Reducing Status Effects with Computer-Mediated Communication: Evidence from Two Distinct National Cultures

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ABSTRACT: Matching laboratory experiments were conducted in two distinct national cultures to investigate whether computer-mediated communication (CMC) can reduce status effects during group communication in both national cultures. Three independent variables were studied: national culture (Singapore versus U.S.), task type (intellective versus preference), and communication medium (unsupported versus CMC). Three different facets of status effects were measured as dependent variables: status influence, sustained influence, and perceived influence. Singapore groups reported higher sustained influence than U.S. groups. Preference task groups experienced higher status influence and sustained influence than intellective task groups. Unsupported groups also had higher status influence and sustained influence compared to CMC groups. In addition, Singapore groups that completed the preference task in the unsupported setting reported higher perceived influence than groups under other treatments. These results demonstrate that CMC appears to be able to reduce status effects during group communication, both in Singapore and in the United States. This is especially true when groups are working on a preference task. Moreover, status influence appears to be more sustainable in Singapore groups, where group members appear to be more conscious of its presence, than in U.S. groups.

KEY WORDS AND PHRASES: communication medium, computer-mediated communication, national culture, status effects, task type.

If our [U.S. cultural] values were otherwise, social conformity could be viewed as pro-solidarity behavior; attitude change as cognitive adaptation; and the risky shift as the courageous conversion. [24, p. 312]

MANY THEORIES AND PRACTICES IN MANAGEMENT AND SOCIAL PSYCHOLOGY are deeply rooted in North American culture and strongly reflect North American values [5]. This trend can also be observed in the field of information systems, for which management and social psychology are major underlying disciplines and where a substantial amount of accumulated knowledge is based on North American research and observations. While such "made-in-North America" theories have guided knowledge building over the past several decades, often with implicit universalism, scholars and practitioners are now beginning to be more concerned with the extent of applicability of such theories beyond North America [5, 61].

The growth of global businesses [60] is a major impetus driving scholars and practitioners to question the universal applicability of existing theories and practices. Globalization gives North Americans opportunities to come into business contact with people from a myriad of national cultures. In many instances, attempts to introduce North American theories and practices into these cultures were not successful [10, 28]. People from dissimilar national cultures have different ways of doing business and disparate values for guiding human behavior. With a better appreciation of the cultural factor, scholars are emphasizing the need to assess the cultural robustness of existing theories and practices to distinguish universal from culture-specific knowledge [57].

This paper focuses on computer-mediated communication (CMC), a topic commonly studied under the rubric of group support systems [51]. Reviews of the group support systems literature [2, 13] show that scant attention has been paid to the cultural factor (exceptions are [43, 65]). Following the trend in information systems and group support systems research, current CMC knowledge is mainly a product of North American research. However, as CMC increasingly transcends national boundaries, national culture becomes a critical research issue. Given that national culture influences human behavior and moderates CMC impact on group communication [65], a fundamental research question is raised: *To what extent is CMC impact on group communication uniform across different national cultures?*

This study adds to the small body of knowledge on the cultural perspective[1] in the field of information systems [43, 58, 65]. It examines how CMC can alter the effects created by higher-status individuals in a group communication setting. Using matching laboratory experiments, it assesses the cross-cultural robustness of these results across two distinct national cultures. If cultural factors are indeed found to moderate CMC impact on group communication, these results may have several important implications for prior and future CMC (and information systems) research. First, current theories and practices on CMC (and information systems) may need to be evaluated for their cross-cultural applicability. Second, future studies on CMC (and information systems) may need to be qualified in terms of the cultural setting on which they are based. Third, future meta-analyses of CMC (and information systems) findings may need to consider cultural factors as possible explanatory variables.

Status Effects and Group Communication

ORGANIZATIONS RELY HEAVILY ON GROUPS AS DECISION MAKERS [21]. When decisions are made by groups, some aspects of the group decision process may enhance while other aspects of the group decision process may impair group decision outcomes. Aspects of group decision process that enhance and impair group decision outcomes are known, respectively, as process gains and process losses [47]. Group decision outcomes are contingent upon the balance of process gains and process losses [8, 47].

Status differences occur widely among members of organizational groups, which usually consist of a minority of higher-status and a majority of lower-status individuals [3]. When groups communicate to arrive at decisions, higher-status individuals tend to control the communication and exercise more influence [37, 59], thereby creating status effects. In some situations, excessive status effects can bring about process losses such as domination [30], cognitive inertia [30], and conformance pressure [26]. Domination arises when higher-status individuals unproductively monopolize group communication time. Cognitive inertia occurs when lower-status individuals permit the discussion to follow the train of thought of higher-status individuals. Conformance pressure results when lower-status individuals refrain from criticizing the views of higher-status individuals out of fear of reprisals. These process losses can be alleviated by reducing status effects during group communication.

Three variables that reflect different facets of status effects are status influence, sustained influence, and perceived influence. *Status influence* is the extent to which lower-status individuals defer to opinions of higher-status individuals during group communication. It shows the degree to which higher-status individuals are able to influence lower-status individuals. *Sustained influence* is the amount of status influence remaining after group communication when higher-status individuals are no longer present. It shows the extent to which the influence of higher-status individuals is able to persist over time. *Perceived influence* is the amount of status influence lower-status individuals are aware of during group communication. It shows their level of awareness of influence attempts by higher-status individuals. Factors that can alter status influence, sustained influence, and perceived influence are national culture [28], task type [41], and communication medium [51].

