Trying to Be Heard: Gender and Group Dynamics

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Abstract

We use nonlinguistic audio analysis to investigate differences in speaking style of men and women in study groups discussions. Our results show that women took shorter turns than men and that women interrupted men more than men interrupted women. We found no significant differences in other turn taking characteristics.

Keywords: Gender · Group dynamics · Wearable sensors · Nonlinguistic audio analysis.

Introduction

Group gender composition plays an essential role in social interaction and group dynamics [15, 7], making it one of the foundations of research on gender inequality [1] and gender difference [18]. Many sociology studies have reported explicit relationships between gender and conversational behaviors, including turn-taking behaviors and interruption patterns [8, 19, 2, 5]. For example, studies found that women take shorter speaking turns [9], and that men are more likely to interrupt women than the opposite [17]. Onnela et al. showed that women were more talkative in natural collaborative context, but found no difference in gender in team project context [6].

In this study, we investigate differences in gender speaking styles using non-linguistic audio collected using Rhythm Badges [3, 4] from study groups meetings in an executive MBA program. In part, this study was motivated by concerns raised by women students who generally had the impression that they did not get to speak as much as men.

The differences we find in turn-taking characteristics only partially confirm previous laboratory experiments, and the differences in interruption patterns contradict existing research. These results contribute to a limited, but growing, body of literature that investigates gender differences in natural settings. In particular, to the best of our knowledge, it is the first time differences in interruption patterns have been validated outside the laboratory.

Data

- 2016 from the first four weeks of a full-time executive MBA program for mid-career professionals
- A total of 22 teams comprising 105 students chose to participate in the study, out of a total of 112 students in the cohort. This included 33 females and 72 males.
- All participants gave written consent to participate.
- The participants were from 35 different countries and had an average age of 37.41 ± 4.45 years (mean ± standard deviation), as well as an average work experience of 13.78 ± 4.24 years. A total of 363 meetings with a total duration of over 500 hours were recorded during the experiment.
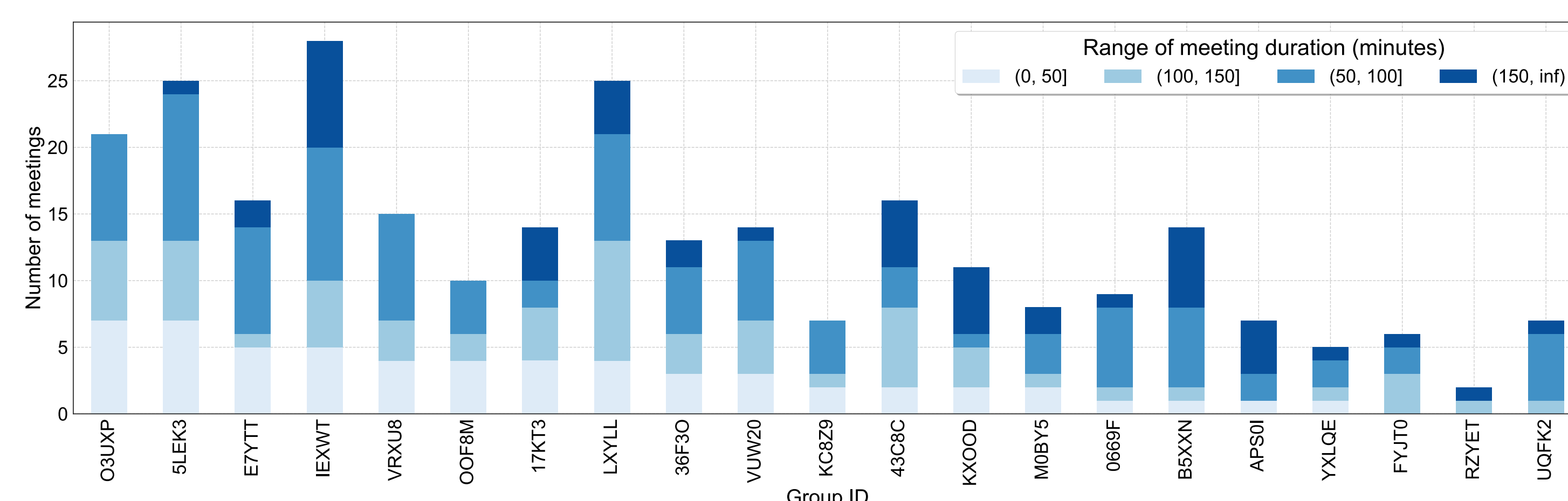

