maintain material quality. (Material cost:1,000, direct labour cost: 500)

**Table 3: Mean (Standard Deviation) of Direct Labour Cost before and after GSS**

	Before GSS 1	After GSS 1 (with fellow manager)
<b>Transformational (N=25)</b>	664 (165.53)	596 (120.69)
<b>Transactional (N=29)</b>	734 (151.84)	672 (150.94)
<b>Total (N=54)</b>	701 (160.77)	637 (141.82)

Our paired t-test to compare pre- and post-GSS discussion of material cost shows significant difference show at table 3 (t value = -2.693, p = 0.009). Therefore, we conclude that the in group discussion alters participants' rationality from high self-interest motive (incentive oriented) to product-quality orientation (group or social motive).

**Additional Test of Hypothesis 1**

We conduct an additional test to show that under GSS treatment, participants' tendency to decrease direct labour cost (see Figure 2).

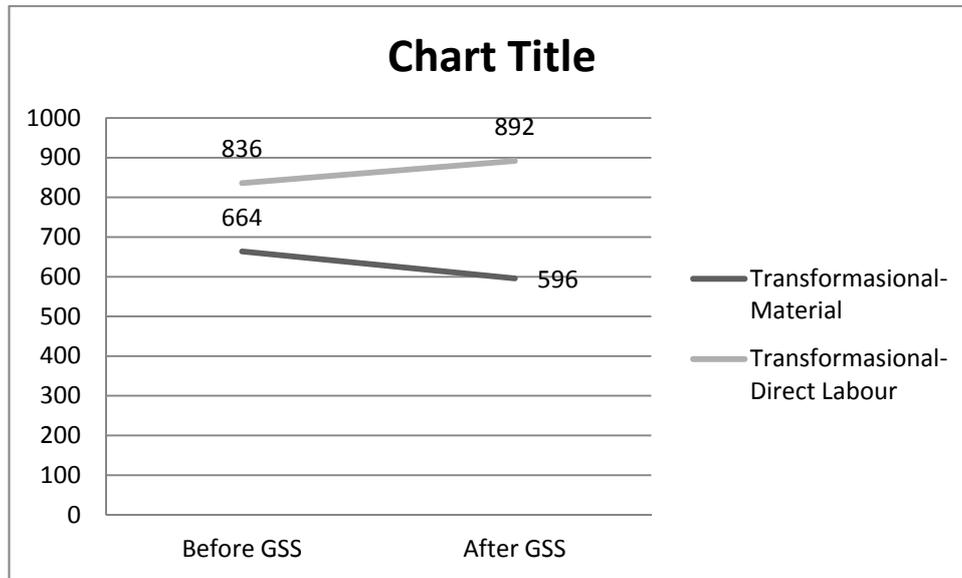
**Test of Hypothesis 2**

Hypothesis 2 posits that participants under transformational leadership will care about material quality more than do they under the transactional leadership condition. Table 3 and Figure 3 display descriptive comparison of

pre-discussion material cost of participants under transactional and transformational leaders. After the discussion, participants under transformational superiors do not change their decisions on the amount of material cost. In contrast, participants under transactional leaders significantly reduces the amount of material cost from 807 to 706 (Table 4). Transactional leaders emphasise the importance of direct labour cost because it affects the amount of incentive they will receive. Consequently, as employees they tend to reduce the amount of material cost and material quality to satisfy their own self-interests.

Table 5 shows the result of ANOVA test that indicates that leadership style significantly affects the decision to determine material cost (F=4.026, p=0.047). Therefore, the finding supports hypothesis 2.

