Results

We finally got individual and group rankings from 16 trio groups (including 8 male groups and 8 female groups), as well as questionnaires. All questionnaire data were analyzed at the group level. After presenting the manipulation checks, we organized the findings around the three hypotheses presented above.

Manipulation checks

The questions in the questionnaire completed by participants at the end of the experiment help us test the manipulation of time pressure. Participants were asked to report how much they felt time pressure. There were five dimensions that “1” for the lowest time pressure and “5” for the highest time pressure. The table about comparison of group time pressures under different time limits is as follows:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 10 min | | | 15 min | | | No time limits | |
| male | 3.42 | 4.13 | 3.91 | 2.95 | 2.19 | 1.32 | 1.33 | 1.00 |
| female | 3.51 | 2.35 | 4.31 | 3.11 | 2.37 | 2.91 | 1.00 | 1.00 |

Table 3 Comparison of group time pressures under different time limits

As can be seen from the above table, participants under time-limited conditions did feel higher time pressure (M = 3.61) than participants who were under no time-limited conditions (M = 2.48), and the less time they were given, the greater the time pressure they felt. There was no difference between the male and female groups in the three conditions.

Participants were also asked how confident they were to convince others if there was no time limit from “1” (very little) to “5” (very much). Participants in high time pressure conditions showed greater confidence (M = 3.97) than those who were under low time pressure conditions (M = 3.33) and without time stress conditions (M=2.13) to convince other members in their groups.

Hypotheses testing

According to the AFM model, the outcome of a decision often depends on the content of the discussion (Karau and Kelly, 1997). Therefore, we present the findings related to hypotheses before the outcome of decisions.

*Hypothesis 1: Groupthink is more likely to happen under time pressure (leader, established procedure, confidence to find alternative solution)*

We judged whether a group in discussion process had a grouthink based on the five antecedents of Janis' groupthink model. First, after the discussion began, the researchers no longer intervened, so the group was free to discuss, which means the discussion process was completely isolated, and there was no interference from the outside world. Second, the questionnaire data showed that 83.33% (10/12) of the groups under time pressure reported that leaders emerged during the discussion, while only 50% (2/4) of the teams without time pressure claimed that the leader appeared. At the same time, three-quarters of the groups lacked effective rules or procedures to search and evaluate information during the discussion. We set up a question in the questionnaire that asked “To what extent do you think there is strong cohesion among your group members?” from “1” to “5” (“1” for the weakest cohesion and “5” for the strongest cohesion). Groups under time pressure reported significantly stronger cohesiveness (M = 3.91 for high time pressure groups; M = 3.53 for low time pressure groups) than groups without time stress (M = 2.87). The confidence that looking for alternatives in the antecedents of groupthink model does not a pply to the discussion used in this experiment. Therefore, we do not consider it as a standard. The above data supports Janis's antecedent theory, so we can think that groupthink is more likely to occur under time pressure conditions.

*Hypothesis 2: Groupthink leads to extreme risk taking because of the limited time.*

Janis suggested that one of the characteristics of groupthink is invulnerability, which leads groups to make more risky choices. In this experiment, we consider the option “trying to maximize the probability of being discovered, including signaling devices” as the most risky option. 66.67% (4/6) of the teams in high time pressure and 33.33% (2/6) of the groups in low time pressure conditions selected this option, while only 25% (1/4) who were in no time pressure conditions selected this option. At the same time, when asked “If there is no time limit (for example, you have time to rethink now), will you still stick to this choice?”, 69.44% of participants from the high time pressure group reported that they would not stick to the original choice, which means that time pressure contributes a lot to participants' choice of extreme risk decisions.

*Hypothesis 3: Groupthink leads to illusion of unanimity that some members have no time to convince others.*

Under time pressure, people often choose to retain their opinions because of the task priority or the pressure from peers (Janis, 1972), which creates the illusion that all group members reach consensus on the final result. This phenomenon also occurred in this experiment. The final question in the questionnaire is "Do you still have objections to the final order given by your team?". 69.44% (25/36) of the participants under time pressure reported that they still disagreed with the final ranking of their groups after the discussion. 52% (13/25) of the participants gave up their views because of time. In contrast, groups with no time pressure have significantly different answers on this issue. Only three of the 12 participants in no time limit condition were still dissatisfied with the team's final decision. This provides support for Hypothesis 3.

Group decision quality

The quality of decision - making performance of individuals and teams was revealed by their scores, and the scores were calculated by the difference between their ranking and expert ranking. The detailed calculation formula is as follows:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | High time pressure | | Low time pressure | | No time pressure | |
|  | Ave | Group | Ave | Group | Ave | Group |
| male | 78.67 | 78 | 80 | 80 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| female |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

Table 4 individual and group ranking score in different time pressure condition

The score calculated according to the above formula refers to the degree of deviation between individual or group decision and expert decision, which means the lower the score, the more accurate the decision.