National Culture

Culture has been defined as the collective programming of the mind that distinguishes members of different societies [28]. Cultural patterns in societies are distinct and maintainable over generations [49]. Cultural differences between members of different nations and societies are stable over the long term. Hofstede [28] offers a model of national culture with five dimensions: power distance, individualism–collectivism, masculinity–femininity, uncertainty avoidance, and time orientation. These dimensions were distilled from surveys involving more than 120,000 respondents from more than 50 countries. Other studies have lent support to the stability of these dimensions [53, 56]. Scholars in social psychology and management have successfully used these dimensions to account for empirical observations [18, 19, 34, 62]. In the field of information systems, Straub [58] has used the uncertainty avoidance dimension to explain why the diffusion of information technologies differed in the United States and Japan. Watson et al. [65] have used the individualism–collectivism dimension to account for differences in the way group support systems affected group decisions in the United States and Singapore. Hofstede's [28] model has been shown to be useful with explanatory powers in several disciplines. Thus, it is adopted as a theoretical framework for this study.

Two dimensions of national culture are relevant to this study: power distance and individualism–collectivism. *Power distance* is the extent to which lower-status individuals of organizations in a country accept that power is distributed unequally [28]. In high-power-distance countries, status differences among individuals are pronounced and people accept unequal rights. Higher-status individuals are powerful [28] and exert excessive influence during group communication. Status influence is likely to be high. In low-power-distance countries, status differences among individuals are less significant and people believe in equal rights. When groups communicate, they are likely to adopt an egalitarian approach [28], where higher-status individuals do not exercise excessive influence. Status influence is likely to be low.

Individualism and *collectivism* are two extremes of a bipolar continuum [28, 62]. In

individualistic countries, people tend to be candid and task concerns tend to prevail over relationship concerns [19]. During group communication, lower-status individuals are likely to express their views frankly and openly, and resist influence attempts by higher-status individuals. Status influence is likely to be low. In collectivistic countries, people strive to maintain harmony and relationship concerns tend to prevail over task concerns [19]. During group communication, lower-status individuals are likely to yield to influence attempts by higher-status individuals in order to avoid confrontation. Status influence is likely to be high. Given that Singapore is a high-power-distance and collectivistic country while the United States is a low-power-distance and individualistic country [28], we propose our first hypothesis:

Hypothesis 1a: Status influence will be higher in Singapore groups than in U.S. groups.

Status influence in organizational groups is usually exercised by a minority of higher-status individuals. Research has shown that influence from a minority tends to manifest itself at the private level because people who accept the minority position tend to do so privately [40]. Hence, the impact created by this influence may often be stronger than that observed publicly. Moreover, this impact tends to be lasting [45]. If status influence is exercised by a minority (as in this study), it is likely to possess similar characteristics. Thus, it is predicted that status influence would be lasting and sustainable. Conditions that permit high status influence are likely to result in high sustained influence. Since status influence is likely to be higher in Singapore groups than in U.S. groups, we propose the next hypothesis:

Hypothesis 1b: Sustained influence will be higher in Singapore groups than in U.S. groups.

Influence exerted by a minority tends to attract attention [32]. It also needs more time to take effect, thereby stimulating considerable cognitive effort among the people affected [44]. The greater amount of attentional and cognitive effort elicited is likely to make people more sensitive to the presence of such influence attempts. If status influence is exercised by a minority (as in this study), group members are likely to have a strong perception of its occurrence. Hence, conditions that permit high status influence are likely to produce high perceived influence. Since status influence is likely to be higher in Singapore groups than in U.S. groups, we predict:

Hypothesis 1c: Perceived influence will be higher in Singapore groups than in U.S. groups.

Task Type

During group communication, task type affects the balance of process gains and process losses [47]. Task type also influences the appropriation of technologies by groups [16]. McGrath [41] offers a model of task types. This model is superior to others because its task types are mutually exclusive and collectively exhaustive, and it reveals

subtle relations among task types [41]. This model has been used by researchers to organize [6, 13] and to perform meta-analysis [2] on empirical findings. Since McGrath's [41] model has been successfully used to account for empirical observations, it is considered a theoretical framework appropriate for this study.

This study examines two of McGrath's [41] task types: intellective task and preference task. Both task types are widely encountered in organizations and commonly carried out by groups [11]. *Intellective tasks* have objective answers that can be established on factual information and rational reasoning. When solving these tasks, group members typically exchange factual information as evidence of reality. Moreover, they tend to use the same system of rational reasoning to arrive at the answers [33]. This system of rational reasoning is typically anchored on generally agreed-upon decision guidelines. *Preference tasks* do not have objective answers. Instead, their answers are subjective and are often established on normative information and personal preferences. When carrying out these tasks, group members usually exchange normative information as a gauge of mutual preferences. These indications of personal preferences are used to derive the group norms upon which the answers are based [33]. This lack of a system of rationale reasoning is due to a lack of generally agreed-upon decision guidelines.

Status influence is normally applied by exchanging normative information (e.g., personal preferences of higher-status individuals) rather than factual information [7]. Hence, when groups exchange factual information to solve intellective tasks, higher-status individuals may have greater difficulty in exercising status influence. But when groups exchange normative information to solve preference tasks, higher-status individuals may have ample opportunities to exercise status influence. Therefore, it is predicted that status influence will be higher in preference task groups than in intellective task groups. As discussed above, circumstances leading to high status influence are also likely to result in high sustained influence and high perceived influence. Thus, it is predicted that the results for sustained influence and perceived influence will follow those for status influence.

