

Online focus groups

An in-depth comparison of computer-mediated and conventional focus group discussions

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This study compares face-to-face (FTF) focus groups with focus groups conducted via computer-mediated communication (CMC), using a range of outcome, process and subjective measures. Sixteen groups of three undergraduates participated in focus group discussions under FTF and CMC conditions on two different topics. Topics, communication condition and order of discussion were counterbalanced over groups. Among the results, it was found that, after controlling for the greater number of contributions made by participants in FTF discussions, more ideas and answers were generated in CMC than in FTF discussions; 21, 20 and seven participants preferred the CMC, FTF and 'either' discussion setting, respectively. The results suggest that CMC may be a viable alternative to FTF focus groups for certain purposes. Limitations and directions for future research are discussed.

Introduction

Internet use has grown tremendously over the last decade. There are currently 679.7 million people who have access to the internet worldwide (Global Reach 2003). This growth has led to intense academic interest in the social consequences of using computers, especially in their use by groups of people to hold discussions and reach decisions without the necessity of meeting face to face (e.g. Hiltz *et al.* 1987; Reid *et al.* 1996). Direct comparisons between computer-mediated communication (CMC) and face-to-face (FTF) meetings have produced results that are generally unfavourable for CMC, particularly when online groups have to reach agreement on delicate matters of judgment (e.g. Straus & McGrath 1994). The interesting exception to this pattern is for brainstorming discussions: here, online groups often outstrip their FTF counterparts in both the

quantity and the variety of the creative ideas they produce (Valacich *et al.* 1994; Cooper *et al.* 1998).

This is a potentially important finding for researchers and marketing professionals who use focus group methods in their work. In normal practice, focus groups involve FTF discussions between three to ten participants, led by a moderator who facilitates the discussion and keeps participants focused on the particular topic of interest (Frey & Fontana 1993; Greenbaum 1998). In a market research context, focus groups are used mainly to obtain in-depth understanding of participants' perspectives and opinions on new products (Morgan & Kruegar 1993). But their resemblance to brainstorming groups is no accident – focus groups are popular precisely because they generate a 'flow of input and interaction related to the topics that the group is centred around' (Edmunds 1999). However, like brainstorming groups, focus groups do have their drawbacks. In addition to the well-known problems of process loss in FTF discussion (McGrath 1984), practical difficulties arise over problems with social aspects of group participation, access to key demographic groups, and constraints on time and distance (Edmunds 1999).

It is here that the internet offers a potential breakthrough. Conducting focus groups online could help reduce costs and remove the constraints associated with timing and location – participants can log in at home at a prearranged time that is convenient for them. Furthermore, the visual anonymity and psychological distance of the internet could stimulate group participation and encourage self-disclosure, particularly for individuals who might otherwise hesitate to participate in an FTF group meeting. In addition, the positive benefits that have been observed in CMC brainstorming – particularly the opportunity for participants to key in ideas in parallel without having to wait their turn to speak (Valacich *et al.* 1994) – suggest that the internet might not simply offer a cheaper method for conducting focus groups, but actually produce results that are superior to those that can be achieved in the FTF setting.

In the following sections, we review the psychological evidence on the strengths and weaknesses of CMC as it might relate to online focus groups, and identify key features of online communication that could help or hinder focus group discussions.

Amount of communication

It takes longer to type than it does to talk. For this reason we expected that there would be significantly more words contributed in FTF groups than

CMC. This could be a problem for CMC focus groups as they may not be as productive as FTF. However, it may be that CMC groups compensate for the greater amount of time it takes to write a message by being more concise in their communication. Hiltz *et al.* (1987) reported FTF communication to be around twice the amount of CMC. To compensate for this in the present study, the CMC groups ran for twice the amount of time as FTF. Therefore there should be no difference overall.

Equality of participation

The simultaneous nature of CMC is thought to lead to greater equality of participation. This is because it may decrease production blocking, as group members can contribute whenever they like without having to wait for someone else in the group to stop talking, as is often the case in FTF communication. This reduction in competing for 'floor time' should also lead to reduced domination by a single member of the group and more equal participation across the group (Nunamaker 1997).

In decision-making tasks, the CMC attribute of being able to contribute simultaneously may be a hindrance if time to reach a decision is scarce, or if one person holds more task-relevant information than another (Hiltz *et al.* 1987). However, in focus groups this may be seen as a process gain as researchers can use them to find out as much information as possible from each individual.

The visual anonymity provided by CMC can lower participants' inhibitions, leading to the observation that there is more equality in participation in CMC than FTF groups (Hiltz *et al.* 1987; Walther & Burgoon 1992). Evaluation apprehension and conformity pressures may also be reduced, leading to greater participation by members of the group who may otherwise have felt inhibited (Diehl & Stroebe 1987; Straus 1996).

Disinhibited communication

The visual anonymity provided by CMC may lead to deindividuation, where a person may lose awareness of their own individuality and that of other members (Prentice-Dunn & Rogers 1989; Lea & Spears 1995). This may lead to anti-normative behaviour such as the use of profanities and other socially undesirable behaviour, termed 'flaming' (Hiltz *et al.* 1989; Guzzo 1996). However, the evidence for this is very mixed, with many studies finding no evidence of it occurring (Lea *et al.* 1992). As uninhibited

communication such as flaming is not a welcomed feature of focus groups, if CMC groups are found to have a high rate of such behaviour then researchers will have to think hard about using the medium. Our study looked at the frequency of flaming in both CMC and FTF groups.

Group interaction

In general, most studies have found that CMC group members feel freer to find fault with others' ideas, leading to more disagreements and criticism than in FTF (e.g. Straus 1997), which may not always be a bad thing in focus groups; a substantial amount of research has found that task conflict *at certain levels* helps groups generate better ideas (Valacich & Schwenk 1995). Straus (1997) suggested there may be more disagreements in CMC because, unlike in FTF communication, where disagreements can be signalled by cues such as averting one's gaze and/or shaking one's head in disagreement, users have to compensate verbally for the lack of non-verbal cues. Therefore, we predicted that there would be more disagreements in CMC because users have to compensate for the lack of social context cues that would otherwise express disagreement.

This lack of social cues often leads to excessive task focus in CMC groups, which can be beneficial as it reduces the process loss of diverging from the task (Straus 1997), but it can also lead to less supportive socio-emotional communication. For a focus group to be effective, a balance of task and socio-emotional communication is needed. A comparison between FTF and CMC groups in task and socio-emotional communication was carried out in the present study by using Bales' interaction process analysis (IPA) (Bales 1950a).

Self-disclosure

Self-disclosure, defined by Archer (1980) as 'revealing personal information to others', is thought to be a good thing in focus groups (Edmunds 1999). The visual anonymity provided by CMC can lead to lowered public self-awareness (as others cannot see you) and heightened private self-awareness (as one can reflect on one's own thoughts and how to type them), leading to increased self-disclosure. Joinson (2001) found support for this; higher levels of self-disclosure were found in CMC than in FTF discussions. Therefore we expected there to be more instances of self-disclosure in CMC than FTF groups.

Ideas generated

As mentioned above, past research has concluded CMC to be inferior to FTF groups due to the difficulty in reaching consensus. As focus groups do not require consensus there is no reason to believe there will be any difference in the outcome between the two groups. In fact, because of the simultaneous communication employed by CMC, it is expected that, as in brainstorming research (Diehl & Stroebe 1987), there will be more ideas/answers generated in CMC than FTF, which is a good thing from the point of view of a focus group as one can expect a more diverse set of ideas.

