The Problem with Bullying: Lessons Learned from Modelling Marginalization with Diverse Stakeholders

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Abstract. While building a simulation model to gain insights on bullying interventions, we encountered challenging issues that forced us to reconsider our modelling concepts. We learned lessons about the need for quality assurance and a more demanding construction process when building models that aim to support decision making. One of the lessons is that even academically accepted concepts such as "bullying" can be ambiguous. Experts and interested parties do not agree about how to define and use the term bullying. Indeed, before we can model "bullying", we need a shared understanding of its meaning. Otherwise, insights from the model could be misinterpreted and lead to misleading conclusions. Concepts are inherently imprecise and contain grey areas. Although this may be true, not all of them are ambiguous. For the scope of this paper, ambiguity implies that the same word is used to point to different concepts. For different reasons, bullying has evolved to point to different concepts for different people and sometimes even for the same person. We propose to solve these challenges by identifying which concrete bullying behaviors to target, and by focusing on simulation models for interventions addressing those behaviors.

Keywords: Bullying, Social simulation, Formalization, Interventions, Agent-Based Modeling

1 Introduction

There are several reasons why social simulation appears to be a promising tool for research on (and the facilitation of) conflict resolution. First, the formalization of theories and causal claims about a conflict within a computational model themselves help to clarify the tangible issues surrounding the conflict and to foster dialogue about possible ways of resolving it [1]. Moreover, a single computational architecture for an "artificial society" can integrate multiple disciplinary perspectives, which is crucial when dealing with complex interpersonal or inter-group conflicts [2]. Finally, insights from simulation experiments

can inform debates among stakeholders and policy-relevant decisions in the real world [3].

At the beginning of this project, we viewed bullying as a complex type of social conflict that would benefit from a social simulation approach. A simulation model of bullying would improve existing intervention programs and proposed solutions, which so far have had mixed results [4,5,6]. The topic of bullying has been researched by multiple disciplines such as criminology, psychology, sociology etc. In a telling comment about the state of bullying research, one of the keynote speakers at the Anti-Bullying Forum expressed the opinion that there is no theory of bullying. We believed that a social simulation of "bullying" could help to integrate the different points of view, enable intervention testing, provide reasons and solutions for inconsistent outcomes, and contribute to a robust theory of bullying.

Based on these premises, we set out to create a model of bullying. Our model did turn out to be useful, but our efforts with various stakeholders to improve the model led to some important lessons. In Section 2, we describe our methodology to create a bullying model. We present the results of our efforts in Section 3 and discuss them in Section 4. From there, we propose a solution in Section 4.3 and conclude in Section 5.

2 Methodology

The goal of the planned methodology was to achieve the construction of a simulation model of bullying for interventions. More specifically the aim of the model was to understand the emergence of bullying and to test which interventions would be successful in preventing this emergence. The purpose can be classified as explanatory [7] insofar as we were trying to figure out both the causal architectures of bullying and to determine the reasons behind mixed outcomes in established intervention programs. However, we can also describe the model's purpose as exploratory in the sense that it attempts to provide a deeper understanding of the target system [8] and a deeper exposition of theories [7] around the concept of bullying.

Our plan was to first capture the important dynamics and then add components to the model so that we can map the intervention mechanisms. To begin with, the construction of a social model is typically the work of an interdisciplinary team [9]. A social model of bullying needs a bigger network of collaborators because it requires more perspectives due to the nature of the subject. Moreover, bullying behaviors are considered a complex issue [10]. The construction of complex models is comprised of multiple steps. With each step, the model is extended and becomes more and more complex. Finally, the explanatory character of the model alongside the prospect of supporting decision making means that our model needs to meet better quality standards. To meet the quality requirements, to address the complexity, and to account for the lack of bullying expertise in our team, we designed a methodology that drew on the

principles of the agile programming approach: "iteration" and "flexibility" [11]. We planned the following steps:

The first step was to conduct initial literature search, operationalise bullying, and select the model focus. The second step was the construction of a working simulation model of bullying to act as a starting point, a minimum viable product (MVP) to initiate the feedback sessions. The third step is the presentation of the first version to subject matter experts for feedback. Next, we planned to correct and expand the first model. The fifth step was the presentation of the second model version to subject matter experts for feedback and request data for validation (where possible). The process was to be repeated until a satisfactory level of agreement and model capacity was reached. The final step was the validation of the model using interviews. The goal was to use the model to understand the impact of interventions. All in all, our planned input was: literature search, feedback sessions with experts, and interviews. The input methods were to be used as supplements, where needed, throughout the model construction process.