> *Hypothesis 2a: Status influence will be higher in preference task groups than in intellective task groups.*
>
> *Hypothesis 2b: Sustained influence will be higher in preference task groups than in intellective task groups.*
>
> *Hypothesis 2c: Perceived influence will be higher in preference task groups than in intellective task groups.*

Communication Medium

Communication research has demonstrated the importance of communication medium as a factor influencing group communication and decision making [68]. Poole and Jackson [51] synthesize existing communication literature and suggest that communication medium is a critical theme for CMC research. This suggestion has been reinforced by findings from recent empirical studies [36, 52, 63]. Dubrovsky et al.

[17] observe that higher-status individuals tend to dominate more when groups communicate in a face-to-face setting than in a dispersed setting. Given the importance that has been accorded to CMC by recent studies, this study endeavors to continue and expand this particular area of research.

Verbal communication, such as the tone and loudness of voice, facilitates transmission of normative information [41]. Since status influence can be effectively applied by exchanging normative information [7], it can be effectively exercised using verbal communication [3]. When groups exchange information in an unsupported setting using verbal and textual communication, higher-status individuals may have plenty of opportunities to exercise status influence. But when groups exchange information in a CMC setting solely through textual communication, the ability of higher-status individuals to apply status influence may be hindered. Therefore, it is predicted that status influence will be higher in unsupported groups than in CMC groups. As illustrated above, situations that permit high status influence are also likely to result in high sustained influence and high perceived influence. Hence, it is predicted that the results for sustained influence and perceived influence will reflect those for status influence.

> *Hypothesis 3a: Status influence will be higher in unsupported groups than in CMC groups.*
>
> *Hypothesis 3b: Sustained influence will be higher in unsupported groups than in CMC groups.*
>
> *Hypothesis 3c: Perceived influence will be higher in unsupported groups than in CMC groups.*

Research Methodology

A 2×2×2 FACTORIAL DESIGN WAS OBTAINED BY CONDUCTING matching laboratory experiments in two distinct national cultures.[2] By crossing national culture (Singapore versus U.S.) with task type (intellective versus preference) with communication medium (unsupported versus CMC), this experimental design resulted in eight cells.

National Culture

Although Singapore and the United States differed on all dimensions of national culture, according to [28], their differences on the power distance and individualism–collectivism dimensions were most germane to this study. Other differences between Singapore and the United States could be pertinent, depending on the issue under investigation [65]. Hofstede [28] provides power distance and individualism–collectivism scores for more than fifty countries (see Table 1). For the power distance dimension, a higher score represents higher power distance. For the individualism–collectivism dimension, a higher score represents individualism while a lower score represents collectivism. In this study, national culture was operationalized by carrying out matching laboratory experiments in Singapore, a high-power-distance and collectivistic

country, and the United States, a low-power-distance and individualistic country. Singapore and the United States are both English-speaking countries with well-educated populations [65]. These similarities helped to control for factors that could be confounded with the manipulation on national culture. Both experiments varied task type and communication medium.

Task Type

Both the intellective task and preference task were mock jury tasks involving civil damage suits where the defendant had been pronounced guilty. These tasks have been used in prior social psychology [33] and CMC studies [7]. Both tasks presented groups with arguments and claims made by the plaintiff and the defendant. Groups assigned to the intellective task had to decide on an amount of compensatory damages to award the plaintiff. They were able to show some rational reasoning for and factual information behind their decisions because the task provided them with decision guidelines. With common decision guidelines, the range of possible solutions for this task was likely to be narrow. Groups assigned to the preference task had to decide on an amount of exemplary damages to award the plaintiff. They had to base their decisions on personal preferences because the task provided them with no decision guidelines. In the absence of common decision guidelines, a wide range of possible solutions existed for this task.

Communication Medium

Figure 1 illustrates the unsupported setting and the CMC setting. Communication network was controlled using a wheel topology. Group members could not communicate directly. Instead, all communication flowed between them and a common display (whiteboard for the unsupported setting and public screen for the CMC setting). Communication strategy was controlled using parallel decision generation and sequential decision presentation. Each round of group communication lasted fifteen minutes on average (five minutes for decision generation and ten minutes for decision presentation). In the unsupported setting, group members concurrently wrote their amounts and reasons on paper in each round of group communication. They then took turns presenting their amounts and reasons by reading aloud from their paper. The experimental administrator recorded their names and amounts on the whiteboard. Thus, in this setting, verbal and textual information was exchanged. In the CMC setting, group members concurrently entered their names, amounts, and reasons into their terminals in each round of group communication. The experimental administrator then displayed the names, amounts, and reasons of each person, one at a time. After this, all their names and amounts remained on the public screen. Thus, in this setting, only textual information was exchanged. Therefore, differences between the unsupported setting and the CMC setting could be attributed to verbal communication. CMC was carried out using the electronic communication capability of a group support system, a commonly used approach for implementing CMC [51]. No anonymity was

Table 1.   Power Distance and Individualism–Collectivism Scores [28]

Country	Power distance	Individual–collectivism
Singapore	74	20
United States	40	91
Lowest country score	11	6
Average country score	57	43
Highest country score	104	91

provided for both settings. Prior CMC research has demonstrated that strong effects could be obtained by manipulating communication medium alone without anonymity [7, 17, 42].