Subjective experiences

Satisfaction is the main element of subjective experience that has been studied in CMC research. It has generally been found that participants in CMC are less satisfied with the task compared to FTF (e.g. Straus 1996). To investigate this, we designed a new questionnaire to explore various aspects of subjective experience, including satisfaction, vulnerability and comfort. To gain insight into the underlying reasons behind media preference, participants were asked to give reasons for their preferences, something that had not been investigated in previous research.

There is a vigorous debate among practitioners and marketing professionals on the merits of online focus groups. For example, Greenbaum (2000) focuses on what is lost using CMC for focus group discussions, concluding that online focus groups are not a viable alternative to FTF focus groups. Others, however, have looked at the advantages that CMC affords over FTF focus groups (e.g. Mindwave Research 2003), and offer commercial platforms for people to use them effectively. Our own review of the psychological evidence above suggests that process losses known to impair FTF discussion groups are just as likely to occur in FTF focus groups, and that CMC may have the potential to overcome many of these process losses.

In his paper, Tse (1999) suggests that 'a controlled experiment should be conducted to compare the effectiveness of focus group discussions in an electronic environment and discussions in a traditional face-to-face environment. Rigorous experiments of these kinds should boost our confidence in applying the new technology to focus group discussions' (1999, p. 414). The present study is an attempt to address this concern, and to contribute to the debate among practitioners as to whether CMC presents a genuine and usable alternative to FTF focus groups. Here we

investigate experimentally – under time-limited but controlled conditions – whether differences in objective outcomes, discussion process, and subjective assessments between FTF and CMC focus group discussions exist, and the extent to which focus group discussions might benefit from the process gains normally associated with online communication.

Methodology

Study participants

Forty-eight undergraduates participated in the study, resulting in 16 three-person groups. Groups were divided equally into four conditions.

Experimental design

The study used a within-subjects design, with each group using both communication modes (CMC and FTF) and discussing both topics (attitudes towards marriage and body image) in fully counterbalanced orders.

Both the FTF and CMC focus groups were conducted in a computer laboratory. For the FTF focus groups, the three participants and one of the experimenters sat facing one another in a circle. Participants were identifiable by participant numbers (1, 2 and 3) written on a sticker that they each wore. The FTF focus groups ran for ten minutes and were video-recorded, and later transcribed verbatim for analysis.

For the CMC focus groups, the participants and one of the experimenters sat at a computer in each of the four corners of the laboratory so that each person had his/her back to two other people, and each was adjacent to one other person.

Chatspace Version 2[®] (2001), a synchronous computer conferencing program, was used in the present experiment. The computers were all separated by wooden partitions, which prohibited visual contact between participants. Participants were asked not to talk to one another during this phase of the experiment – groups communicated using Chatspace only. Participants typed their contribution into a rectangle in the bottom half of the computer screen and pressed the ‘enter’ key when they were ready to send it. This resulted in their contributions appearing in a bigger window above the rectangle on the experimenter’s and each of the other participants’ screens. Messages were recorded in the order they were sent

and could be referred to by using the scroll bar at any point in the experiment.

Participants were identifiable by their participation number, which accompanied their contributions on the screen. CMC focus groups were 20 minutes in duration to compensate for the slower rate of communication via CMC (Hiltz *et al.* 1987). The discussion was recorded by the computer and printed out at the end of the experiment to be analysed later.

Focus group topics

The two topics discussed were attitudes towards marriage and factors that may affect body image. These were chosen as they are thought to be emotionally neutral topics to which most people can contribute. One of the experimenters performed the role of the focus group facilitator.

Questionnaire development

As no standard measures were available the authors designed a novel questionnaire to explore subjective experiences in this experiment. Thirteen questions were presented at the end of the first focus group discussion, and 14 after the second focus group discussion (the same 13 questions as the first questionnaire but with an extra question). Twelve were fixed-response questions, with a six-point scale of 1 = very to 6 = not very. These questions probed satisfaction (with outcome of task and with communication medium), comfort in communicating using the medium; how involved, inhibited and vulnerable they felt; how easy they found it to follow their group-mates' ideas; how focused they were on their own and on others' contributions; how aware they were of others' reactions to their contributions; how easy they found it to appreciate their group-mates' feelings; and how much they enjoyed their experience of being in a group. The questionnaire that was given at the end of the second phase contained an additional question asking which medium was preferred and why. To minimise potential carryover effects, 'distracter' items were added and question order was randomised in the two questionnaires.

Procedure

On signing up for participation in the experiment, participants were informed about the topics of the focus groups and that they would be discussing one of the topics online and the other one face to face. This was reinforced by a verbal briefing on arrival at the laboratory.

On completing the first phase (CMC or FTF; topic 1 or 2), participants were asked to complete the questionnaire, after which they were briefed on the second phase. Following this phase they were asked to fill in the second questionnaire. Participants were then debriefed, and asked not to discuss the nature of the experiment with those who had not yet participated, so as not to jeopardise the validity of the experiment.

Dependent measures

PROCESS MEASURES

Group process measures were assessed from transcripts of the focus group discussions. The basic unit of analysis was the number of individual words uttered in FTF discussion and keyed in during CMC discussion. In addition, individual contributions to the discussion were identified. In the CMC condition these were defined as self-contained entries by participants to the message window, entered with the return key. In the FTF condition, contributions were defined as individual speaking turns, including one-word utterances, such as brief backchannel acknowledgements.

MEASURES OF EQUALITY OF PARTICIPATION

Individual participation rates were calculated as the number of words per participant divided by the total number of words generated by all three participants (Straus 1996). The number of contributions made by each participant was also recorded.

INTERACTION PROCESS ANALYSIS

Components of Bales' IPA (Bales 1950a, 1950b) were used in the present experiment as one of the measures of group process. Normally Bales' IPA is used only for FTF interaction but it has also been used successfully in CMC (e.g. Hiltz *et al.* 1987; Reid *et al.* 1996).

Typically, when using IPA, communication is broken down into simple units (the smallest discriminable unit of verbal or non-verbal behaviour that can be classified meaningfully) and classified into one of Bales' categories. In this experiment only verbal behaviour was used for analysis, and classification was carried out at the level of the whole contribution. Consequently, because the 'unit' was considerably larger it could be classified into multiple IPA categories.

The relevant IPA categories used to analyse the focus groups were positive social-emotional acts, which included tension release, solidarity and agreement; negative social-emotional acts, which included acts of disagreement and antagonism; and task-orientated acts or questions of

opinion and orientation. Coding was applied to the written transcripts from both conditions, and frequencies of contributions that included each act were calculated for each participant. The facilitators' contributions were not coded.

SELF-DISCLOSURE

Self-disclosure is an instance where someone reveals something personal about themselves (about their views, opinions, fears, family, etc.). Self-disclosures were split into three categories regarding their content: Positive, Negative and Neutral/Ambiguous (based on Joinson 2001).

Objective measures

PRODUCTIVITY

Productivity was measured by the total number of ideas/answers generated in the focus group to do with the topic being discussed.

NUMBER OF QUESTIONS ASKED BY THE FACILITATOR

The number of questions asked by the facilitator was recorded to check for differences between conditions.

