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Article:

Timmers, R. orcid.org/0000-0002-1981-0834, Tzanaki, P. and Christensen, J. orcid.org/0000-0002-5373-5532 (2023) Coordinating actions as active agents in a dynamic musical environment: Comment on “Musical engagement as a duet of tight synchrony and loose interpretability” by Tal-Chen Rabinowitch. *Physics of Life Reviews*, 47. pp. 104-107. ISSN 1571-0645

<https://doi.org/10.1016/j.plrev.2023.09.020>

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Coordinating actions as active agents in a dynamic musical environment: Comment on “Musical engagement as a duet of tight synchrony and loose interpretability” by Tal-Chen Rabinowitch

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Citation:

Timmers, R., Tzanaki, P., Christensen, J. (2023). Coordinating actions as active agents in a dynamic musical environment: Comment on "Musical engagement as a duet of tight synchrony and loose interpretability" by Tal-Chen Rabinowitch. *Physics of Life Review*, 47, 104-107. doi: 10.1016/j.plrev.2023.09.020.

An increasing repertoire of experimental studies is providing evidence for links between synchronised actions, as is often the case in music-making contexts, and experiences of social connectedness and sharing of a social identity with others involved in the music-making process. The literature review and proposal of a tight-loose framework by Rabinowitch [1] is timely and effective in consolidating findings as robustly evidenced whilst also identifying specific issues that require further research. The main point of discussion relates to the primary focus of existing research on the social effects of joint musical engagement (in particular, synchronised action within those engagements), which are most often conceptualised as having positive social outcomes. Rabinowitch notes that positive outcomes associated with increased group identification also include the risk of negative consequences of out-group exclusion, reduction in critical engagements with opinions and standpoints, and uncritical adoption of the group consensus. In many instances, shared music-making seems to present limited negative outcomes, with her proposal suggesting that this limitation may come from a balancing of requirements for tightness with opportunities for looseness. The tightness would be specifically related to the tight synchronisation of actions, whilst the looseness can come from other attributes associated with music and its context, including floating intentionality of meanings attributed to musical sounds [2], as well as the creativity and playfulness in musical structures as is often the case in improvised music.

In this commentary, we welcome the contribution offered by the review of existing literature and the proposed tight-loose framework for tolerant group membership (TGM). We outline several considerations needed to further nuance the proposed framework. These relate to the modalities and properties of musical synchronisation, acknowledging the embodied context of music-making and the need to consider who is making music and their perspectives and expectations. We take a stance against the implicit arguments that the “cause and effects are in the music”, arguing that music-making should always be considered as a situated embodied experience, where an acting person in a context is central, avoiding the implications that certain musical structures lead to certain outcomes. Before that is discussed, we first make a note about the process of synchronisation.

Modality and properties of musical synchronisation

Interpersonal synchronisation is broadly defined in terms of “continuous temporal alignment of participants...through a broad and varied spectrum of movements and activities” [1, p.123]. Indeed, the paper has summarised evidence for a variety of synchronised interactions (walking, clapping, swinging) to have comparable positive outcomes of common group membership (CGM) or social connectedness. However, further distinctions are necessary to adequately uncover the mechanisms or processes by which this is possible. For example, is coordinated movement central to the outcome, can tight

coordination happen without synchronisation, and are the effects the same for auditory and movement modalities? An examination of the reviewed studies uncovers additional nuances that warrant consideration: Certain studies confine interpersonal synchrony to in-phase coordinated movements, considering complementary types of behaviour as non-synchronous [3, 4]. Conversely, other studies view antiphase movements as a form of interpersonal coordination, exhibiting similar effects to in-phase synchrony [5]. In a recent mixed-methods study [6], we found that participants' experience of synchrony was dependent on the modality of presentation. When interacting with auditory stimuli, participants tended to be more judgmental towards their partners' asynchrony, whereas merely watching the interactions allowed individuals to be more flexible and receptive to varying degrees of synchrony. On the other hand, anti-phase synchrony was perceived to be as enjoyable as in-phase synchrony when participants were actively interacting with a partner in the auditory modality, but this was not observed when individuals were merely watching antiphase movements. These findings indicate a fluidity in what can count as synchrony as well as the relevance of modality in shaping expectations.