Subjects and Confederates

Five-person groups were formed for this study because this is a common size for small group research [27] and small group decision making in organizations [12]. Each group consisted of four subjects and a confederate. To reduce the likelihood of absenteeism, subjects and confederates were allowed to sign up for groups based on their availability. But in order to alleviate the selection bias of groups formed in this manner, the treatments for the groups were not made known to subjects and confederates. Instead, all groups were randomly assigned to treatments to control for individual differences, which might affect the results [25].

The subjects were information systems undergraduates from a large university in their respective countries. They were given course credit to encourage them to take their task seriously. The confederates were volunteers. They were information systems graduate students from the same university and department as the subjects. They were citizens or permanent residents of their respective countries and had stayed in their respective countries for at least three years prior to this study.[3] The confederates were blind to the research design and hypotheses so that they would not introduce biases into the results. Since the confederates were higher degree students from the same department as the subjects, the confederates were senior to the subjects in terms of organizational position. On average, the confederates were eight years older than the subjects. Since organizational position and age are determinants of status [3], the confederates had a higher status than the subjects. The confederates produced status effects by strictly adhering to a script that dictated their behavior during group communication.[4] Using a similar approach, prior studies on social psychology [37] and CMC [17] have successfully induced status effects in laboratory experiments by combining graduate students with undergraduates. Confederates have also been extensively used in previous social psychology (reviewed in [39]) and CMC research [7] in a similar manner to provide controls.
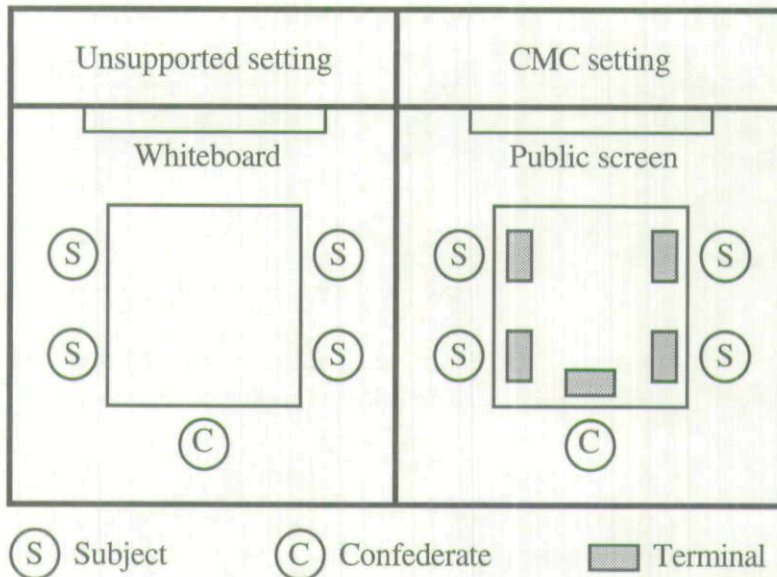
Figure 1. The Unsupported Setting and the CMC Setting

Experimental Procedure

The same experimental administrator participated in all sessions conducted at each country. To control for differences in administration abilities, both administrators conducted all their sessions using the same script. At the start of each session, the confederate was introduced to the subjects as a teaching assistant from the same department to highlight the status of the confederate. The group was then told that this study examined how people with different background might work together to resolve civil damage suits. They were also told that the amount of course credit awarded to them would depend on how seriously they took their task. They had twenty minutes to read a case corresponding to their respective task types. The case provided them with claims and arguments made by the plaintiff and the defendant.

Next, the group was briefed on the group communication process, which consisted of a series of rounds. In each round, every group member had to present his or her name, amount, and reason. The experimental administrator controlled the order of presentation so that the confederate was always the last to do so. In the unsupported setting, the confederate would be the last to present the amount and reason. In the CMC setting, the confederate amount and reason would be displayed last. This helped ensure that the confederate would not produce first advocacy effects [66], which could be confounded with status effects. It also prevented the subjects from adopting the confederate position in the first round so that their initial positions, free from status effects, could be assessed. The group communication process ended when all the subjects had moved to the confederate position or when the group had completed eight rounds. The confederate was then told to proceed to another room to "attend an interview and fill out a questionnaire." This permitted the subjects to restate their

decisions individually on paper and to respond to perceptual questions by filling a questionnaire, in the absence of the confederate.

Confederate's Procedure

The case given to the confederate contained a hidden script. Given the seating position of the confederate (see figure 1), the script was not visible to the subjects. In the first round of group communication, the confederate always awarded twice the highest amount given by any of the four subjects in order to create a substantial gap between initial confederate and subject positions. This was possible because, as the last person to present the amount, the confederate could see the amounts given by all the subjects. The simple formula for initial confederate amount helped the confederate to arrive at the correct amount quickly without arousing suspicion. Prior studies have successfully used proportional rather than absolute differences in a similar way to determine confederate positions [7].

The big gap between confederate and subject positions, together with normative statements in the script, permitted the confederate to apply status effects on the subjects. When solving the intellective task, the subjects would anchor their amounts on rational reasoning and factual information. If the confederate awarded a much larger amount than the subjects, this amount would appear illogical to the subjects. When completing the preference task, the subjects would base their amounts on personal preferences. If the confederate awarded a much larger amount than the subjects, this amount would be against the sentiments of the subjects. In both situations, having a confederate amount that was very big would reduce the likelihood of the subjects seeing the confederate as a credible person to determine the "appropriate amount" on award. Therefore, the subjects would only move toward the confederate position because of confederate status. The amount awarded by the confederate was reduced by 5 percent every other round to avert suspicion that might have arisen had the confederate maintained the same position throughout. A subject was considered to have adopted the confederate position if his or her amount was equal to or exceeded that of the confederate.

