

BACKGROUND

Flow

- Flow state*: a feeling of deep mental absorption and enjoyment in an active, goal-driven task.
- Mihaly Csikszentmihaly** (1975, 1990): flow arises from tasks that are optimally challenging, goal-driven and that produce continual feedback, and it results in experiential "outcomes":

1. Challenge-skill balance
2. Clear goals
3. Unambiguous feedback
4. Concentration
5. Action-awareness merging
6. Sense of control
7. Loss of self-consciousness
8. Time distortion
9. Autotelic experience

"antecedents"
(preconditions)

"outcomes"
(subjective
experience)

- Early research did not distinguish between *solitary* and *group tasks*, though both can produce flow (e.g., playing music alone, or with others).

Group flow

- Acting in concert with others in the pursuit of shared goals often gives rise to enjoyable and absorbing flow-like experiences, driven by *social interaction*.
- Group flow* theories import the flow concept to social contexts: optimal engagement with an interactive task can produce a *mode of flow that occurs at the group level*.
- Despite increasing interest, little empirical work has accompanied the growing set of theories and definitions (Pels et al., 2018):

Sawyer (2006, 2015): group flow is an *emergent property of group interaction*, involving 10 experiential components.

Gaggioli et al. (2011, 2017): *networked flow* as a six-stage process (meeting (co-creation of a shared frame, perceiving similarities, arriving at collective intentions, balanced group action, creation of novel artifact, application of artifact in social network).

Pels et al. (2022, 2025): balanced group action, experienced as a perfect fit between the behaviour, state of mind and skills of the group members, and the perfect handling of the group task by the group system.

Hackert et al. (2022) build a taxonomy that distinguishes group flow from other forms (e.g., shared interactive (individual) flow) based on *interactional synchrony* and *complete self-other overlap*

Musical group flow

Unique task constraints of ensemble music performance justify considering it in isolation from other contexts (e.g., conversational problem-solving, team sports, surgical teams, etc.):

- Hinges on millisecond-level sensorimotor coupling (unlike turn-taking in group conversations)
- Requires real-time mutual prediction and adaptation, often without explicit hierarchical structure
- Group's goal (e.g., unified creative expression) is often not explicit or pre-determined (unlike team sports)

Aims

1. Characterize the commonalities across first-person accounts of musical group flow experiences (flow "outcomes")
2. Develop a set of data-driven, domain-specific survey items designed to assess group flow in music ensemble performance.
3. Use underlying factor structure to reduce dimensionality and inform theory-building

1. QUALITATIVE DATA

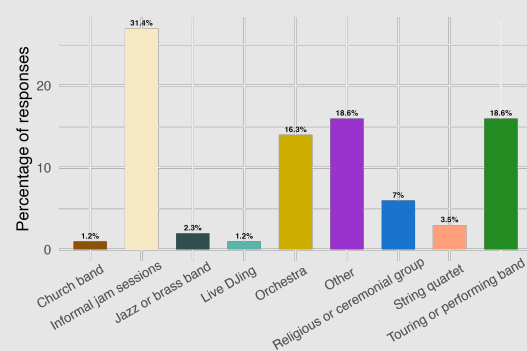
Methods

87 musicians from 16 countries

- 42 female, 42 male, 3 other
- Mean age 31.7 years (SD = 14.1)
- At least one year of experience
- Regularly engaging with at least one ensemble
- 26% professional musicians
- 14% experience with non-western music



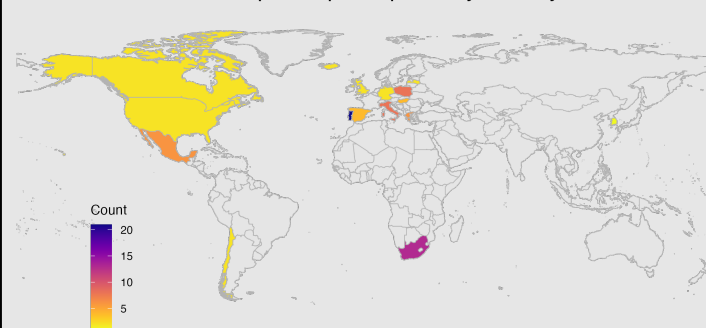
"Choose a group performance context which you engage in regularly":