Embodied experiences of acting agents

Central to Rabinowitch's proposal is that tightness and looseness can be combined in most musical interactions and that this balance will give rise to a TGM that is open rather than closed. The basis for this prediction is an analogue with societies that "more *tightly enforce* norms" versus those that exhibit "greater acceptance of norm violations" [1, p.127]. No direct evidence is offered, however, to support looseness and tightness coexisting, and that within this dynamic, it is tightness in interaction that gives rise to strong CGM and looseness that shaves off the edges and makes group membership more tolerant. Indeed, this is something open for future testing. A number of insightful examples of ways in which musical interaction can be seen as open-ended or normative are provided, with predictions focusing on testing the relationship between 1) tight synchronisation, 2) tight synchronisation plus contextual looseness or 3) tight-loose characteristics in musical interactions and their contexts on CGM versus TGM.

The tight-loose framework is a thought-provoking proposal that is already leading to an enhancement of how relationships between synchronisation and social bonding can be considered. The fundamental issue that arises, however, is the implied causality that certain musical structures lead to certain social outcomes. Are not attitudes, norms, and social contexts primary in shaping ideas about group membership, and are not musical structures created and engaged with from within these frameworks? Do computer-generated tight rhythms as in many popular music genres imply less openness than music expressively performed by a musician? Is loose timing, such as in free improvised music, also not surrounded by implicit norms and etiquette?

The strength of the proposal is its ability to consider elements that give a strong sense of unity, group membership and working towards a shared goal whilst also considering elements where openness is created. Fluid borders in group inclusion, for example, can foster openness: a choir can expand or shrink depending on people's availability, an orchestra integrates various groupings, and a soloist may feature and then rejoin the group. Engaging in these embodied experiences presented in a particular context seems key, which cannot be reduced to the causal effects of specific musical patterns in and of themselves. We instead argue that group effects of any musical engagement exist within the interface between person and music as conceived within a certain context, and that these are difficult to and should not be separated out. Musical tightness is a consequence of musical structures conceived in certain ways, rather than purely a property of the music itself. Similarly, the openness of music, such as its floating intentionality, may be questioned by people outside of a tradition, who find it difficult to

grasp such intentionality. For instance, in the mid to late twentieth century, many Western composers were either focused on constructing highly controlled musical systems or on giving up compositional control to chance. Although this struggle has been interpreted as a conflict between complete control and complete freedom, recent research instead suggests that these opposing perspectives share an ideology of limited self-abnegation, either handing over control to mathematical systems or natural constraints [7, 8]. In this example, tight and loose extremes offer a similarly limited role for agentic experience, which in turn may not yet predict the performers' or listeners' experiences well. Similarly, context does not exist without relationality to a person, which could significantly influence aspects of normative inclusion or exclusion [9]. Therefore, normative fluidity is evident in how musical engagement is enacted.

Influence of the context *and* the person

Whilst Prediction 1 focuses on the contribution of the pattern of musical interaction to group membership, Prediction 2 adds the element of context. It proposes that the loose elements of the musical context, combined with the tightness required for synchrony, allow for a more tolerant group membership that alleviates the negative effects of synchrony. However, as argued above, context alone is not sufficient to account for variations in the reception of musical interactions. Attributions related to the people involved are important as well. Personality traits and social viewpoints have been shown to impact how synchrony is experienced [10]. For instance, trait empathy has been found to facilitate the skills required to attain synchrony [11], also influencing the intensity of social bonding experienced following synchronous interactions [6, 12]. A neuroimaging study [13] revealed that participants' tendency to attribute the cause of life events to either internal or external factors (referred to as internal and external locus of control, respectively) influences the degree of temporal adaptation to a partner's movements. Moreover, acknowledging that a partner made an effort to synchronise despite personal characteristics that restricted them from performing well was found to enhance social bonding, even when synchrony was not achieved [6]. These findings emphasise the important role of individuals' characteristics and perceptions in joint interactions that might influence the outcomes predicted by the tight-loose framework. For example, music's looseness could introduce a level of unpredictability, prompting individuals with an external locus of control to adapt further to their partner's musical performance at the expense of their own timing [10], bearing the risk of greater conformity. It is crucial, therefore, to assess the potential impact of these "person-centred" factors and their interaction with the context when examining the role of music in promoting more tolerant group dynamics. While the author acknowledges these factors on page 129 [1], we propose their inclusion as significant dimensions of the framework's predictions.