3 Results

In this section, we summarize the results of the model construction process. First, we explain the modelling choices for the first version of the bullying model. Then, we present the feedback we received from our first session with stakeholders. Finally, we display our findings from the intensive literature search and interviews regarding the bullying concept.

3.1 First modelling choices

We chose to focus on university bullying due to our context. Currently, there are two dominant definitions of bullying corresponding to different paradigms [12]. The oldest one, introduced by Olweus, which we will call the "Olweus definition" defines bullying as the "negative actions" of one or multiple persons towards one person, "repeated" over time, when the actor/s and the receptor of the behavior have "asymmetric power relationship" [13]. To build our first model version, we selected a recently evolved definition, which we will call "Schott and Søndergaard definition", that views bullying as "... an intensification of the processes of marginalisation that occur in the context of the dynamics of inclusion/exclusion, which shape groups. Bullying happens when physical, social, or symbolic exclusion becomes extreme, regardless of whether such exclusion is experienced and/or intended." [12]. The second definition reflects a new paradigm on viewing bullying that puts more focus on the social dynamics component. This choice was the outcome of discussions with our main bullying subject matter expert.

We decided we would use the agent-based approach for our simulation model as it allows the observation of emergent phenomena. This approach organises the subject matter knowledge around three main components: agents, attributes

(environment, agent, general), and behaviors (including events). Such an approach is very close to the modes of thought of interventionists and adapts well to the needs of the jurisdictional system. Drawn from the selected bullying definition, the behavior we chose to model is the exclusion of university students from dyadic interactions, and negative experiences in dyadic interactions during leisure time at the university. We considered a student to be bullied when the percentage of negative interactions and exclusion experiences to overall interactions is high.

3.2 Diverse Feedback

To invite feedback from subject matter experts, we presented our work at the Anti-Bullying Forum [14]. We enquired whether our first version seemed intuitive and what additions we would need to make to proceed with a more intuitive model. The model presentation was in the form of a poster with a simplified explanation of how the model works as well as discussions stemming from the poster presentation. Most of the participants at the Anti-Bullying Forum were not familiar with computer modelling.

Bullying experts and practitioners reserved a neutral attitude towards the first model version during the feedback sessions. They did not seem triggered negatively by our model with its agent characteristics and rules, but they did not endorse it either. An exception was our selected definition, which raised some questions due to the conflict among the different paradigms. Our primary goal during our interactions with conference participants was to invite their suggestions for improvement based on their individual understandings and research agenda.

The input we received was very diverse, a fact that might not be so surprising since bullying experts come from such diverse disciplinary backgrounds. Each recommendation translated into one or more model variables, and one or more agent behaviors. Our initial model included 23 parameters, some of which are mathematical with the potential to contain up to 100 elements. Table 1 presents the input we received divided in 5 categories.

3.3 Reflection on the modelling process and further literature research

The next step after the Anti-Bullying Forum was the correction and extension of the bullying model, which proved a challenging task. Gaining a distance from the modelling process and moving to a period of reflection enabled us to acknowledge this difficulty and to distinguish it from the usual challenges of the modelling process. Our challenge was to select the aspect which would be added to the next model version. The diversity of the feedback shows that bullying researchers hold different views on what is considered crucial in determining bullying behaviors. This realisation is intensified by the fact that we received feedback from a limited amount of people. Upon attendance of different sessions at the Anti-Bullying Forum , we discovered even more perspectives that might be included in our

Table 1. Input grouped in categories

Personality	Psychological Needs	Personal skills	Contex	Social
Personal tendency to isolate Resistance to belonging Aggressiveness	General acceptance Acceptance from friends Belonging	Self-efficacy Sociometric status and perceived popularity Numb Blindness Connection and disconnection from self and others Questioning personal perception Social and Emotional Learning Filtering information Goal setting	Friendship networks Teacher as agents	Social capital Social impact Social influence Peer influence Social Norms Effect of role models Effect of leaders

model. To make the most of the reflection process, we decided to supplement our input with additional literature searches. The next subsections present our findings.