Checks for coding reliability

IPA, self-disclosure and productivity coding was carried out by the first author. In order to check coding reliability, two randomly selected transcripts from each condition (25% of the transcripts) were independently coded by another pre-trained coder, blind to the experimental condition of the transcripts. All but IPA 'opinion questions' obtained kappas in excess of 0.75, rated as 'excellent' by Bakeman and Gottman (1997). For opinion questions, $\kappa = 0.67$, which these authors classed as 'good'. This suggests that the first author's coding is sufficiently reliable to use throughout the analysis.

Level of analyses

There are likely to be social interaction processes and social influences that affect how people behave when they are in a group situation. If there are significant group effects for certain variables then it would be misleading to analyse these variables at the level of the individual as the data are not independent, but rather dependent on the other members of the group. Because of this, dependent variables were analysed either at the group or the individual level depending on whether the variance of the group was significantly more than the variance of the individual. In cases where one

of the comparisons was significant at the group level and one was significant at the individual level, the analysis was carried out at the group level. Those results analysed at the group level were averaged across members of the group.

Results

Group vs individual analysis for process and outcome measures

Variance components tests showed individuals varied more between themselves than between groups in terms of words contributed, acts of tension release, total self-disclosure, negative self-disclosure, neutral self-disclosure and flaming. Groups varied more than individuals in number of contributions, number of agreements, acts of solidarity, positive socio-emotional acts and new ideas/answers.

Process measures

Amount of communication

Despite CMC groups having double the time allowance (20 minutes and 10 minutes respectively), there was a greater amount of communication in the FTF groups. The mean number of words produced by each individual in the FTF focus groups ($M = 492.75$ words, $SD = 207.43$) was significantly higher than in the CMC focus groups ($M = 274.19$ words, $SD = 102.13$: $t(47) = 7.05$, $p < 0.001$). If one controls for the difference in the amount of time CMC and FTF groups received, then the ratio is 3.59 words in the FTF focus groups for every 1 in the CMC groups. So, in line with the first prediction, FTF groups generated more communication than CMC groups. This was despite the extra time given for CMC groups.

Equality of participation

There was no evidence of a significant difference between the mean participation rate of FTF groups ($M = 0.33$, $SD = 0.13$) and CMC groups ($M = 0.33$, $SD = 0.11$: $t(47) = -0.029$, $p > 0.05$). Further analysis depicts the pattern of participation in more detail (see Figure 1). Following Straus's (1997) methodology, the most dominant, least dominant and median participants were identified in terms of their participation rates. From visual inspection of Figure 1, one can see that the dominant participant in CMC ($M = 0.46$, $SD = 0.07$) contributes a lower proportion of group communication than the dominant participant in FTF ($M = 0.48$,

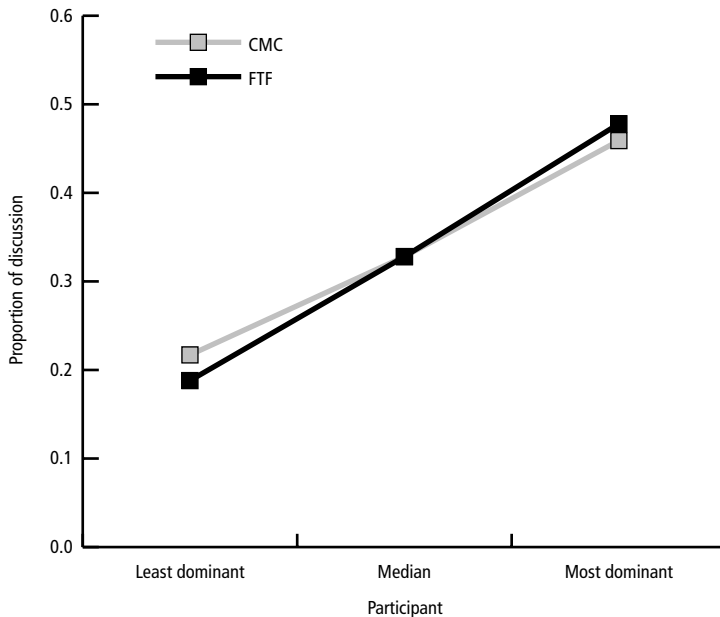


Figure 1 Participation rates of the most dominant, least dominant and median participant in FTF and CMC groups ($n = 48$ in both conditions)

SD = 0.06). Conversely, the least dominant participant in CMC ($M = 0.22$, SD = 0.04) contributes more than the least dominant participant in FTF ($M = 0.19$, SD = 0.04). There is little difference between the median participants ($M = 0.31$, SD = 0.05; $M = 0.33$, SD = 0.05, for CMC and FTF respectively).

Related-sample Bonferroni t -tests were carried out on the data.¹ The difference between the most dominant, median and least dominant participant across the conditions was not found to be statistically significant ($t(15) = 1.93$, $p > 0.05$; $t(15) = -0.69$, $p > 0.05$; $t(15) = -0.82$, $p > 0.05$ respectively). Examining participation rates within the medium showed the dominant participant contributed significantly more than the median speaker in both FTF ($t(15) = -5.80$, $p < 0.01$) and CMC ($t(15) = -5.55$, $p < 0.01$) conditions. Similarly, the median participant contributed significantly more than the least dominant participant in both CMC ($t(15) = -5.91$, $p < 0.01$) and FTF ($t(15) = -7.01$, $p < 0.01$) focus groups.

¹ Critical value of Bonferroni- t for 15 degrees of freedom and 6 comparisons at the 0.05 level = 3.04 and at 0.01 level = 3.82.

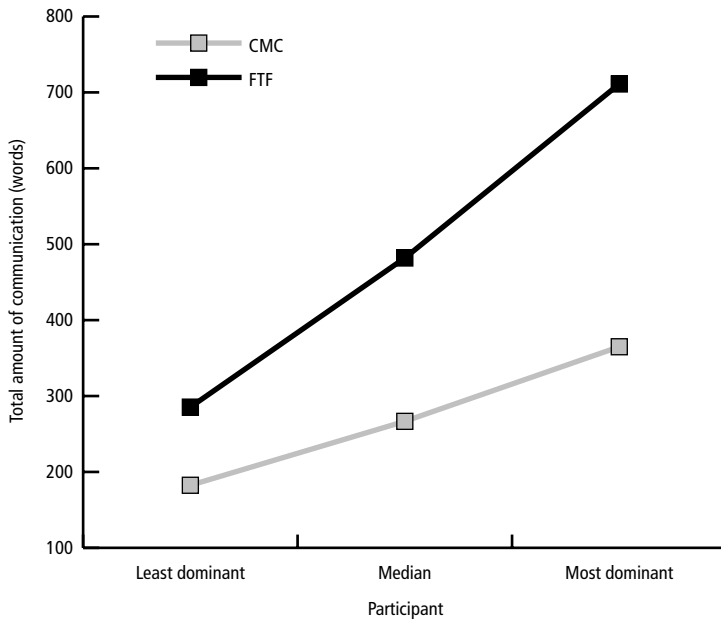


Figure 2 Mean number of words contributed by the most dominant, least dominant and median participant in FTF and CMC groups ($n = 48$ in both conditions)

These results suggest that participation is no more equal in FTF than in CMC. The most dominant participant in FTF contributed 1.9 times as many words as the most dominant in CMC ($M = 707.38$ and $M = 367.06$ respectively): $t(15) = 4.03$, $p < 0.01$. The median participants in FTF contributed 1.8 times as many words as their counterpart in CMC ($M = 481.94$ and $M = 269.38$ respectively): $t(15) = 5.89$, $p < 0.01$. The least dominant participant in FTF contributed 1.5 times as many words as the least dominant participant in CMC ($M = 288.94$ and $M = 186.13$ respectively): $t(15) = 8.94$, $p < 0.01$. Looking at these results, the prediction that there will be more equal participation in CMC groups is not supported. Furthermore, if analysis is done on actual amounts of words contributed rather than proportions (see Figure 2), it can be seen that there is a significant² reduction in communication from all participants in CMC compared to FTF, with the greatest reduction occurring in the communication of the most dominant participant.