Data Analyses

A TOTAL OF FORTY-EIGHT SINGAPORE AND FORTY-FIVE U.S. GROUPS completed this study. Data analyses were carried out at a significance level of 0.05. Control checks were carried out for subject gender and age, using the Mann-Whitney test, because these factors could affect status perceptions. The proportion of male to female subjects did not differ significantly across national culture ($\chi^2 = 0.59$, $p = 0.44$), task type ($\chi^2 = 0.59$, $p = 0.44$), and communication medium ($\chi^2 = 1.23$, $p = 0.27$). There were no significant differences in subject age across national culture ($\chi^2 = 2.71$, $p = 0.10$), task type ($\chi^2 = 0.69$, $p = 0.41$), and communication medium ($\chi^2 = 1.83$, $p = 0.18$). A statement in the questionnaire served as a manipulation check for task type: "A very wide range of possible solutions existed for our task." This statement used a seven-point

Likert-type scale where 1 denoted strongly disagree and 7 denoted strongly agree. A HANOVA test[5] [1] showed that subjects solving the preference task (mean = 5.08, std. dev. = 1.59, $n = 184$) agreed on this statement to a significantly greater extent than subjects solving the intellective task (mean = 4.76, std. dev. = 1.79, $n = 188$) ($F = 9.60$, $p = 0.01$). Thus, the manipulation on task type appeared to be successful.

Status influence was computed using a relative measure based on average subject position as a proportion of confederate position, at the beginning and the end of group communication (see appendix). The higher the measure, the stronger was the influence of the higher-status individual during group communication. Sustained influence was computed using a relative measure similar to that for status influence. But it was based on data collected at the beginning of and after group communication (see appendix). The higher the measure, the greater was the amount of status influence remaining over time. Perceived influence was measured using the average score for three questions in the questionnaire (see appendix). These questions used seven-point Likert-type scales where 1 denoted strongly disagree and 7 denoted strongly agree. A higher score would indicate that the subjects were more conscious of influence attempts by the confederate. Cronbach's alpha was 0.73, showing adequate reliability based on Nunnally's criteria [48].

Some confederates were citizens, but others were permanent residents of their respective countries. Thus, control checks were carried out on the data for each country to see if the nationality of confederates would affect the results for each dependent variable. For the Singapore data, no significant differences between groups with citizen confederates and groups with permanent-resident confederates were found for status influence ($t = 0.34$, $p = 0.56$), sustained influence ($t = 0.07$, $p = 0.79$), and perceived influence ($t = 2.30$, $p = 0.13$). Likewise, for the U.S. data, there were no significant differences between groups with citizen confederates and groups with permanent resident confederates in terms of status influence ($t = 0.81$, $p = 0.37$), sustained influence ($t = 0.17$, $p = 0.69$), and perceived influence ($t = 0.14$, $p = 0.71$). Therefore, the nationality of confederates did not appear to be confounded with the manipulation on national culture.

Correlations among the dependent variables were as follows: status influence and sustained influence ($r = 0.87$, $p = 0.01$), status influence and perceived influence ($r = 0.02$, $p = 0.14$), and sustained influence and perceived influence ($r = 0.04$, $p = 0.07$). Since some dependent variables were correlated, the assessment of hypotheses began with a MANOVA test involving all independent and dependent variables. It detected significant effects due to task type ($F = 57.03$, $p = 0.01$) and communication medium ($F = 4.87$, $p = 0.01$), and a near significant effect due to national culture ($F = 2.62$, $p = 0.06$). These results permitted individual ANOVA or HANOVA tests to be applied separately to each dependent variable. The ANOVA test was used to detect significant effects for status influence and sustained influence, which were group-level measures. The HANOVA test was used to detect significant effects for perceived influence, which was an individual-level measure. Table 2 presents the descriptive statistics for the dependent variables. Tables 3 and 4 summarize the results of ANOVA tests on status influence and sustained influence respectively. Table 5 summarizes the results of a HANOVA test on perceived influence.

Table 2.   Descriptive Statistics for the Dependent Variables

	Intellective task		Preference task	
	Unsupported	CMC	Unsupported	CMC
Status influence: mean (std. dev.)				
Singapore	0.68 (0.20)	0.63 (0.33)	2.57 (0.77)	1.68 (0.43)
United States	0.62 (0.29)	0.38 (0.21)	2.90 (1.68)	1.96 (1.38)
Sustained influence: mean (std. dev.)				
Singapore	0.56 (0.18)	0.52 (0.26)	2.08 (0.66)	1.30 (0.49)
United States	0.50 (0.34)	0.31 (0.15)	1.98 (1.18)	1.48 (0.88)
Perceived influence: mean (std. dev.)				
Singapore	3.30 (1.32)	3.37 (1.48)	4.33 (1.34)	3.36 (1.32)
United States	3.84 (1.36)	3.50 (1.48)	4.13 (1.49)	3.88 (1.33)
Number of groups				
Singapore	12	12	12	12
United States	12	11	10	12

Status Influence

A logarithm transformation [67] was performed on the data for status influence so that the data could meet the homogeneity and normality requirements [46] of the ANOVA test. Task type ($F = 161.24$, $p = 0.01$) and communication medium ($F = 13.69$, $p = 0.01$) had significant main effects for status influence. National culture ($F = 2.90$, $p = 0.09$) had a near significant main effect for status influence (see Table 3). The power of this test was 0.39, indicating that the sample size might have been too small to detect a significant difference. These results did not support hypothesis 1a, which predicted that status influence would be higher in Singapore groups than in U.S. groups. However, these results supported hypotheses 2a and 3a, which predicted that status influence would be higher in preference task groups than in intellective task groups and would be higher in unsupported groups than in CMC groups.