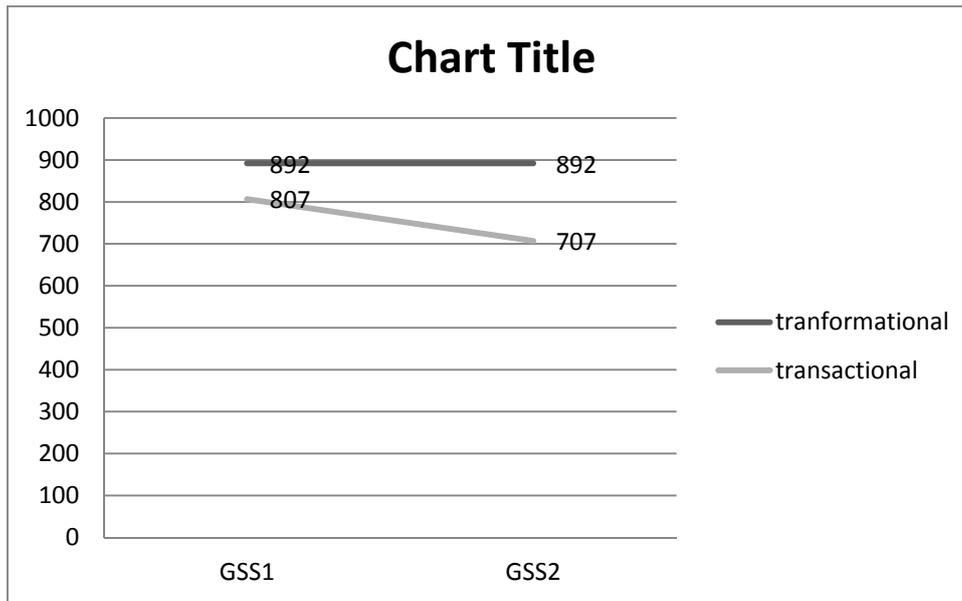
**Figure 2: Graphic of Difference of Direct Labour Cost before and after GSS**



**Table 4: Mean (Standard Deviation) Material Cost before and after GSS Discussion with Superiors**

	Before GSS 2 (After GSS 1)	After GSS 2 (discussion with superiors)
<i>Transformational (N=25)</i>	892 (115.18)	892 (118.74)
<i>Transactional (N=29)</i>	807 (143.75)	706 (133.44)

**Figure 3: Difference of Material Cost before and after GSS with Superiors**



**Table 5: Result of ANOVA Test**

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	635125.287 <sup>a</sup>	3	211708.429	12.697	0.000
Intercept	7.301E7	1	7.301E7	4.379E3	0.000
Leader	490125.287	1	490125.287	29.396	0.000
GSS	67129.630	1	67129.630	4.026	0.047
Leader * GSS	67129.630	1	67129.630	4.026	0.047
Error	1734041.379	104	16673.475		

**Additional Test of Hypothesis 2**

As a robustness test, we investigate the participants’ decision on direct labour cost with independent t-tests. Empirical result demonstrates significantly different decisions between participants with transactional-type leaders and participants with transformational-type leaders (t=3.690, P=0.001). This result is an evidence that participants under transformational-type leaders reduce their self-interests. Consequently, they prioritise material cost over direct labour cost. Whereas participants under transactional-type leaders increase their self-interests and prefer direct labour cost that has direct effect on their income to material cost.

**Test of Hypothesis 3**

Hypothesis 3 states that GSS and transformational leaders encourage participants to emphasise material cost. Table

6 above shows the result of ANOVA test indicating the interaction between leadership type and GSS (F=4.026, p=0.047). The result shows that individuals who discuss with and are under transformational leaders reduce their self-interests while those with transactional leaders increase their self-interests.

The result is supported by opinions of some participants that can be seen at Table 6. Participant number ID 37 mentions that balanced material cost and direct labour cost will contribute to high-quality products. He decides to determine material cost of 800 and direct labour cost 700. After discussing with his transformational superiors, his material cost increases to 1,000 (the highest possible amount) and direct labour cost decreases to 500. Another participant (ID 13), argues that material cost is sufficient to improve product quality. After discussing with her transformational superior, the amount of

material cost is 1,000 and direct labour cost declines to 500.

