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Laughter in Cooperative and Competitive Settings

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Abstract

This exploratory study investigates the extent to which social context influences the frequency of laughter. Fifty dyads of strangers played two simple laughter-inducing games. In a within-subjects design, we manipulated the setting in which the games were played. In the cooperative setting, the two participants worked together to earn money as a team and in the competitive setting, they competed against each other. We examined the frequency of laughs produced in cooperative and competitive settings. The analysis revealed a cross-over interaction between the setting and the type of the game that participants played. During a general knowledge quiz, participants tended to laugh more in the cooperative than in the competitive setting. However, the opposite was true when participants were asked to find a specific number of poker chips under time pressure. During this task participants laughed more in the competitive than in the cooperative setting. Together, the results highlight the flexibility of laughter as an interaction signal and illustrate the challenges of studying laughter in naturalistic settings.

Keywords: laughter, cooperation, competition, games

1. Introduction

Laughter is an extremely frequent social signal (Vettin and Todt, 2004), usually linked to amusement and humour (e.g., McKeown and Curran, 2015) but fulfills many other functions, ranging from turn-taking in conversation and speech coordination (Provine, 1993; Vettin and Todt, 2004) to signaling superiority and dominance (Kjeldgaard-Christiansen, 2018). The diversity of situations in which laughter is produced attests to its flexibility as an interaction signal.

Laughter also plays a pivotal role in promoting affiliation, developing cooperation, and regulating competitive behaviors (e.g., Bryant et al., 2016; Dunbar et al., 2021; Martin et al., 2017; Oveis et al., 2016). While laughter appears to be a key adaptive behavior facilitating social cohesion, little is understood about how laughter fulfills this function. We argue that laughter enhances social cohesion by virtue of its ambiguous nature, which allows its meaning to be determined by the social context in which it occurs.

The present study focuses on how social context influences laughter. Specifically, we compare laughter frequency in cooperative versus competitive contexts engineered to be as similar as possible, with the exception of inducing cooperation versus competition between participants. For this purpose, participants played two different laughter-inducing tasks: a general knowledge quiz and a game where participants had to find a specific number of poker chips under time pressure. Participants played both games twice: once in the cooperative setting, and once in the competitive setting. The study involved real-life monetary incentives, as subjects were led to believe that they would be paid depending on the outcome of each game. The analysis focused on examining the amount of laughter in the cooperative and the competitive context.

2. Method

2.1 Participants and Design

We recorded 50 dyads of participants (50 men, 50 women). Subjects were recruited from the general population via paper postings and were paid for their time.

The experiment followed a mixed design with the setting (cooperative vs. competitive) and type of task (general knowledge quiz vs. poker chip task) as within-subjects variables.

2.2 Stimuli

2.2.1 General Knowledge Quiz

Participants completed two general knowledge quizzes, one in the competitive setting, and the other in the cooperative setting. Each quiz involved 15 questions and was led by the experimenter playing the role of quizmaster. The experimenter read each question aloud and provided two response alternatives. Questions were selected to be challenging for participants, such that they were likely to hesitate before responding.

In the competitive quiz, participants were instructed to press a buzzer and submit their answers as quickly as possible. If their response was right, they received 1 point. If they were wrong, they received no points and the experimenter moved to the next question. The person who finished the quiz with more points won the round. Throughout the quiz, the experimenter attempted to keep participants' scores as close as possible, such that the outcome of the quiz remained uncertain until the end of the game. This was achieved by sometimes informing a respondent that their answer was wrong when, in fact, it was correct and vice versa. Questions were selected to be at a certain level of difficulty to enable this deception without detection.

In the cooperative quiz, participants worked together. After each question, they could discuss possible response options for up to 30 seconds before selecting the preferred response. They then pressed the buzzer and provided the final answer. If the answer was correct, the team received 1 point. In order to win the round, the team needed to finish the quiz with at least 10 points out of 15.

2.2.2 Poker Chip Task

Participants completed two versions of a task, in which they looked for poker chips in a large, opaque container filled with slime and containing 20 white chips, 10 red chips, and 10 blue chips. The container was closed and participants were asked to look for chips using the side

Figure 1: Participants during the poker chip task.

openings, such that the contents of the container remained invisible (see Figure 1). In the competitive setting, subjects were instructed to look for white chips. The person who found more chips within 2 minutes won the round. In the cooperative setting, participants worked as a team and had to find 10 red and 10 blue chips, also within 2 minutes. In both conditions, participants had to inform each other when they found any chips. They were also instructed to put every non-target chip (i.e., red or blue in the competitive condition, white in the cooperative condition) back in the box.

2.3 Procedure

Each session involved two same-gender individuals who did not know each other prior to the study. Upon arrival, participants provided informed consent and watched a 10-min video of silent comedy gags. Subjects were not recorded during this time and explicitly allowed to talk to each other. After watching the video, participants moved to the study area and sat facing each other at the table. Their faces and upper bodies were filmed with two webcams (Logitech HD Pro Webcam C920) and two microphones (HV577L Pro Headworn) connected to a MOTU 4Pre Audio interface recorded high-quality sound.