Different understandings of bullying Except for the different academic definitions and thus understandings of what bullying is [12], we found out that perceptions of bullying differ between academics and non-academics. In some studies [10,15], researchers have noticed that views of what constitutes bullying did not coincide with the dominant definition at the time (the Olweus definition). To be more specific, in the study with teachers [10], teachers did not consider parts of the definitions important to classify a behavior as bullying and one teacher changed what she considered bullying after hearing the definition from the researchers. In addition, in the study mentioned in [15], students changed their answers in a bullying survey after being given the definition. Interestingly enough, teachers did not judge the characteristics of the behavior itself to evaluate whether an observed behavior is bullying, but also factors such as a student's fitness to be called a victim, their judgement on whether the student "deserved" the behavior, the "normalcy" of the behavior, and the student perception (as suggested by the second paradigm) [10]. The study mentioned in [16] also showed that the emotional effect of the behavior on the student at the receiving end of it counted as a factor for whether other students classified the behavior as bullying.

Measuring Bullying One way to assess bullying is by using surveys. Cornell and Bandyopadhyay [17] point out that some surveys employ definitions to

clarify what they mean by bullying while others use simpler versions of one of the definitions, which include ambiguous elements. Furthermore, the Juvenile Victimization Questionnaire avoided definitions altogether and asked 2 questions for the categories "bullying" and "teasing and emotional bullying". The categories were specified with the behaviors "chasing, grabbing hair or clothes, making you do something you did not want to" for the bullying category, and "feeling bad or scared because of calling names, saying mean things, or saying they did not want you around" for teasing or emotional bullying. The Olweus Bully/Victim Questionnaire (referring to the cited version [18]) uses the combination of definitions and behavior lists to achieve concept clarification. It includes more behavior categories than the Juvenile Victimization Questionnaire, such as intentional exclusion from a group of friends. In addition, they present more behavior examples including the general description of "other hurtful things like that", which is open to interpretation. As the questionnaire proceeds, it introduces the Olweus definition to restrict what counts as bullying and adds a note that says not to include playful teasing and behaviors that are not repetitive or behaviors between individuals without power imbalance. Apart from surveys that ask people whether they have been bullied, there are surveys that ask others to nominate who has been bullied [17]. These surveys seem to operate under the same methods of concept clarification.

Another method to measure bullying instances are naturalistic observations. In one example, observers counted as bullying the "aggressive events" in which there is a power relationship between the aggressor and the receiver of the aggressive behavior [19]. Finally, apart from the survey based interviews or interviews that followed surveys [17], researchers have utilized interviews to explore bullying. It is not clear how interviewers measure bullying. In study [20], the authors mention that they based their assessment on the description of experiences but do not refer to whether they exposed interviewees to their perceptions of bullying definitions or examples of bullying behaviors. Similarly, in study [21], the authors mention the fact that they asked parents and children whether their children or they themselves had been bullied but the authors do not explicitly state whether they provided definitions or examples of bullying behaviors to interviewees to understand their perception of bullying.

Evolution of the bullying concept It turns out that "bullying" evolved into an umbrella concept that accommodates various and quite diverse behaviors [22]. According to Schott and Søndergaard [12], the concept history tracks to the term "mobbing", understood as the attack on one person by a group of people. Later, with the help of the media, the term bullying started to convey behaviors with varying intensity and effect. Cohen et al. give the examples of non physical behaviors such as social exclusion, criminal behaviors such as predatory sex crimes, mutual teasing, and rough-housing to account behaviors that were given the label of bullying. At the same time, they mention that the concepts of "bully" and "victim" changed in such a way that most children can be categorized as either the former or the later [22]. Possibly connected to the evolving character of

the bullying concept, researchers have discovered perceptual differences between different stakeholders and researchers when it comes to what is categorized as bullying [10,16,23,24].

Informal Interviews We conducted interviews to further investigate the concept of bullying. We discussed bullying with several colleagues to test the variance even within one institution, namely, our university. The University of Agder has established a report system that is visible immediately when one visits the main university website [25]. The link for the report system contains information about how to use the system alongside information about bullying. However, it does not list the behaviors that fall into the category of "bullying".

We chose to interview colleagues from different departments, in different positions (organisational or research related), and in various levels of decision making regarding bullying issues. We asked them to describe what bullying constitutes for them, to point to specific behaviors and whether the behavior we had included in our model was registered under the bullying concept from their perspective. Most of our interviewees faced difficulty when trying to identify bullying behaviors. Interestingly enough, considering the small number of interviewees, they did not agree on whether the behavior we modelled in our model was a bullying behavior. The hypothesis that there is a shared understanding of the bullying concept at our university was falsified.