Figure 1. Meeting frequency and duration of selected groups

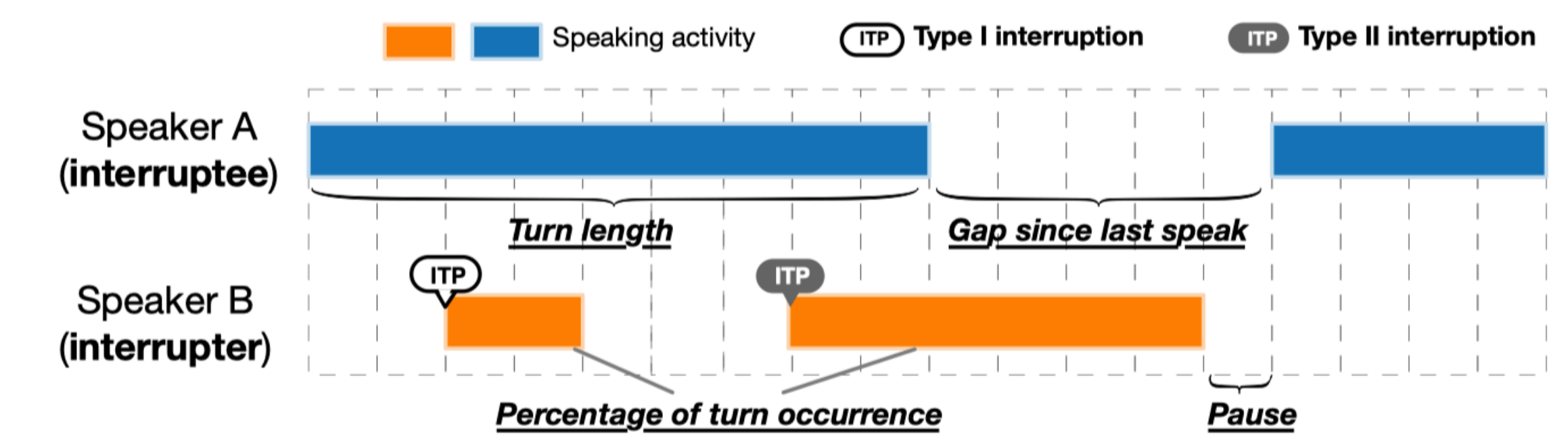## Results

Turn-taking features

Fig 2. Illustration of conversational features. Underlined bold text represents turn-taking features, the other bold text represents interruption features.

- Turn-taking features include turn length the percentage of turn occurrence (how frequently a person speaks), pause between consecutive turns, and gap since last turn to speak.
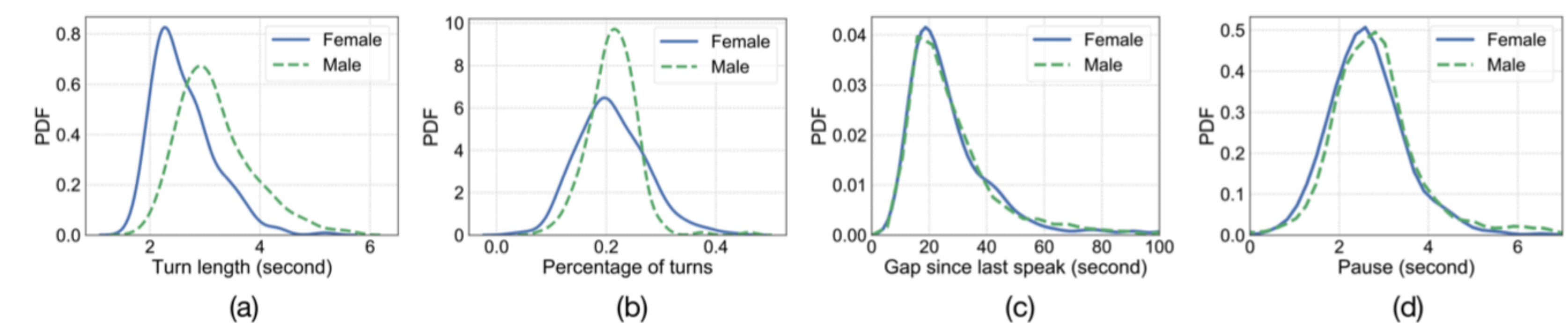

Fig 3. Analysis of turn-taking features. (a) ~ (d) show PDFs of different features.