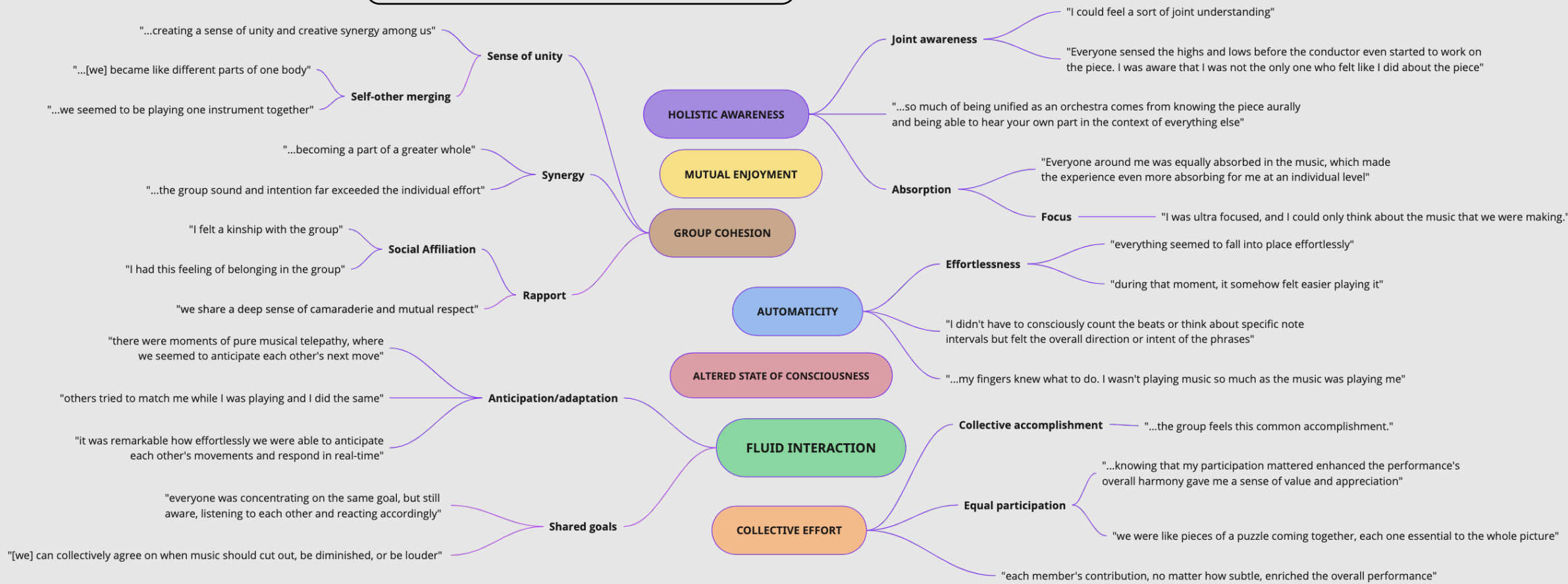
Instructed to recall a (specific) highly engaging and enjoyable instance, and describe in detailed free-from written responses to four questions:

1. What did you experience?
2. How did you feel towards group members?
3. What stood out the most?

Free response participants by country



Thematic Analysis



2. Survey item development

65 items developed based on the seven major themes extracted from thematic analysis

3. ITEM RESPONSE DATA

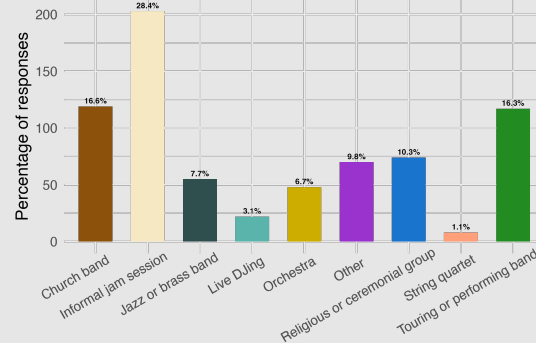
Methods

717 musicians from 29 countries

- 229 female, 480 male, 8 other
- Mean age 35.3 years (SD = 12.4)
- Mean 5.3 years of experience (SD = 3.2)



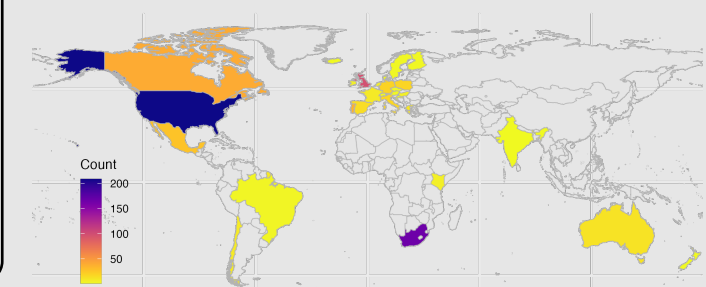
"Recall your *most recent* session of playing music with others that lasted at least one hour..."



Respond to survey items on a seven-point Likert scale



Survey participants by country



Exploratory factor analysis with

- ≥ 0.4 communality
- ≤ 0.15 cross-loading margin

produced **three-factor model of group flow**:

Mutual enjoyment & autotelic experience

Item	Factor 1	Factor 2	Factor 3	Communality	Complexity	Uniqueness
The experience was extremely rewarding.	0.88	-0.05	0.01	0.73	1.01	0.27
I loved the feeling of playing and would like to capture that feeling again.	0.87	-0.06	-0.05	0.58	1.03	0.42
I sense that my fellow musicians were enjoying the performance as much as I was.	0.74	0.07	0.16	0.59	1.24	0.41
The experience was extremely enjoyable.	0.71	-0.14	0.04	0.67	1.24	0.33
I felt great about what we were accomplishing together during the performance.	0.61	0.03	0.10	0.58	1.08	0.42
The experience filled me with excitement.	0.60	-0.02	0.12	0.51	1.09	0.49
There was a mutual sense of exhilaration shared among all the group members.	0.58	0.17	-0.12	0.51	1.39	0.49

Automaticity

Item	Factor 1	Factor 2	Factor 3	Communality	Complexity	Uniqueness
I felt perfectly "in-tune" with everyone else.	0.01	-0.01	0.81	0.64	1.00	0.36
I noticed that we could match each other easily.	0.03	-0.04	0.71	0.50	1.01	0.50
As a group, we became like one whole rather than individual parts.	0.08	0.04	0.70	0.57	1.04	0.43
Our interaction was completely fluid.	-0.05	0.10	0.63	0.47	1.07	0.53
Our interaction felt easy and natural.	0.13	0.03	0.60	0.57	1.12	0.43

Fluid interaction & group cohesion

References

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