Sustained Influence

A logarithm transformation was performed on the data for sustained influence to allow the data to satisfy the homogeneity and normality requirements of the ANOVA test. National culture ($F = 3.98$, $p = 0.05$), task type ($F = 143.68$, $p = 0.01$), and communication medium ($F = 10.69$, $p = 0.01$) had significant main effects for sustained influence (see Table 4). These results supported hypotheses 1b, 2b, and 3b, which predicted that sustained influence would be higher in Singapore groups than in U.S. groups, in preference task groups than in intellective task groups, and in unsupported groups than in CMC groups.

Table 3.   Results of ANOVA Test on Status Influence

$R^2 = 0.68$	DF	SS	F	p
National culture (NC)	1	0.15	2.90	0.0925
Task type (TT)	1	8.09	161.24	0.0001**
Communication medium (CM)	1	0.69	13.69	0.0004**
NC × TT	1	0.09	1.78	0.1853
NC × CM	1	0.05	0.98	0.3246
TT × CM	1	0.01	0.11	0.7420
NC × TT × CM	1	0.03	0.58	0.4466

$* p < 0.05; ** p < 0.01.$

Table 4.   Results of ANOVA Test on Sustained Influence

$R^2 = 0.65$	DF	SS	F	p
National culture (NC)	1	0.20	3.98	0.0495*
Task type (TT)	1	7.31	143.68	0.0001**
Communication medium (CM)	1	0.54	10.69	0.0016**
NC × TT	1	0.10	1.90	0.1722
NC × CM	1	0.01	0.02	0.8793
TT × CM	1	0.01	0.08	0.7730
NC × TT × CM	1	0.09	1.70	0.1960

$* p < 0.05; ** p < 0.01.$

Perceived Influence

No transformation could allow the data for perceived influence to meet the homogeneity and normality requirements of the HANOVA test simultaneously. But the data could satisfy the more important homogeneity requirement [67] without transformation. Significant main effects due to task type ($F = 9.99, p = 0.01$) and communication medium ($F = 7.82, p = 0.01$) were found for perceived influence. In addition, a significant three-factor interaction involving national culture, task type, and communication medium ($F = 4.37, p = 0.04$) was detected (see Table 5). Although the results revealed two significant main effects, these significant main effects should be tempered because a significant interaction was found [35]. Therefore, these results did not support hypotheses 1c, 2c, and 3c, which predicted that perceived influence would be higher in Singapore groups than in U.S. groups, in preference task groups than in intellective task groups, and in unsupported groups than in CMC groups.

The significant three-factor interaction was examined using simple effects analyses [35]. The data were separated by national culture. For the U.S. data, perceived influence did not differ across all treatments. For the Singapore data, a significant two-factor interaction involving task type and communication medium ($F = 7.78,$

Table 5.   Results of HANOVA Test on Perceived Influence

$R^2 = 0.38$	DF	SS	F	p
National culture (NC)	1	5.73	3.46	0.0638
Task type (TT)	1	16.51	9.99	0.0018**
Communication medium (CM)	1	12.93	7.82	0.0055**
NC × TT	1	0.72	0.44	0.5097
NC × CM	1	0.51	0.31	0.5786
TT × CM	1	5.26	3.18	0.0757
NC × TT × CM	1	7.22	4.37	0.0376*
Group [NC × TT × CM]	85	236.16	1.68	0.0009**

* $p < 0.05$; ** $p < 0.01$.

$p = 0.01$) was detected. The Singapore data were then separated by task type. With the intellective task, the unsupported setting and the CMC setting did not produce significant differences in terms of perceived influence. However, with the preference task, perceived influence was significantly higher in the unsupported setting than the CMC setting ($F = 12.94$, $p = 0.01$). This significant result was confirmed using the Mann-Whitney test ($\chi^2 = 10.39$, $p = 0.01$) because the data could not meet the normality requirement. Therefore, the significant three-factor interaction arose because groups under the Singapore sample, unsupported setting, and preference task treatment reported higher perceived influence than groups under other treatments.[6]

Discussion and Implications

SUSTAINED INFLUENCE WAS HIGHER IN SINGAPORE GROUPS than in U.S. groups. Status influence and sustained influence were higher in preference task groups than in intellective task groups. Status influence and sustained influence were also higher in unsupported groups than in CMC groups. Moreover, Singapore groups who completed the preference task in the unsupported setting experienced higher perceived influence than groups under other treatments.

Status influence was not significantly stronger in Singapore groups than in U.S. groups, as hypothesized. The descriptive statistics show that status influence was notably present in both Singapore groups and U.S. groups, especially when groups worked on the preference task (see Table 2). *Moreover, the use of CMC appears to be able to reduce status influence, irrespective of national culture.* The cross-cultural consistency of this finding suggests that it may be applicable across many national cultures. However, this contention needs to be validated by replicating this study in more countries.