² Critical value of Bonferroni- t for 47 degrees of freedom and 3 comparisons at the 0.05 level = 2.49 and at 0.01 level = 3.09.

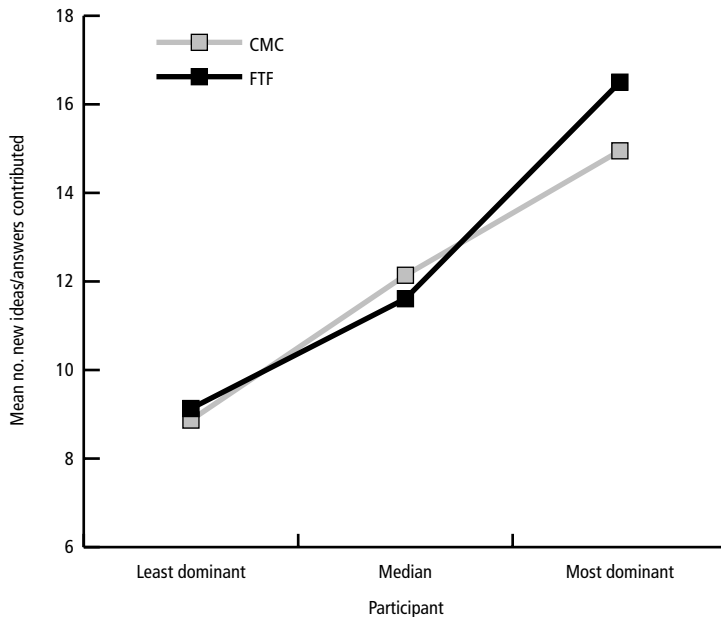


Figure 3 Mean number of new ideas/answers contributed by the most dominant, least dominant and median participant in FTC and CMC groups ($n = 48$ in both conditions)

As can be seen from these results, the most dominant participant in CMC contributed 1.2 times as many words as the least dominant participant in FTF. These findings mirror those by Straus (1997), suggesting the so-called ‘equalisation effect’ of CMC may actually be a ceiling effect, restricting participants from contributing as much as they are potentially able to. However, this may be a misleading interpretation. Participants may contribute fewer words in CMC because their contributions are more concise (Hiltz *et al.* 1987). To investigate this explanation further the mean number of ideas contributed by the least, median and most dominant participant was considered. Figure 3 shows the results.

As can be seen from Figure 3, despite the smaller number of words contributed in CMC, there is little difference in the number of new ideas/answers generated across the two media. Indeed t -tests found no significant difference³ between each participant in FTF and their counterpart in CMC: $t(15) = 0.80$, $p > 0.05$, for most dominant participants in FTF ($M = 16.50$, $SD = 4.29$) compared to CMC ($M = 14.93$,

³ Critical value of Bonferroni- t for 47 degrees of freedom and 3 comparisons at the 0.05 level = 2.49 and at 0.01 level = 3.09.

SD = 6.59); $t(15) = -0.47, p > 0.05$, for median participants in FTF ($M = 11.56, SD = 3.53$) compared to CMC ($M = 12.13, SD = 4.79$); and $t(15) = 0.09, p > 0.05$, for least dominant participants in FTF ($M = 9.06, SD = 3.82$) compared to CMC ($M = 8.94, SD = 4.54$). This suggests that participants are being more concise with their contributions.

Bales' IPA

Table 1 summarises the results of the related t -tests on differences between communication media in the actual amounts of contributions falling into each IPA category. Tension release is not included in the table as it is analysed at the individual rather than at the group level.

As can be seen in Table 1, FTF groups contained significantly more instances of agreement, solidarity and socio-emotional acts, as predicted.

Table 1 Descriptive and inferential statistics for Bales' IPA categories analysed at the group level

IPA category	M [†]	SD	$t(15)$ [‡]
Agreement			
Face-to-face	9.71	4.06	7.89**
Computer-mediated	2.33	1.81	
Disagreement			
Face-to-face	1.67	1.60	0.00
Computer-mediated	1.67	1.60	
Solidarity			
Face-to-face	11.94	5.65	6.56**
Computer-mediated	2.98	1.93	
Positive socio-emotional acts			
Face-to-face	12.58	4.90	7.30**
Computer-mediated	3.94	2.78	
Negative socio-emotional acts			
Face-to-face	1.92	1.29	-0.99
Computer-mediated	2.35	2.29	
Orientation questions			
Face-to-face	1.79	1.02	1.35
Computer-mediated	1.29	1.07	
Opinion questions			
Face-to-face	0.40	0.67	0.61
Computer-mediated	0.27	0.43	

[†] Mean number of acts initiated by each participant for each IPA category

[‡] Critical value of Bonferroni- t for 15 degrees of freedom and 7 comparisons at the 0.05 level = 3.11 and at the 0.01 level = 5.08

** $p < 0.01$

There were no significant differences between the two media in disagreement, negative socio-emotional acts, orientation questions or opinion questions.

To ensure that these differences were not just due to the greater number of contributions generated by FTF groups, *t*-tests were also carried out on proportions of communication in each of these Bales categories. The results followed the same pattern.

An interesting property of the results is that CMC and FTF both have similar profiles in the Bales acts. The order of occurrence of each type of act (from most to least) is almost identical, implying that although there seem to be differences in actual amounts of each act across media, the same profiles of interaction apply.

The eighth IPA category examined was tension release. As mentioned earlier, this was analysed at the individual level. There was no evidence of a significant difference between FTF ($M = 0.94$, $SD = 1.28$) and CMC groups ($M = 0.90$, $SD = 1.19$, $t(47) = 0.184$, $p > 0.10$). Again, to ensure this result was not the consequence of FTF groups generating more contributions, related-sample *t*-test analysis was then carried out on the proportion of tension release rather than actual frequency data. There was still no evidence of a significant difference between the media ($t(47) = 0.99$, $p > 0.10$). This is surprising as tension release is a positive socio-emotional act, and as reported earlier positive socio-emotional acts were higher in FTF than CMC. Instances of tension release in both media were relatively low (less than 1.0).

Flaming

Flaming, or 'uninhibited behaviour', was rare in both conditions. Only two of the 16 FTF groups and one of the 16 CMC groups demonstrated this behaviour, the occurrence of which averaged less than one word per person in these three groups. There was no evidence of a significant difference between CMC focus groups ($M = 0.02$, $SD = 0.14$) and FTF focus groups ($M = 0.06$, $SD = 0.32$), $t(47) = 0.18$, $p > 0.10$.