Participants played the two games in both competitive and cooperative contexts. The order of these settings was counterbalanced across dyads. Thus, each session involved playing four games. Participants were instructed that, depending on their performance, each of them could earn up to £2.50 for each game. Ostensibly, each person could be paid up to £10 for the entire study session. This reward was represented by stacks of poker chips that the experimenter increased or decreased depending on the outcome of each round. For games played in the competitive setting, only one participant could win the round and earn £2.50. For games played in the cooperative setting, both participants could win the round as a team and earn £2.50 each. The general knowledge quiz was always the first game that participants played, and was followed by the poker chip task, presented in the same (cooperative or competitive) setting. After that, a short break followed and participants watched another silent comedy video for 5 minutes. They then moved back to the studio room and were recorded during the second quiz and the poker chip task. Following each task, participants completed a short scale reporting how competitive they felt towards their partner and how much they thought they worked together. At the end of the study subjects were debriefed and every participant was paid £10 for their time.

2.4 Measures and Analytic Strategy

Recordings were annotated by four observers, two of them certified FACS coders. Observers annotated laughs for each of the four games. The annotations served to compute an indicator of laughs per minute, which was analyzed as a function of setting (cooperative vs. competitive) and task (general knowledge quiz vs. poker chip task). Given that the distribution of laughs per minute was strongly positively skewed, we transformed this measure using a cube root transformation.

3. Results

An examination of participants' perceptions of the extent to which they felt they worked together with their partner and how much they felt competitive towards this other person revealed a pattern of responses supporting the validity of our cooperative and competitive settings.

We used a linear mixed model with a by-participant random intercept (Barr et al., 2013; Bates et al., 2015; Magezi, 2015) to regress the cube root-transformed number of laughs per minute on setting (cooperative vs. competitive), task (general knowledge quiz vs. poker chip task), and their interaction.

Although the main effects of setting and task were significant, $B = 0.08$, $t(282.34) = 2.70$, $p = .01$ and $B = 0.10$, $t(281.62) = 3.29$, $p = .001$, respectively, they were qualified by a significant interaction, $B = -0.19$, $t(281.78) = -4.28$, $p < .001$, see Figure 2.

We therefore examined the effects of cooperative vs. competitive setting separately for the general knowledge quiz and for the poker chips task. This analysis revealed significant simple effects. Specifically, for the general knowledge quiz, the number of laughs per minute was higher in the cooperative ($M = 1.59$, $SD = 1.14$, non-transformed) than in the competitive condition ($M = 1.26$, $SD = 1.04$), $t(282) = 2.70$, $p = .01$. The opposite was true for the poker chip task – here, participants laughed more in the competitive ($M = 1.68$, $SD = 1.47$) than in the cooperative setting ($M = 1.25$, $SD = 1.06$), $t(283) = 3.34$, $p = .001$.

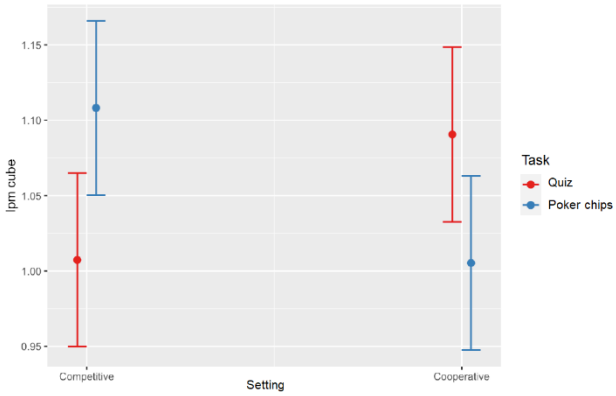

Figure 2: Effects of setting and task on number of laughs per minute

4. Discussion

In the current study, we predicted that participants would laugh more frequently in a cooperative setting than in a competitive setting. The analyses did not support this hypothesis. Instead of a general influence of cooperative versus competitive contexts, our findings suggest that the frequency of laughter is strongly affected by the type of

task in which participants engage. In a general knowledge quiz, participants laughed more in the cooperative setting, while during a poker chips game it was the competitive setting that elicited more laughter.

Future analyses of this dataset will focus on the mechanisms underlying these task-specific effects. One potential explanation of the present finding are the structural differences between the two games. The poker chips task was played during 2 minutes, and the general knowledge quiz lasted longer, up to approximately 15 minutes. In addition, since in the cooperative setting participants could discuss possible response options, quiz sessions tended to last longer than in the competitive setting. Although analyzing the number of laughs per minute controls for the differences in the duration of different games, it is possible that interactions between participants varied as a function of task duration. It is also worth noting that the poker chips task involved just the two participants of similar status, while the general knowledge quiz was led by the experimenter, thus being a 3-person interaction which could be marked by a different power dynamic. Finally, the general knowledge quiz would have been a familiar task to most participants; the poker chip task, on the other hand, would have been an unfamiliar task. The poker chip task required dyads to place a hand in a box of slime, with the potential for their hands to come into contact. It is possible that the higher occurrence of laughter in the competitive setting compared to the cooperative setting was a result of participants using laughter to mask any social awkwardness they were experiencing—this assumes greater levels of social awkwardness in competititve settings compared to cooperative settings. These proposed explanations for the observed interaction are, of course, speculative and will require further investigation.

The next steps of the present work will involve annotation and analysis of the amount of speech across the four games as a measure of participants' engagement. Examining laughter synchrony could provide further insights into how this signal contributes to building rapport and social cohesion. Overall, given that the mere frequency of laughter is a very general measure, pairing laughs with meaningful observable signals, such as speech, specific game events, or potentially even facial movements, could provide more specific insights into the meaning of laughter in different tasks and settings.

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