Participants with transactional-type superiors reduce their material cost and increase the direct labour cost after discussion. For example, participant number ID 75 contends that the firm must sustain the labour motivation and incentive without sacrificing the material quality to maintain product quality. He assigns 700 points for material cost and 800 for direct labour cost before discussion. After the discussion, the amount of material cost is 500 and direct labour cost

1,000. Another opinion from participant 103 indicates that the firm emphasises material quality so that she determines the material cost of 1,000 and direct labour cost 500. After discussing with transactional superior, the material cost decreases to 800 and direct labour cost 700. From the results and participants' opinion, we can conclude that self-interested individuals will be more selfish when they are under transactional leaders. On the other side, transformational leaders reduce individual selfishness and prioritise organisational goals over their individual needs.

**Table 6: Excerpts of Opinion of Participants before and after Discussion**

No User	Opinion before Discussion	Opinion after Discussion
<b>PANEL A. Transformational Leaders</b>		
<i>No 37 (male, 19 years)</i>	Balancing material cost and direct labour cost enables the firm to maintain good quality and optimal labour incentive. Consequently, the product quality is assured and the firm can compete against other firms. (Material cost: 800, direct labour cost: 700)	We need to emphasise product quality because that is what the Mr. Michaels wants. (Material cost: 1,000, direct labour cost: 500)
<i>No 13 (female, 19 years)</i>	Material cost is very significant in influencing product quality. Therefore it is necessary to carefully select good material in order to maintain good product quality. (Material cost: 800, direct labour cost: 700)	Good product quality only comes from the best material quality. (Material cost: 1,000, direct labour: 500)
<b>PANEL B. Transactional Leaders</b>		
<i>No 75 (male, 20 years)</i>	While maintaining material quality, labour incentive is very important in making high-quality product (Material cost 700, direct labour cost 800)	Mr Kertajasa requires me to increase direct labour cost to increase labour incentive (Material 500, TKL 1000)
<i>No 103 (female, 21 years)</i>	The firm takes product quality very seriously (Material 1000, direct labour cost 500)	My superior pushes me, although he still mentions that material quality is also important (Material 800, direct labour cost 700)

## Discussion and Conclusion

This study investigates the role of GSS-based group interaction and leadership style in mitigating individual self-interests. Motivated by the fact that GSS has been the backbone of business decision making process in many organisations, we propose that individual decisions before and after GSS are different. This research also focuses on how leadership style affects individual decisions. Individuals tend to prioritise their individual needs over their organisations' goals. Transformational leaders encourage individuals to emphasise organisational goals and de-emphasise their self-interests. Transactional leaders, on the other hand, tend to focus more on rewards; encouraging individuals to pursue their individual needs at the expense of organisational needs.

Our findings support previous research that demonstrates that GSS and leadership style affect resource allocation decisions. First, GSS drives individuals to prioritise the amount of material cost over direct labour cost. After the discussion, participants put more emphasis on material quality. This supports existing theory that argues that social pressure delivered by DSS drives individuals to be more pro-social and reduce their individual self-interests. Secondly, transformational leadership encourages individuals to emphasise material quality. This finding shows that charismatic leadership style enables individuals to act positively towards the organisation and prioritise organisations' goals over their individual needs. However, transactional leaders drive individuals to behave more selfishly because they emphasise incentive or reward for their individual needs at the expense of organisational goals.

Third, this research also supports the literature that suggests the existence of an interaction between GSS and leadership style. Individuals who make discussion with transformational superiors tend to make resource decision that support organisational goals. On the other hand, within the organisational environment created by transactional leaders, discussion between subordinates and superiors will increase subordinates' individual self-interest.

Overall, we conclude that GSS is an effective method to increase decision quality. The

empirical findings support Lynch et al. (2009) and Jongsawat and Premchaiswadi (2011) who find that information within group that created by GSS-based discussion increases quality of individuals' decision. The findings also support responsibility theory, social comparison theory (Schultz and Reckers, 1981) and social influence pressure theory (DeZoort and Lord, 1997) that argue that GSS potentially encourages individuals to prioritise organizational goals over their own individual interests. The results are also in line with Yukl (1989) who suggests that leadership can influence their members' interaction and organisational culture. The results also support charismatic leadership theory of House (1977) (in Keller (1992) who contends that charismatic leaders focus on creating positive impression to their subordinates in order to achieve organisational goals successfully.

