EACIS

Emergent Affective Configuration of Identities in Space

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Abstract. This presentation explores how individuals expect social identities to be arranged in space relative to each other in the absence of specific information and when individuals must rely on affective meanings provided by language cultures to form impressions of others. To this end, we will present our model and discuss various implementations informed by social psychological principles.

Keywords: agent-based modelling, affect control theory, affective meanings, Affective Judgment in Spatial Context.

1 Introduction

Imagine a room with a boring person, a malingerer, a scientist, and an architect. Who do you expect to approach whom? You might intuitively expect the boring person and the malingerer to talk to each other, and the scientist to interact with the architect. This spatial organization in the room reflects our hypothesis. Since individuals strive to avoid cognitive [1] and affective [2,3] dissonance, social identities are expected to organize themselves in space according to the affective meanings that the shared affective culture ascribes to them.

This conference contribution is a preliminary attempt to develop a formal model, called EACIS – "Emergent Affective Configuration of Identities in Space", for predicting and exploring how social identities are culturally expected to organize in space according to their affective meanings as measured by Evaluation-Potency-Activity (EPA) ratings [4, 5]. We address the deeper social psychological mechanisms that drive the affective perception of identities in space by integrating Affect Control Theory [3, 6] with Affective Judgment in Spatial Context (AJ-space) [7, 8, 9] in an agent-based model. Using a generative approach [10], we will inform the model with ACT ratings provided by French (n = 700) and German (n = 700) participants and test it against empirical data provided by a different pool of n = 276 participants who

completed an online experimental task. In this way, we will compare different "rules" against experimental data.

2 Theoretical background

Especially when specific information is lacking, individuals rely on affective information (i.e., connotations) provided by language cultures to make sense of and organize social identities, groups, and their interactions [4, 5]. These affective meanings are fundamental to the formation of social impressions and expectations [11, 2, 12]. Affect control theory posits that (1) individuals strive to avoid dissonance and maintain their basic feelings [2, 3] and that (2) because affective meanings are largely shared, they allow people to engage in smooth interactions consistent with cultural norms without much cognitive effort [13, 14]. Thus, affective processes informed by culturally specific affective meanings shape impression formation processes that determine expectations about behavioral choices and actor labeling [12, 13, 6]. In addition, (3) affective meanings captured by EPA ratings can inform computational models that can reliably predict outcomes of the impression formation process [15, 6].

Similar to the formation of impressions about social events [2, 3], the formation of impressions about how individuals are organized in space requires not only a cognitive map of the environment to localize individuals [16, 17], but also an affective map that registers which individuals to approach or avoid [7]. Individuals tend to (1) have similar evaluations (e.g., positive attitudes toward two close friends) of objects that belong to the same mental unit, and (2) form mental units from objects that are close in physical space [18]. Thus, people should expect close objects to have rather similar affective meanings, whereas they should expect distant objects to have rather dissimilar affective meanings. Some preliminary evidence supports this assumption [7]. Reversing this assumption, we hypothesize that people should expect identities to organize in space according to their affective meanings.

However, AJ-space as well as previous research also suggests that the process of impression formation in the context of physical space does not simply correspond to Euclidean distances in affective space as measured by EPA ratings. For example, a limited number of affectively salient identities may dominate people's affective representation of the entire space: affective judgments in spatial contexts are influenced by affective hotspots that carry enough weight to serve as anchors for evaluating the environment [7]. In this way, hotspots can induce an affective polarization of the environment, creating peaks of repulsion nearby and basins of attraction farther away.

3 Study design

Building on this theoretical background, our study aims to develop an agent-based model of affective impressions in physical space, informed by (1) affective ratings provided along the EPA dimensions, and (2) empirical data on the organization of identities in space. Using a generative approach, we will explore the results of different "rules" [19, 20] and compare them to patterns found in the empirical data. We will

also explore how cultural differentiation may affect the model and whether it corresponds to the variance we found in the empirical data.

3.1 EPA Survey

A representative sample of the French (n = 700) and German (n = 700) populations was asked to rate 387 (194 male and 193 female) identities organized into 10 word sets of approximately 35 to 40 items along the EPA dimensions. By averaging the participants' ratings, we obtained the out-of-context affective meanings [3, 13]. The results of the survey have been discussed in detail elsewhere [21] and will provide the EPA ratings for the social identities we used in the model.

3.2 Experiment

In an online experiment, N = 276 French participants were asked to place eight social identities in a way that they would intuitively expect. Each participant performs this task 4 times with different sets of eight identities (for details see OSF pre-registration: https://osf.io/zfkda). The data provided by the participants (how they actually expect social identities to organize in space) will be compared with the results of the model.

3.3 ABM Model

In the following, we provide a brief overview of the model. The purpose of the model is to reproduce how individuals expect agents to organize themselves in space, based on culturally defined affective meanings captured by the EPA dimensions. In our model, agents represent social identities, each of which has three variables corresponding to their ratings on the EPA dimensions and two variables storing coordinates in space. The process overview can be illustrated as follows: agents are initiated at random locations in space; at each time step, a specific cognitive procedure is activated to define where the agent will position itself. Since the cognitive procedures express distances that agents wish to have to other agents, agents face a geometric optimization problem that is solved by the Nelder-Mead algorithm [22]. The algorithm was adapted to find the position in space that best matches the given distances to the other identities and minimizes the total distance between the initial position and the final position. Thus, agents will move to the closest position that satisfies the desired distances.

As part of the conference presentation, we will present results from several “rules”. (1) a "full information model" will observe results when agents calculate the distance between themselves and all other agents in the model; (2) two "bounded rationality models" will explore patterns that arise when agents consider only a limited amount of available information, such as (2.1) adjusting their position only in relation to the closest agents ("local optimum model"), or (2.2) orienting themselves only to salient agents as defined by maximum and minimum affective distances ("hotspots model"). Furthermore, while members of language cultures are essentially consistent in the affective meanings they assign to social concepts, subtle differences have been found

[13, 23, 24, 20]. Therefore, a "cultural differentiation model" will explore what happens when distances are calculated not over average EPA ratings, but over values drawn randomly from the distribution determined by the ratings provided by survey respondents.

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