Self-disclosure

There was significantly more negative and neutral disclosure in FTF focus groups ($M = 0.85$, $SD = 1.27$; and $M = 1.13$, $SD = 1.48$ respectively) than in CMC focus groups ($M = 0.15$, $SD = 0.41$; and $M = 0.42$, $SD = 0.65$ respectively), $t(47) = 4.08$, $p < 0.01$; and $t(47) = 3.02$, $p < 0.05$, for negative and neutral self-disclosure respectively.

Positive self-disclosure, unlike the other types of self-disclosure was analysed separately at the group level as independence of observations was violated. There was no evidence of a statistically significant difference in the amount of positive self-disclosure between CMC focus groups ($M = 0.79$, $SD = 1.02$) and FTF focus groups ($M = 0.50$, $SD = 0.49$), $t(15) = 1.03$, $p > 0.10$.

When proportions of self-disclosure were used, this changed the pattern of results with only negative self-disclosure being significantly more in FTF than in CMC. This suggests that the significant effects found in the first analysis were due to the fact that there were significantly more contributions made by participants in the FTF focus groups.

It should be noted that if we visually inspect these means one can see that the instances of self-disclosure were relatively low – averaging less than one in all cases.

Objective measures

New ideas/answers

As hypothesised, there were significantly greater proportions of new ideas/answers generated in CMC ($M = 0.69$, $SD = 0.18$) than in FTF focus groups ($M = 0.53$, $SD = 0.16$), $t(15) = 2.95$, $p < 0.05$. This difference was detectable only when proportions were used to take into account the greater amount of words given by FTF groups. When actual frequencies were used the difference between new ideas/answers in CMC ($M = 12.0$, $SD = 5.06$) and FTF focus groups ($M = 12.38$, $SD = 3.59$) was non-significant, $t(15) = -0.27$, $p > 0.10$.

Questions asked by the facilitator

No significant differences were detected when looking for differences between actual frequencies of questions asked by the facilitator across the two communication media ($M = 6.63$, $SD = 1.89$; $M = 7.56$, $SD = 1.71$ for CMC and FTF focus groups respectively), $t(15) = -1.38$, $p > 0.10$. However, when proportions were used, a significant difference in the proportion of questions asked in CMC focus groups ($M = 0.29$, $SD = 0.01$) and those in FTF was found ($M = 0.24$, $SD = 0.01$), $t(15) = 2.40$, $p < 0.05$. So the facilitator asked a greater proportion of questions in CMC than FTF.

Subjective measures

Reliability and factor analysis of questionnaire items

Because the questionnaire used was designed by the authors and therefore had not been used before, some exploratory factor analysis was carried out. From correlation matrices of the questionnaire items it was apparent that certain items correlated quite strongly with each other. A factor analysis was conducted to see if any of the questions overlapped. If they did, this may explain why a group of variables were significant as this would hint that they were all measuring the same underlying factor.

Principal components analysis with orthogonal VARIMAX rotation yielded three factors with eigenvalues greater than 1.0, which in the CMC condition accounted for 72.1% variance and in the FTF condition accounted for 63.4%. These factors were interpreted as 'positivity', 'being able to communicate' and 'attention to others'. They varied in their importance in the two media, with factor 1, 'positivity', accounting for most of the variance in both CMC and FTF conditions (30.7% and 29.4% respectively). 'Being able to communicate' was the second best factor in explaining variance in CMC (21.6%) but the third in FTF (14.7%). 'Attention to others' was the second best factor in explaining variance in FTF (19.3%) and the third in CMC (19.8%). Given the small amounts of variance involved, it is not surprising that some slippage between factors 2 and 3 results.

Factors were taken to account for an item if the factor loadings were above absolute values of 0.5. Table 2 overleaf shows an adapted version of the factor analysis table in which only the factor loadings with absolute values that are above 0.5 are included. There was one question that differed between the two media. This was 'How involved did you feel in the discussion?' This item fell into the 'positivity' factor in FTF and the 'being able to communicate' factor in CMC.

These factors will be taken into account when analysing the results of the questionnaires.

Analysis of questionnaire results

A related samples ANOVA was carried out on the data to investigate differences in questionnaire response over the two conditions. It was found that there was a significant effect of the independent variable communication media on the dependent variable questionnaire responses, $F(1, 44) = 16.18, p < 0.001$. There were no significant interactions between questionnaire item and condition order ($F(11, 484) = 0.59, p > 0.10$) and no significant interaction between questionnaire item and topic order

Table 2 Factor loading matrix showing factor loadings with absolute values more than 0.5 for questionnaires given in CMC and FTF conditions

Item	Positivity	Positivity	Being	Being	Attention	Attention
	CMC	FTF	able to communicate CMC	able to communicate FTF	to others CMC	to others FTF
1 How satisfied were you with the outcome of the discussion?	0.76	0.63				
2 How satisfied were you with communicating with other members?	0.64	0.59		0.53	0.57	
3 How comfortable did you feel communicating with the other members?			0.75	0.81		
4 How involved did you feel in the discussion?		0.70			0.68	
5 How inhibited did you feel participating in the discussion?			0.72	0.82		
6 How vulnerable did you feel in giving your contributions?			0.77	0.66		
7 How easy was it to appreciate your group-mates' feelings?					0.78	0.57
8 How focused were you on your contributions?	0.70	0.81				
9 How aware were you of other group members' reactions to your contributions?					0.79	0.78
10 How focused were you on the contributions made by the other group members?	0.89	0.72				
11 How easy was it to follow your group-mates' ideas?	0.71	0.62				
12 How much did you enjoy the experience of being in the group?	0.69	0.63				

($F(11, 484) = 1.06, p > 0.10$). Tests of between-subjects effects showed no main effect of condition order ($F(1, 1) = 1.98, p > 0.10$) or topic order ($F(1, 1) = 0.793, p > 0.10$).

To calculate exactly which of the questionnaire items were significantly different from each other across the two media, multiple related *t*-tests were used with the significance levels adjusted for the multiple comparisons made using the Bonferroni-*t* correction. Table 3 overleaf shows the descriptive statistics for the questionnaire items across media and the results of the *t*-tests.

As can be seen from Table 3, there were significant differences between CMC and FTF in satisfaction with method of communicating, appreciating other group-mates' feelings, focus on others' contributions and ease of following others' ideas, in that FTF groups were more satisfied with this method of communicating ($t(47) = -2.29, p < 0.05$), more appreciative of their group-mates' feelings ($t(47) = -4.45, p < 0.05$), more focused on others' contributions ($t(47) = -3.38, p < 0.05$) and found it easier to follow others' ideas ($t(47) = -4.46, p < 0.05$). It should be noted that although these differences are significant, all the means are in the same direction for each question – that is, they are both towards 'very' or both towards 'not very'.

There were no significant differences between CMC and FTF in responses to inhibition, comfort and focus on their own contributions. Nor was there any evidence of a significant difference between CMC and FTF in enjoyment of experience of being part of the group. Both CMC and FTF groups found themselves fairly comfortable with the medium ($M = 2.4$ and $M = 2.2$ respectively). Participants in both media felt more uninhibited than inhibited ($M = 4.4$ and $M = 4.5$ for FTF and CMC respectively). In terms of focus on own contributions, FTF and CMC groups both felt they were focused on their contributions ($M = 2.4$ and $M = 2.3$ respectively) and both communication media groups enjoyed the experience of being in a group ($M = 2.4$ and $M = 2.5$ respectively).