Besides showing the cross-cultural robustness of CMC impact on status influence, this study reveals some cross-cultural differences. First, although status influence did not differ significantly between Singapore groups and U.S. groups, sustained influence was significantly higher in Singapore groups than in U.S. groups. *Hence, status*

influence appears to be more sustainable in Singapore groups than U.S. groups. To verify this observation, the Singapore and U.S. data were separated. The average ratio of sustained influence to status influence was 0.81 and 0.74 for Singapore groups and U.S. groups, respectively. Second, status influence was notably present in the unsupported setting with the preference task, regardless of national culture (see Table 2). However, only the Singapore groups under this treatment had significantly higher perceived influence. *Thus, Singapore groups appear to be more conscious of the presence of status influence than U.S. groups.* To verify this statement, the Singapore and U.S. data were separated. For the Singapore data, status influence and perceived influence were significantly correlated ($r = 0.14$, $p = 0.01$). For the U.S. data, status influence and perceived influence were not significantly correlated ($r = 0.01$, $p = 0.88$). Singapore is a high-power-distance country where higher-status individuals are influential and respected. It is also a collectivistic country where harmony is valued [28]. Being accustomed to such a cultural environment, lower-status individuals in Singapore might have been more willing to adhere to positions advocated by higher-status individuals out of respect and for the sake of achieving consensus. Moreover, lower-status individuals might have developed a greater sensitivity toward influence attempts by higher-status individuals.

Implications for Research

This study raises several issues for further research. First, the cross-cultural robustness of its findings can be tested by replicating it in a wider range of national cultures. Countries very high on power distance or very collectivistic (or both) can be explored to see if the use of CMC can still reduce status effects in these national cultures. Conversely, countries very low on power distance or very individualistic (or both) can be examined to see whether strong status effects exist and whether there is a need to reduce status effects with CMC. Many Asian and Latin American countries score very high with regard to power distance and very low (collectivistic) with regard to individualism–collectivism [28]. Many Pacific and Scandinavian countries score very low with regard to power distance and very high (individualistic) with regard to individualism–collectivism [28].

A second direction for further research is to use a wider range of task types. The intellective task and preference task used in this study are "choice" tasks [41], which require groups to communicate and choose an amount of money as their decision. In practice, groups are also involved in "generate" tasks [41], where the objective is to produce as many good ideas as possible. Empirical studies employing these tasks [22, 23] have shown that electronic brainstorming, which involved CMC, could alleviate process losses and raise group productivity. However, these studies used groups without status differences. Higher-status individuals who dominate the idea-generation process unproductively can be detrimental to group productivity. It is not known whether the use of CMC can remedy this situation and whether CMC impact, if any, is consistent across national cultures.

A third possible extension to this research is to examine the impact of other CMC

features on status effects and to test the robustness of these findings across natonal cultures. In this study, the use of CMC helped to reduce status effects in a face-to-face setting. This concept can be extended to a dispersed setting [14, 15], where physically separated group members communicate solely via CMC, to assess whether the removal of visual on top of verbal communication can further reduce status effects. Finally, the anonymity and simultaneity features [13] of CMC can be studied to assess their impact on status effects.

Implications for Practice

The findings of this study demonstrate the important influence of status effects during group communication. Lower-status individuals in Singapore groups and U.S. groups (representing two distinct national cultures) yielded to the influence of higher-status individuals, particularly when they were working on the preference task. However, in situations where excessive status effects are harmful, the use of CMC appears to be able to alleviate these effects in both national cultures. Although these results have been obtained in a laboratory setting, they may be even more profound in organizational settings where power and status asymmetry are greater. But is it always desirable or even possible to curb status effects with CMC?

Organizations function through management hierarchies. Management positions confer power and status on individuals, enabling them to introduce changes [38] and steer organizations [9, 54] in response to environmental demands by influencing others. In some instances, failure to react promptly leads to organizational demise. Since organizational decisions are commonly made by groups [21], attempts to reduce status effects during group communication can result in stalemates and delays and, in some situations, prevent higher-status individuals from acting in the best interests of their organizations. Meetings have also been convened in the name of participative management [69], popular in low-power-distance countries [28]. There are instances where meetings include lower-status individuals who can neither contribute to decision quality nor help to promote decision acceptance. A reduction of status effects in these meetings can reduce communication efficiency without bringing a concomitant increase in communication effectiveness. Hence, it is desirable to employ CMC to curb status effects only when time constraints permit and when lower-status individuals can genuinely contribute to decision quality or decision acceptance. CMC should not be used indiscriminately for group communication.

An objective of meeting design is to identify situations where status effects are helpful and circumstances where they are harmful [64]. Where status effects are harmful, this study shows that the use of CMC is a potential means of reducing these undesirable effects. Nevertheless, in practice, it may not always be possible to use CMC to reduce status effects during group communication for several reasons. First, although this study shows that the use of CMC can reduce status influence, the extent to which its findings can be generalized to organizational groups is unknown. Power and status tend to be less pronounced in temporary experimental groups than permanent organizational groups [4]. Status effects have been shown to inhibit lower-status

individuals from expressing their true opinions when questions of loyalty and alliance are involved [31]. Lower-status individuals may also withhold their views for fear of reprisals [26]. This is especially true in high-power-distance countries, where lower-status individuals are more sensitive toward influence attempts by higher-status individuals. It is also especially true in collectivistic countries, where the expression of dissenting views is discouraged [28].