Interruption features

$$\text{Interruption ratios} \quad \begin{array}{c|c} FF & FM \\ \hline MF & MM \end{array} = \begin{array}{c|c} \dfrac{\mathbf{I}_{FF}}{\mathbf{I}_F \cdot \mathbf{N}_F} & \dfrac{\mathbf{I}_{FM}}{\mathbf{I}_F \cdot \mathbf{N}_M} \\ \hline \dfrac{\mathbf{I}_{MF}}{\mathbf{I}_M \cdot \mathbf{N}_F} & \dfrac{\mathbf{I}_{MM}}{\mathbf{I}_M \cdot \mathbf{N}_M} \end{array}$$

$\mathbf{I}_{FF}$: Number of FF interruption
$\mathbf{I}_F$: Number interruption started by females
$\mathbf{N}_F$: Number of females in group

- ***Who interrupts whom***: In a mixed-gender group meeting, there are four classes of interruption, namely FM (female interrupts male), MF, MM, and FF. Given the fact that the numbers of both genders are different, we calculate interruption ratios as shown in the matrix above.
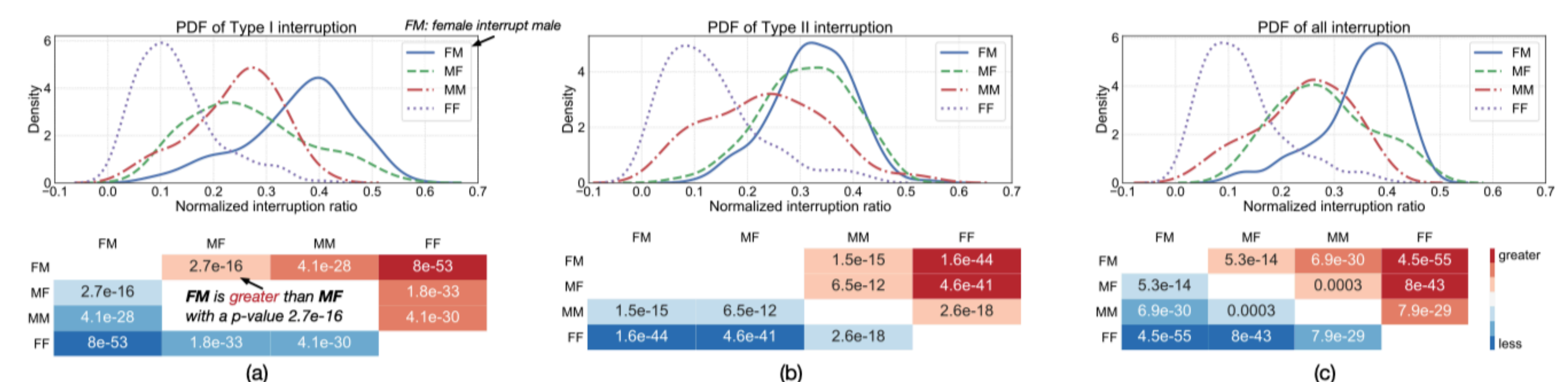

Fig4. Analysis of who interrupts whom with PDFs of four-class interruption and results of Mann-Whitney U test for different types of interruption. (a) Type I interruption; (b) Type II interruption; (c) Type I and Type II interruption.

- ***Interrupter:*** The role of gender to interrupters is analyzed in Figure 5. We show PDFs of male and female interrupters under three different types of interruption. We find that females are more likely to initiate interruptions, especially Type I interruption.
- ***Interruptee:*** Similar to the analysis of interrupters, we also analyze interruptees. The results in Figure 6 indicate males are far more likely to be interrupted.
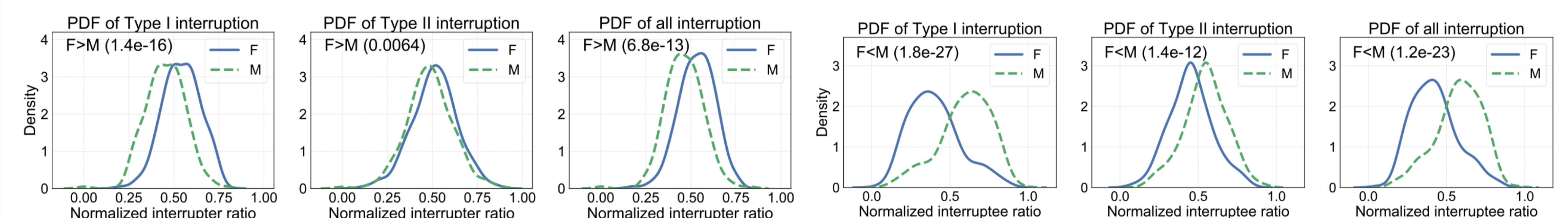

Fig 5. Analysis of interrupter under three types of interruption.   Fig 6. Analysis of interruptee under three types of interruption.