In relation to the factor analysis carried out earlier, if there are these three underlying constructs that were labelled as 'positivity', 'being able to communicate' and 'attention to others', then one would expect that if one item was significant that loaded highly on one of these factors, then others that loaded highly on the same factor would also be significant, and vice versa. However, as one can see comparing the significant results with the factor analysis results in Table 2, this was not the case – for example, satisfaction with task was found to be significant, while other items loading highly on the positivity factor, such as involvement in group, were

Table 3 Descriptive statistics and inferential statistics of questionnaire responses following CMC and FTF focus groups ($n = 48$)

Question item	M [†]	SD	$t(47)^{\ddagger}$
1 How satisfied were you with the outcome of the discussion?			
Face-to-face	2.4	0.89	-2.29**
Computer-mediated	2.9	1.27	
2 How satisfied were you with this method of communicating with other members?			
Face-to-face	2.1	0.98	-3.87*
Computer-mediated	3.0	1.32	
3 How comfortable did you feel communicating with the other members?			
Face-to-face	2.2	1.09	-0.75
Computer-mediated	2.4	1.34	
4 How involved did you feel in the discussion?			
Face-to-face	2.1	0.94	-2.55**
Computer-mediated	2.7	1.38	
5 How inhibited did you feel participating in the discussion?			
Face-to-face	4.4	1.26	-0.68
Computer-mediated	4.5	1.40	
6 How vulnerable did you feel in giving your contributions?			
Face-to-face	4.0	1.62	-2.20**
Computer-mediated	4.6	1.58	
7 How easy was it to appreciate your group-mates' feelings?			
Face-to-face	1.9	0.79	-4.45*
Computer-mediated	2.9	1.34	
8 How focused were you on your contributions?			
Face-to-face	2.4	0.94	0.38
Computer-mediated	2.3	1.07	
9 How aware were you of the other group members' reactions to your contributions?			
Face-to-face	2.4	1.03	-2.55**
Computer-mediated	3.0	1.46	
10 How focused were you on the contributions made by the other group members?			
Face-to-face	2.1	0.86	-3.38*
Computer-mediated	2.5	0.90	
11 How easy was it to follow your group-mates' ideas?			
Face-to-face	1.9	0.90	-4.46*
Computer-mediated	2.9	1.39	
12 How much did you enjoy the experience of being in the group?			
Face-to-face	2.4	1.00	-0.89
Computer-mediated	2.5	1.27	

[†] Mean response to question 1 = 'not very', 6 = 'very'

[‡] Critical value of Bonferonni- t for 47 degrees of freedom and 12 comparisons at the 0.05 level = 3.01

* $p < 0.05$

** $p < 0.05$ before Bonferonni correction, non-significant after

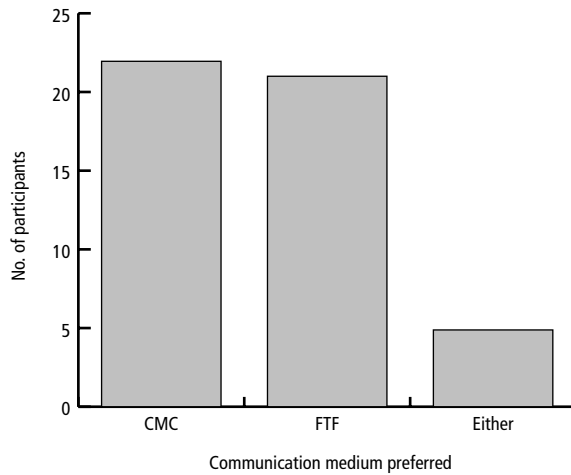


Figure 4 Number of participants preferring CMC, FTF or 'either' focus groups

not significant. This suggests that the questionnaire is more sensitive than factor analysis can detect, and that it does discriminate between items in each of the three factors identified. It suggests there are multiple underlying structures measured in the questionnaire.

Method preferred ...

Out of the 48 participants, 21 wrote that they would prefer FTF focus groups, 22 would prefer CMC, and five did not mind which media they used, responding 'either'. These results are depicted visually in Figure 4. A chi-square test found there was no significant effect of topic order on communication media preference $\chi^2(3, n = 48) = 2.02, p > 0.10$. However, there was a significant effect of communication mode order on communication media preference $\chi^2(3, n = 48) = 8.34, p = 0.01$.

From closer inspection of the chi-squared analysis, it can be seen that participants have a tendency to prefer the medium they experienced second. In the FTF followed by CMC focus group condition, 15 out of the 24 participants in the condition preferred CMC. In the CMC followed by FTF focus group condition, 12 out of 24 preferred FTF and seven preferred CMC; the remaining five had no preference. Interestingly, only the latter condition showed participants who stated 'either' as a response.

The other interesting thing about these results is that there were roughly equal numbers of participants preferring each medium for communication, despite the differences found in the preceding analysis, which shows that

the two media differ significantly on certain variables (satisfaction, number of agreements, and so on). This suggests that these things are not the mediating variables for preference.

... and why

In terms of reasons people gave for their preference of communication media, ten participants failed to give a reason, simply stating their preference, which was FTF for five of them, CMC for three participants, and either communication media for the remaining two. For the remaining 38 participants, a number of similar ideas arose for their reasons of preference. For the 20 participants who gave a reason for preferring CMC, typical reasons included:

I felt less intimidated and had more time to think about how I felt about the subject. I think people were more open because you were more anonymous.

Participant one in group one (participant 1:1)

So this participant is listing three main reasons for preferring CMC: first, less intimidation; second, more time to think about their feelings; and, finally, anonymity leading to openness. These are all key features of CMC mentioned in the Introduction. Feeling less inhibited and intimidated was a reason mentioned by four other participants. According to participant 2.3 this reduced inhibition is a good thing for all the participants as they can get a better understanding of each other's ideas. Similar to the idea of participant 1.1, of having more time to think about feelings in CMC, participant 6.2 wrote:

[In CMC] you can rehearse what you are saying and think concisely.

Two other participants mentioned that they felt people opened up more in CMC focus groups. In terms of anonymity, participant 4.3 saw this to be a benefit when discussing sensitive issues, and participant 4.1 saw CMC as 'less embarrassing'. CMC was also seen as being better than FTF as it was 'more enjoyable' and 'more fun'. Another line of reasoning for preferring CMC was given by participant 5.3:

[CMC] avoids awkwardness of not knowing people. It's easier to get away with comments on computer. [CMC] makes you less self-conscious. Doesn't matter the consequences of your comments.

This idea of the consequences not mattering was also picked up by participant 16.2:

[In CMC] you feel more free to discuss what you feel without consequence.

What participants meant by ‘consequences’ was not elaborated upon. They may be referring to the Reduced Social Cues (RSC) idea of depersonalisation – because of the lack of social context cues and the resulting anonymity, they cannot see the impact of their contributions and so, where normally in FTF their behaviour will be regulated by others’ behaviour, this does not occur in CMC.