We also agree with Sosik, Avolio and Kahai (2012) who find that GSS increases the positive effect of transformational leaders (relative to transactional leaders) on group effectiveness. Purvanova and Bono (2009) also demonstrate that transformational leaders who communicate with their subordinates through computer have strong effects on decision making process.

This research focuses on computer-based individual decision making processes. Future research can improve this study by developing online group discussions in decision making. Future research can also include organisational culture and individual personality type when investigating the effect of leadership style and group discussion on individual decision making.

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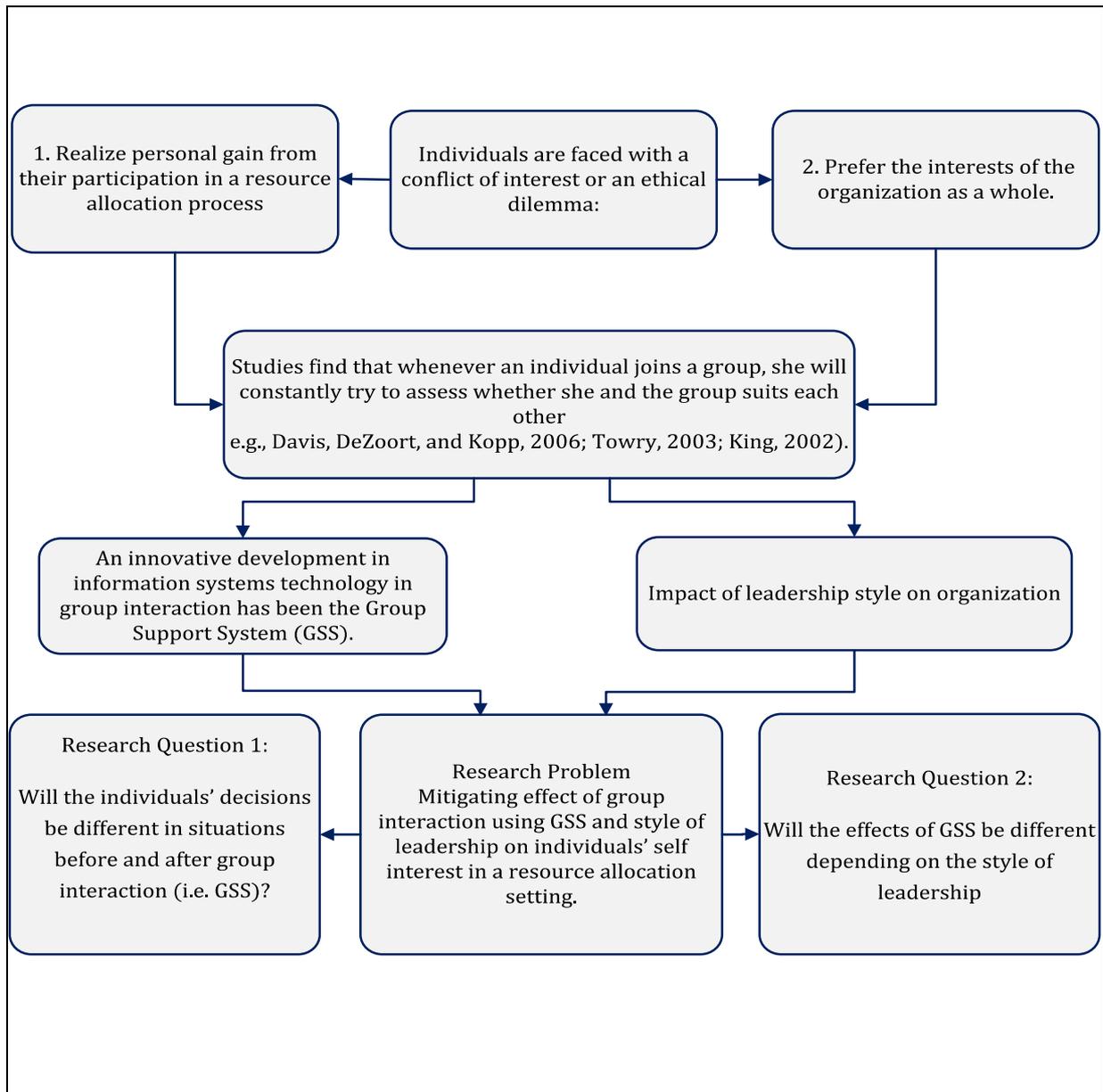
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## Appendix One: Research Method