4 Discussion

From Section 3.3, we can extract the following:

- Academics and non academics do not agree oh what is important to define bullying. In general, people have diverse views on what criteria to use to define a behavior as bullying.
- The categorization of bullying in practice does not involve only the assessment of the action itself but subjective factors such as the effect on the "victim", how much the observant likes the "victim" etc. This might explain why one observed behavior might be interpreted differently by different observants.
- Bullying is evolving to include more and more behaviors. Nevertheless, we cannot be certain that everyone has the same access to the new aspects of the concept.

The disagreement on characterization criteria, the subjectiveness in evaluation, the inclusion of more and more behaviors, and the different access to the concept evolution make the concept of bullying unmanageable. In this section, we start by explaining the issues behind modelling "bullying" based on our findings. We then continue with the evaluation of the different ways we talk about bullying, characterized by different abstraction levels in our mission for a modelling alternative.

4.1 Expectations behind modelling concepts

Before we go into the analysis we should refer to concept fuzziness and ambiguity. Concept imprecision or fuzziness implies that there are grey zones. When encountered with a grey zone, we are not sure whether the concept can be applied to describe our observation. A "fuzzy" concept is something that cannot be avoided. Concerns over concept fuzziness have been addressed before such as in the case of the social model "The Status-Arena" and the concept of "Rough and Tumble" [26]. In essence, modelling helps with concept precision since it exposes aspects of each concept ontology. Term ambiguity implies that a term is used to describe two different concepts. An example is the term "crane", used to describe a type of bird or a machine. Apart from the distinction between fuzzy concepts and ambiguous terms, there is the moral judgement of an observed action. Due to the subjective nature of morality, moral judgements of the same observation vary.

We can hypothesize the following scenario: bullying starts by the meaning of "all against one physical violence". This might have been a manageable use of the concept but then, the media extend the meaning of the term. In search of an explanation for deeply shocking events, such as student suicides and mass shootings [22], journalists tie more behaviors to the term. Researchers contribute to the trend by adding more dimensions to bullying with the development of definitions. Depending on individual media access and other sources, people develop the concept differently. On a collective level, bullying points to different concept of actions ranging in intensity, context etc. It is very easy to identify "crane" as an ambiguous term since the two concepts involved do not have any similarities. It is much harder to identify bullying as ambiguous since the concepts involved are all interactions of some kind. We believe that a more accurate characterization of bullying is to say that it is a moral judgement. You will rarely hear someone endorsing "bullying" behaviors (maybe only in cases of intended revenge). We propose that the term developed to basically include negatively judged behaviors in interactions among people. This explains why teachers and students evaluate the effect of the behavior on the "victim", and the personality of the "victim" to assess whether a behavior is bullying. It is because these factors affect their moral sensitivities. Such a term is very useful to assist the Anti-Bullying movement. While this is perfectly in line with the progress of a social movement, it is not helpful when it comes to being a modelling concept of actions.

To successfully use an explanatory model of bullying, it is very crucial to agree on what actions constitutes bullying. Without a shared understanding it is not possible for interested stakeholders, including decision makers, to know how and where model insights apply. However, the state of the term "bullying" and the status of model communication methods cannot promise clarity over what is modelled and what is not. Model communication is a set of techniques, such as model documentation, to help us illustrate what the model does and what it includes. Nevertheless, in practice, even if documentation is available, model specifics are not always understood [27]. Consequently, model documentation is

not the best way to clarify our definition of bullying to people without modelling experience, such as bullying experts. They will typically assume that we follow their definition. In the following sections we try to identify an alternative to the use of the term of bullying for modelling purposes.

4.2 Exploration of alternatives

In Figure 1, we have mapped different items related to the word bullying and ordered them by their abstraction level in an effort to find an alternative modelling content. Lower level of abstraction means that the item is more closely connected to the object, in this case the observed action.

The first items correspond to the different definitions given by researchers. Different definitions point to different concepts. For example, the behavior we used in our first version model [28], would be categorized as bullying using the Schott and Søndergaard definition but would not under Olweus. Definitions are still unfit to serve as a modelling content as non academics do not use their elements to categorize behaviors as bullying. Consequently, were we to employ definitions, we would face issues with validating our models as measurements do not typically include observations from academics. In addition, it would still be hard to communicate clearly insights and limitations of the model to interested stakeholders.

Bullying modes are on a similar level of abstraction as definitions. Bullying modes specify behaviors by limiting them in a specific context. For example, physical bullying needs to include physical behaviors. Bullying modes are still ambiguous since they inherit the same properties as the term bullying in a more specified context.