Reasons for preferring FTF to CMC were mainly to do with communication flow. As mentioned in the Introduction, social context cues are important in regulating interaction and in monitoring the feedback on one’s contributions from others. Reducing these cues can disrupt communication flow, which can result in difficulty in following and understanding discussions (Kendon 1967, cited in Straus 1997). This is evidenced in participants’ responses – for example, participant 2.2:

[It’s] much easier to communicate with other people [FTF]. Conversation flows better when FTF.

Communication was reported to be more difficult to follow in CMC (participant 3.1), and easier in FTF focus groups (participant 12.2) as you only follow one idea at a time (participant 3.2). Participant 4.2 wrote:

[You] only follow one idea at a time [in FTF focus groups]. FTF [offers] more fluid debate. Often it’s hard to write a point down, but if verbally express point, can be easier. The internet lacked interaction; it felt at points like people were all answering different questions and going in different directions.

Similarly, participant 14.2:

[It’s] easier to follow discussion and react to people’s ideas [in FTF]. [In CMC it] takes a long time to type and by the time you’ve thought of something and typed it the discussion may have moved on.

Participant 13.1:

By typing it’s harder to build up flow of conversation and pick up comments over the internet. Internet was quite stilted and bitty.

Participant 14.3:

[In FTF you] can respond to people’s views quicker to agree or argue your point of view. [It’s] easier to follow what people are saying and [you] can interrupt quicker when talking as opposed to typing.

The idea of lack of interaction voiced in some of the above comments was picked up also by participant 10.2, with the comment:

[In FTF you're] more likely to bounce ideas off each other, whereas in computer-type group we tended to make just one comment to answer the question.

The time restraints of CMC was perceived to make it harder to expand on contributions (participant 11.3); this may also be a reason for the lack of interaction as participants are trying to get as many of their ideas down as they can.

Interestingly, participant 5.2 reported feeling more inhibited in CMC, 'with having to type quickly to keep up'. Likewise, participant 7.2 felt 'less able to contribute' because it took them 'longer to type' and so felt 'more involved and comfortable' in FTF. Participant 6.1 also found it 'easier to communicate' using FTF, which seems to be in relation to the idea that it is easier to talk than to type. So the effort required in typing seems to have affected some of the participants' preferences for communication media.

Some of these ideas may help explain why there is less socio-emotional group interaction. The cognitive effort required in keeping up with the discussion and the time demands resulting in having to type quickly may have prevented them from contributing socio-emotional acts.

Discussion

Summary and discussion of results

The purpose of this study was to compare FTF and CMC focus groups on process, objective and subjective measures to see if CMC is a worthy and beneficial alternative to FTF. The results support previous findings that CMC groups contribute less to a discussion than FTF in the same amount of time. In fact, this was still the case even though CMC groups had double the amount of time. This is almost inevitably to do with the extra time it takes to type than to talk. Nevertheless, despite the extra time and the lesser amount of total communication in CMC, there was no difference in the number of new ideas/answers generated, suggesting that although the CMC groups contributed less, what they did contribute was more useful for the discussion topic. In fact, when proportions were used instead of actual frequencies (to control for the significant difference in contributions) CMC groups contributed significantly more new ideas/answers than FTF groups, mirroring results found in decision-making tasks where some researchers have found there to be no difference

in the quality of decisions produced across the media despite FTF groups having more communication (e.g. Straus & McGrath 1994).

The results failed to support the hypothesis that within-group participation rates would be equalised in the CMC condition. This may be due to the nature of the tasks involved. In tasks previously compared, such as decision-making and judgment tasks, dominant participants may rise to perform the role of a group leader and keep the group focused on the task. In focus groups, however, the facilitator is playing this role, ensuring that participants' views get heard and stimulating discussion between the participants (Greenbaum 1998). This makes it harder for a participant to dominate the discussion and, indeed, for a participant not to say anything. Closer analysis of participation rates showed that they were not equal across members of the group, supporting Straus's (1997) conclusion that in fact CMC is not a method of obtaining equal participation but a way of making it *less unequal*.

Contrary to Straus's (1997) theory that the fewer words produced in CMC discussion present a ceiling effect preventing participants contributing as much as they could, it was found that although participants produced fewer words in CMC than FTF, there were no significant differences in the number of ideas they generated. This suggests that, because it takes longer to type than to talk, CMC promotes more concise communication than FTF (Hiltz *et al.* 1987), accounting for the fact that fewer words are generated.

There were significantly more solidarity, agreement and positive socio-emotional acts in FTF groups than CMC, mirroring the literature that has looked at these variables (e.g. Reid *et al.* 1996). However, in contrast to these past studies, there was no significant difference between the communication media in tension release – a rare occurrence in both media. This may be because groups took the task quite seriously and so did not 'joke around', or on the contrary there may have been no tension to release if all members felt comfortable in the situation. Also, contrary to predictions, and indeed the existing literature (e.g. Hiltz *et al.* 1987), there were no significant differences between the two media in negative socio-emotional acts (including disagreement), orientation or opinion questions. These all occurred less frequently than the other Bales act categories. Flaming was virtually non-existent in both media, adding to the growing literature stating that flaming is not as prevalent as once thought.

These deficits in CMC interaction process may be due to the *lack* of interaction. As mentioned in the qualitative questionnaire responses, there seemed to be a lack of interaction in CMC, it being more of a

‘question–answer’ session. In previous studies the tasks compared across the communication media have required interaction between the members to come to some sort of agreement; however, focus groups do not require agreement, and multiple views are encouraged. As a result they do not have to disagree with others’ ideas explicitly or ask others for reasons why they think as they do, or ask others’ opinions – that is, they do not really need to interact as much with one another as in other tasks. So although social context cues are filtered out in CMC, these cues may not be needed in this type of task. This may be why the lack of these interaction processes in CMC does not seem to affect the focus group outcome.

A key objective in focus groups is to facilitate the expression of individual feelings about a particular topic – lack of self-disclosure is often listed as a barrier to effective focus groups in conventional FTF settings. We predicted that there would be more self-disclosure in CMC due to the increase in private self-awareness and decrease in public self-awareness caused by the visual anonymity the medium provides, resulting in a greater tendency to reveal personal information. However, when the greater number of contributions by FTF groups were controlled for, the results indicated no evidence of a significant difference in total self-disclosure. When self-disclosure was broken down into positive, negative or neutral self-revelations, only the negative self-disclosure showed a significant difference between the two media, occurring more in FTF.⁴ These results may be due to the fact that, in order to increase self-disclosure in CMC, there needs to be an increase in private self-awareness and a decrease in public self-awareness – if both public and private self-awareness increase or decrease, then it is unlikely that self-disclosure will differ between the media (Joinson 2001).

The perception of anonymity and lowered feelings of accountability both contribute to lowered public self-awareness. However, in this study participants were accountable for their actions – they were identifiable by a participation number and already had, or were going to have, contact with the other members of their group at some point in the study. There was also the presence of the facilitator who had assigned them their participation numbers and so knew who they were. In a dispersed group, however, these conditions would not necessarily be present – the participant would be anonymous and may be able to sign in as their own alias, they would not have to meet up with the rest of the participants

⁴ However, it should be noted that instances of self-disclosure averaged less than 1 instance per participant.

face-to-face afterwards and probably would not know who they were to begin with. Future research should investigate whether these conditions would facilitate self-disclosure in CMC focus groups.