**Figure 1: Research Framework**



We employ a laboratory experiment to empirically investigate individual decision process in resource allocation. Due to real-world complexity, an empirical test with field data bears the major problem that it is difficult to control for all possible causal influences.

### Participants and Design

We solicit participation of fifty four undergraduate business students as our experiment subjects. The subjects are randomly assigned to two of four treatment

conditions. We obtain the four conditions by crossing two GSS conditions with two styles

of leadership. First, we assign participants to one of two group style of leadership (transformational and transactional) in the absence of GSS. Second, all participants are assigned to conditions in which GSS is present. Finally, participants in all four conditions complete an experimental task and the entire experiment is conducted via computer. Figure 2 shows the design cells.

**Figure 2: Experimental Design**

		GSS Conditions	
		<i>Absence</i>	<i>Presence</i>
Style of Leadership	<i>Transformational</i>	Cell 1	Cell 2
	<i>Transactional</i>	Cell 3	Cell 4

### Experimental Procedure

The procedure comprises of eight steps as follows.

- Participants are seated randomly to computers equipped with pre-installed experimental software. After logging in and filling up some demographic data, participants are exposed to profile of a large manufacturing company. The computer screen also shows interactive information regarding the company. We design the software as attractive as possible to assist the subjects in internalizing their role and task.
- The next screen informs the subjects regarding their role and task. Each subject acts as a manager in the production department and their task is to allocate costs in the department.
- The next computer screen provides information about the experimental task. Participants receive compensation based on their cost allocation decision. Compensation is distributed in the form of "dollar" and is translated automatically into raffle tickets. The tickets are drawn at the end of the experiment to produce four winners who get awarded each Rp500,000 (approximately AUD \$50).
- In the next step, we test the subject proficiency in cost and management accounting. The subject proficiency is used as a covariate at the later analyses. At the first stage, participants are informed that they are to determine a standard cost for a particular product.
- The participants are to discuss their task with production director and vice director (our confederates act as the directors in this experiment). We inform the participants that they have leaders with transformational or transactional type of leadership characteristics. Further, in each of the conditions participants have a discussion with the two leaders via electronic chatting with different style of
- leadership. Leaders in transformational condition encourage participants to mind product quality and the interest of the company. Leaders in the transactional condition assert that participants lean toward short-term orientation.
- At the end of discussion session, participants are instructed to allocate up to a maximum of \$2,000 to three cost components: material, labour, and overhead. There are three choices of material and its costs: high quality material with the highest cost (\$900-1,000), moderate quality material with modest cost (\$700-899), and low quality material with the lowest cost (\$300-699). The maximum amount of labour cost is set at \$1,000. The assumption of the design of the experiment is that raw material *alone* can improve the quality of the product<sup>1</sup>.
- Participants receive the entire labour cost as their payment at the end of the experiment. The overhead cost is set fixed at the amount of \$500. Participants are unable to change the overhead cost. The computer program will automatically account for production cost and raffle tickets to distribute to participants.
- At the end of the experiment, participants get a debriefing session in which they answer manipulation check questions and receive payments.

<sup>1</sup> In this experiment, the quality of the final product is unrelated to the time spent on labour. In an alternative situation, it is recognised that the labour force can spend a lot of time (and therefore money) making sure that the product is assembled properly. In such situations, there is no point having the best of materials if the labour does a poor job of assembly, thus resulting in a poor quality product. In this experiment, however, the amount of labour is decided by participants and indicates their self-interest level. The increase or reduction in labour costs in this experiment is more akin to time expansion (taking more time to do the same quality job), and has no bearing on the quality of the product.