Second, if higher-status individuals do not want others to curb their influence attempts, they are likely to resist the implementation and use of CMC in their organizations. Third, when group decisions are made using CMC and reduced status effects, higher-status individuals may resist decision implementation. Higher-status individuals often control critical resources [50]. They can hinder successful decision implementation by delaying the availability of critical resources. Hence, attempts to use CMC to reduce status effects are likely to be arduous, particularly in high-power-distance countries. To raise the chances of successful CMC use, CMC should be introduced as a tool to reduce process losses through open discussion and information exchange, rather than as a tool to curb status effects.

Limitations of the Current Study

All empirical studies seek to achieve three important but conflicting objectives: precision of measurement, generalizability of evidence, and realism of setting. Laboratory experiments maximize precision of measurement at the expense of generalizability of evidence and realism of setting. The key strength of laboratory experiments is that they allow causal relationships between variables to be measured precisely and understood [41]. This study exploits the key strength of laboratory experiments fully because its goal is theory testing; hence, the use of undergraduate subjects, graduate student confederates, contrived settings, and artificial tasks. Prior studies have successfully used laboratory experiments in a similar manner to demonstrate key characteristics of human behavior, such as majority influence (reviewed in [39]) and polarization (reviewed in [29]), which existed even in organizational settings. In this study, no attempt has been made to increase generalizability of evidence by selecting confederates and subjects from target populations or to raise realism of setting by employing actual business scenarios because these attempts would reduce precision of measurement [41]. Hence, attempts to generalize the findings of this study to other populations and settings must be done with caution.

In this study, national culture was operationalized using dimensions and scores provided by Hofstede [28]. Although some studies have lent support to the stability of these dimensions, others have noted flaws in Hofstede's [28] work [20].[7] First, all his respondents were employees of a single organization with unique characteristics. This may limit the applicability of Hofstede's [28] findings to people in that organization. Second, items in his instrument did not have face validity and may not be applicable in some situations. This may limit the applicability of Hofstede's [28] scores to a narrow range of situations. In spite of all the merits accorded to Hofstede's

[28] work, these limitations remain a plausible explanation for the lack of strong support for the hypotheses on national culture. Nevertheless, the large sample of subjects from each country (192 Singapore and 180 U.S. subjects), drawn from populations that were similar in gender and age (undergraduate students), is likely to be representative of the national culture in each country.

Conclusion

FIRST AMONG THE CONCLUSIONS SUPPORTED BY THIS STUDY is that status influence was notably present in both Singapore groups and U.S. groups. In situations where status effects are harmful, CMC appears to be useful for reducing such harmful effects in both national cultures. Second, status influence was more sustainable and more strongly perceived in Singapore groups (a high-power-distance and collectivistic country) than in U.S. groups (a low-power-distance and individualistic country). Therefore, if the situations where status effects are detrimental should occur in a high-power-distance and collectivistic country, it may be more helpful to use CMC to reduce such detrimental effects.

In summary, this study suggests that some aspects of human behavior and impact of CMC intervention may be universal across national cultures while others may be culture-specific. Such mixed results suggest that some existing theories and practices on CMC may be culture-specific. Future CMC research can pursue this issue by examining current theories and practices on CMC, in terms of the cultural setting on which they have been formulated, and evaluating these theories and practices for their robustness across national cultures [28]. A systematic body of CMC research in this direction can add a valuable cultural perspective to existing theories and practices on CMC. Although this study focuses on CMC, it also raises the general issue of cultural relativism in the theories and practices on information systems. This study demonstrates how cross-cultural studies can add a cultural perspective to existing theories and practices. As businesses proliferate globally, as people from dissimilar national cultures meet increasingly to make important business decisions, it is imperative that a cultural perspective be added to existing theories and practices.

NOTES

1. This paper focuses on national culture. Other aspects of culture, such as organizational culture [55], are outside its scope.

2. Although a factorial design permits testing of interactions, no interactions have been hypothesized because of a lack of relevant theoretical support.

3. Control checks were later carried out on the data for each country to see whether groups with citizen confederates would produce different results from groups that had permanent resident confederates.

4. Confederate responses were similar in terms of the amounts and reasons given in each round of group communication because they followed the same script. However, their tone and loudness of voice could not be scripted and had to be controlled through random assignment.

5. The hierarchical ANOVA (HANOVA) test nests individual data within groups and group data within treatments when adjusting for group level effects. This procedure has greater statistical power than the ANOVA test because it increases the degrees of freedom during statistical analyses.

6. All six possible ways of decomposing the independent variables yielded the same result, indicating that this interaction was stable.

7. These studies did not suggest remedies for the flaws in Hofstede's work [28]. Neither did they propose alternative dimensions of and scores for national culture.

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APPENDIX

Let

SI_i	= Initial amount awarded by subject i;
SF_i	= Final amount awarded by subject i;
SP_i	= Postmeeting amount awarded by subject i;
CI	= Initial amount awarded by the confederate;
CF	= Final amount awarded by the confederate.

$$A = \left(\sum_{i=1}^{4} SI_i \right) \Big/ CI \,;$$

$$B = \left(\sum_{i=1}^{4} SF_i \right) \Big/ CF \,,$$

where Maximum $(SF_i) = CF$.

$$C = \left(\sum_{i-1}^{4} SP_i \right) \Big/ CF \,,$$

where Maximum $(SP_i) = CF$.

$$\text{Status influence} = (B - A) \,/\, A;$$

$$\text{Sustained influence} = (C - A) \,/\, A.$$

Questions measuring perceived influence:

1. The teaching assistant strongly influenced the opinions of others.
2. Our decision reflected the opinion of the teaching assistant.
3. The teaching assistant influenced our decision more than others.