When proportions were used, CMC groups were asked more questions by the facilitator than FTF groups, suggesting that the CMC groups may have covered more questions of interest to the researcher. This is a tentative hypothesis as, to determine whether this is indeed the case, the transcripts need to be looked at again as some groups may have covered a particular question of interest without explicitly being asked to do so. Also, it may be that although FTF may have covered fewer areas, they covered them in more depth than CMC. This is an area for consideration in future research.

In terms of subjective experiences, it was found that participants were more satisfied with method of communicating, more appreciative of their group-mates' feelings, more focused on others' contributions and found it easier to follow others' ideas FTF than in CMC. Before the Bonferroni correction, participants were more satisfied with the outcome, felt more involved in the group, felt more vulnerable and more aware of others' reactions to their contributions in FTF than CMC focus groups. Contrary to the predictions that CMC groups would feel less inhibited, more comfortable and more focused on their own contributions, there were no significant differences in responses to these questions. Nor was there any evidence of a significant difference between CMC and FTF in enjoyment of being part of the group.

However, all responses to a particular question were on the same end of the scale for CMC and FTF focus groups – that is, towards very (1–3) or not very (4–6). So in terms of subjective experience, there were no major differences between CMC and FTF in that there were no bipolar responses (for example, participants felt *more* satisfied in FTF but they still felt satisfied in CMC).

When participants were asked which medium they would prefer to use for a focus group in future, 22 nominated CMC, 21 FTF, and five 'either'. This seems to indicate that, despite the differences in process and subjective measures between the media, preference for either CMC or FTF seems to be approximately 50:50. The fact that some participants said 'either' may indicate that they thought there was not much difference between the two media. This discrepancy between the process and subjective differences found, and participants' preferences may signify that these detected differences are too undetectable for people to notice – they may be below the level of normal public awareness. It is possible,

therefore, that responses to the question of preference are based on some other criteria (e.g. disliking typing).

The reasons given for preferences for CMC included anonymity, which allowed more openness of contributions, less inhibition and less intimidation. These are key features of the RSC approach to CMC and FTF communication differences. CMC was also seen as more fun and more enjoyable than FTF communication. FTF was preferred mainly for the easier communication this medium employs – it is easier to follow others' ideas as communication is *not* simultaneous, and reduced cues in CMC lead to a breakdown in communication flow. The effort required in typing and trying to keep up with the communication was another reason mentioned.

Limitations and directions for future research

Our experimental results suggest key strengths, as well as a few weaknesses, of CMC discussions, which we believe contribute to the debate among practitioners concerning the merits of online focus groups. It is clear that, in terms of sheer productivity of ideas, CMC has clear advantages, allowing participants to generate ideas faster and more efficiently online than FTF. It is true that the broader and perhaps deeper insights and levels of involvement that professional facilitators might expect to draw from conventional focus group discussions are harder to obtain online. Nevertheless, we could find few measures of group outcome, process or subjective evaluation on which CMC focus group discussions were systematically inferior to FTF discussions, and this alone argues in favour of greater use of the more cost-effective and convenient online medium.

Ours was an intentionally brief experimental study using simulated focus groups, but which methodically investigated these groups under controlled conditions. We have focused on a relatively narrow but significant range of measures, which we have studied in depth. We believe this is necessary to gain a better understanding of the basic processes that are taking place inside these groups, and to determine the essential building-blocks for further work. The next step would be to examine broader and more qualitative aspects of online focus groups as they are employed in the field – for example, the flow and content of conversation and the relevance of moderator experience, which other researchers have begun to tackle (e.g. Sweeney *et al.* 1997). Further work is also needed to

examine the more commercially oriented aspects of such groups (e.g. Bélisle *et al.* 2004).

In our CMC focus groups, participants were located in a single room, and although they could not see each other they could hear each other typing. This may inadvertently have caused a form of production blocking, where participants wait until they hear someone has finished typing before they start typing themselves. In distributed groups where the participants could be in different areas of the country, or even the world, this would not occur. To control for this possible effect, future research should place participants in more distributed locations.

There were several limitations relating to measures used. First, when using Bales' IPA, the unit for analysis was the whole contribution made by a participant. Some contributions may contain more than one instance of a certain act, but this level of analysis was insufficiently sensitive to this. Future research should dissect each contribution into smaller levels of analysis in order to obtain a more accurate analysis of group process. Also only verbal acts were analysed; an improvement on this study may entail coding non-verbal acts in FTF too, as these are an important form of group interaction.

Group size is a further limitation. In the present experiment only three volunteers participated in each group, considered to be the minimum group size for a focus group (Edmunds 1999). The benefits may be more noticeable in larger groups, as they suffer from more process losses as the size of the group increases and therefore may benefit more from the anonymity and simultaneous communication provided by CMC. Group size may have influenced the subjective measures (the lack of differences in vulnerability, comfort etc.) and one may assume that the larger the group the more vulnerable a person may feel, and so on.

A limitation frequently cited in the literature comparing these media is that it has been found that, initially, CMC hinders the performance of groups, but over time groups adapt successfully to the medium (Hollingshead 2001), so when grouping participants together in a laboratory with no previous history or future, the results may be misleading. However, these conditions are exactly that of a focus group, so the findings should generalise quite well.

This study employed reasonably emotionally neutral topics. The benefits of being anonymous may be more sizeable for more sensitive topics. This is an issue that may be considered in future studies, along with looking at focus groups of longer duration; in the present study they were quite short due to time limitations.

A final matter is that of 'lost' contributions. Participants may have failed to submit a typed response because it had been covered in the time taken to write it. This means that measures of amount of communication are not representative of all the contributions typed. This is a process loss of CMC, as the effort put in to typing a response is lost. Future research may consider filming participants during the CMC task to observe how they behave and to note the frequency of 'lost' contributions. Filming may also be useful to see the extent to which simultaneous communication actually occurs; video cameras could be set up at each computer and, by noting the times at which each contribution is typed, it would be possible to calculate how many participants are contributing at the same time.

Implications

These results have implications for how we account for the effects of CMC. Accounts that focus on the absence of social context cues in CMC cannot adequately explain some of our more significant findings. For example, focus groups are not required to reach consensus – there is little pressure on participants to agree or disagree with each other. As a result, participants may not feel the need to disagree with others as their views will also be heard, and one view is not necessarily better than another. If this is the case, and social context cues are not needed, then CMC is a good alternative to FTF focus groups.

This study potentially has implications for researchers using focus groups in all disciplines. Outcome measures and participants' subjective experiences lead to the conclusion that CMC focus groups seem to be a viable alternative to FTF. The downside of CMC focus groups is the extra time required to generate the same amount of ideas as in FTF: in the present study 20 minutes were required for CMC discussions to generate the same number of ideas as a ten-minute FTF discussion. However, this time limitation may be outweighed by practical difficulties of getting groups of participants together in a single location. There are virtually no time or location constraints on CMC focus groups and they can also be cheaper than FTF in terms of the costs they usually entail (travel and accommodation expenses, and so on). Researchers using focus groups should weigh up the advantages and disadvantages of using these different media in order to come to a conclusion as to which medium is best for their particular study.

Future research should explore the issues identified earlier, so a solid framework of evidence can be built up surrounding the use of CMC as a

potential alternative to FTF focus groups. Mediating variables for outcome, subjective measures and preference need to be investigated and pinned down to determine a theoretical framework to categorise and integrate research outcomes in this field.

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