Finally, there are a variety of other contextual factors that can influence the level of CGM felt [14], which could complicate empirically evaluating a tightness-looseness framework. When participants are misaligned with one another on what their collective goals are, their feelings of joint agency can decrease [15]. Similarly, people had stronger feelings of togetherness with their partner when they synchronised their actions to play musical duets rather than single-pitch musical sequences [16], suggested to be related to the richness of their shared goals. Also, when an individual's contributions to and rewards from a collective goal were more balanced, it increased their sense of collective agency [17], with cooperative actions often also reducing their sense of individual agency [18]. In musical improvisation, group size impacted how strongly people identified as a collective subject [19], with larger groups feeling more dependent on each other's actions and less able to individually influence the overall musical direction. Stephens [20] suggested that feelings of collective group membership in a large choir were also continually changing, ebbing and flowing in response to their contact with the

changing structure of the music over time. All of these contextual elements could be seen to influence CGM without affecting synchrony tightness when examining tolerant group dynamics.

Conclusion

We agree that seeing musical engagement as a locus for a tightness-looseness framework offers a promising direction for future research. For instance, there is a lot of strength in the tightness-looseness framework when considering the clinical benefits of music. Through history, musical education has frequently been overly focused on identifying musically talented individuals rather than developing inclusive and encouraging musical environments. Presenting musical engagement as a celebration of musical talent and virtuosity as genius while threatening to exclude other less 'gifted' individuals from this process from a young age leads to a form of tightness tinged with a competitive feel [21, 22]. This competitiveness, when combined with an aim towards a finished artistic product over individual experiences, leaves little room to accommodate or support those with weaknesses. Going against these limitations, many amateur musical groups are now defining themselves as inclusive musical groups, such as dementia choirs, musical groups for autistic children, or children with hearing impairment, and are showing health and well-being benefits for their members [9, 23, 24, 25, 26]. In these groups, there is a focus on stronger members supporting those who may have weaknesses, which leads to an increased sense of belonging and equality. This supportive and looser approach still often has a focus on making something together, but it also includes the added components of fluid borders and additional support structures that strive towards everyone's flourishing [27, 28].

What we may need to acknowledge is that the musical structure in itself does not determine the outcomes of the musical interaction. Instead, musical structure is realised through an active agent interacting with others in a particular context, which includes questions on how synchrony is perceived or defined. This interaction between individual, group, context and musical materials is responsible for social and emotional outcomes, where affordances of musical materials vary and may direct outcomes to a degree. Additionally, tightness and looseness may indeed contribute to group dynamics, but many other factors can mediate their effects, and at times, they could also be proxies for other variables that are more central to this experience. For example, tightness may imply ease of predictability and lack of interference or disruption, whilst looseness may imply ease of participation and integration. Furthermore, out-group rejection may be limited in contexts where group boundaries are loosely defined: groups already consist of a diversity of people and can expand or reduce flexibly. Finally, it may be important for the experience of TGM that participants feel as agentic actors, and that this remains with the expansion of the group.

Acknowledgments

This commentary was made possible with University of Sheffield, PhD scholarship funding supporting PT, and UKRI funding, Grant Number MR/T040580/1 supporting JC.

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