When we move on to the level of behaviors, we notice that it is easier to distinguish among different behaviors. For example, it is easy to say which behavior is a "name-calling" behavior and which is "hitting". Modelling behaviors might imply that we depart from the term bullying since not all behaviors are unanimously categorized as bullying. In addition, as with the Rough and Tumble, we may still face grey areas and confusions over judgement. Nevertheless it is much clearer to distinguish between two types of behaviors and thus for theories and explanations to emerge.

4.3 Proposed solution

We argue that the solution is to model concrete behaviors. A model of "hitting" or "name-calling" gives less space for speculation and does not introduce uncertainty about the results. Even though there is less confusion of what the model includes, these behaviors are still complex in nature. Some anticipated implications of following the proposed solution are:

- The feedback from literature and experts used in the model construction process will be more straightforward.

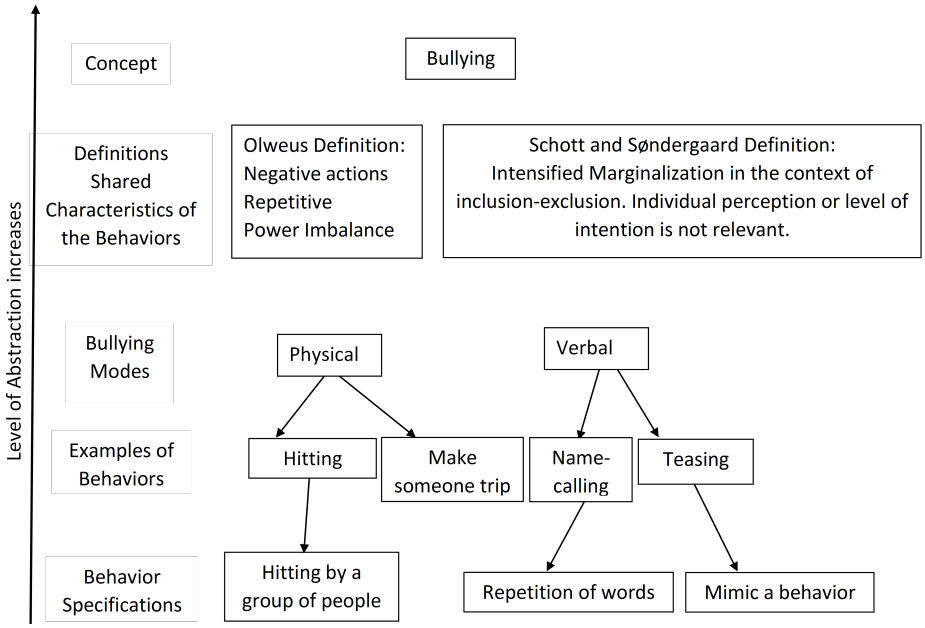

Fig. 1. Bullying at Different Levels of Abstraction

- Stakeholders will be forced to clarify what are the issues they need to solve instead of mentioning abstract notions such as "bullying".
- Stakeholders can readily apply insights from models without worries of misinterpretations.
- Multiple models will need to be used in combination to achieve the resolution of a variety of behaviors.
- On the negative side, we expect less people to be interested in these models since bullying has become a catching phrase.

5 Conclusions and Word of Warning

The feedback we received from stakeholders on our explanatory model of bullying led us into a deeper investigation of the concept using literature search and interviews. We found out that bullying is evolving and expanding, matches more than one concepts, and fits better the form of a moral judgement than an action concept. The ambiguity of the term leads to inconsistent measurements. Considering the term "bullying" as a moral judgement might explain why there is a big range of understandings of what bullying is, and why factors such as the relationship between observer and behavior recipient, and the result of the behavior, play a role in characterizing the behavior as "bullying".

Bullying definitions and bullying modes are less abstract ways to talk about the same issues. Nevertheless, even on this level of abstraction, we face similar

discrepancies. We propose to model concrete behaviors and to move away from "bullying" so as to avoid misunderstandings regarding model usage. The conclusion is intensified by the low level of model communication. More work needs to be done to identify possible implications of using concepts of concrete behaviors to test for interventions.

Our study concerns bullying, but the same issues appear whenever concepts are not only fuzzy, but ambiguous. The bullying community does not seem to be aware of the issue and the simulation community has not established procedures to assess the fitness of concepts. We encourage modellers to consider whether their modelled concepts might raise similar issues as the ones we faced. In that case, we suggest the further specification of models that target specific behaviors and we encourage modellers to avoid ambiguity that hinders theoretical clarity and successful practical interventions.

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