



# Beyond a checklist for acceptance: understanding the dynamic process of community acceptance

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## Abstract

Community acceptance is considered a prerequisite for successful energy transitions and the uptake of renewable energy technologies (RET). While policy and research often focus on acceptance as an outcome, the process of acceptance remains a black box, especially in uncontested RET implementation contexts. We study the dynamic process of community acceptance where (1) different actor groups can have (2) different roles and (3) different active and passive responses towards (4) different objects of acceptance within the RET project implementation. Results show that community acceptance occurs over time and goes beyond citizen or resident acceptance alone. By unpacking different dimensions of acceptance, we show that even in uncontested cases, acceptance is ambiguous and includes various responses toward various objects. Furthermore, we see that roles can influence and interact dynamically with responses and that preferences for roles are heterogeneous. To move beyond acceptance as a merely coincidental outcome, but a widely embraced and intentional process, this process should meet the participatory needs of different actors.

**Keywords** Community acceptance · Social acceptance · Renewable energy technologies · Participation · Energy transition

## Introduction

Climate change and its severe consequences for humanity call for urgent system change. Against this background, The Netherlands has committed to go from a fossil-based energy system towards a renewable energy-based system (Rijksoverheid 2019). One theme that gets explicit policy attention is the societal acceptance of the energy transition in general, and of renewable energy technology (RET) projects more specifically (Rijksoverheid 2019). For example, the regional energy strategies, part of the Dutch regional implementation plans for the energy transition, emphasize

the significance of acceptance for executing energy transition plans and projects (NPRES 2021).

This focus on acceptance in the policy domain is strongly linked to the idea of overcoming community-level opposition and implementation delays, for example, through public engagement by which acceptance is to be achieved. Less interest and attention are being paid to the underlying dynamics of acceptance. This outcome-oriented focus contrasts with recent literature promoting a more critical approach to social acceptance as a process (Wolsink 2018; Batel and Rudolph 2021).

Nevertheless, a lot has been written about social acceptance in the context of this outcome-oriented realm. Literature reveals that lack of public acceptance can indeed hinder achieving renewable energy innovation and related infrastructures. Hence, public acceptance is seen as one of the conditions for successful energy transitions (Wüstenhagen et al. 2007; Devine-Wright 2017; Chilvers et al. 2018). Particularly, the failure or delay of RET implementation is mainly discussed against the backdrop of local community opposition. Indeed, examples where non-acceptance led to delays or even cancellations of renewable energy innovations are plentiful (Aitken et al. 2008; Devine-Wright 2011) and

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suggest that the community level is the level where gaining acceptance seems the most problematic.

Early scholarly work moved from NIMBY (not in my backyard) explanations toward understanding the socio-psychological and context-specific factors influencing community opposition (Batel 2020). Notably, a substantial portion of community acceptance research has been focused on identifying factors that explain acceptance as an outcome rather than a process.

While seeking explanations for community acceptance, it is notable that research into community acceptance of local RET implementation rarely focuses on discrete uncontested cases. Acceptance research is predominantly based on large-scale surveys of people's opinions about hypothetical project plans for RET, or on discrete cases with outspoken opposition (Devine-Wright 2007). Commonly, factors such as timely information and participation are considered important for influencing acceptance (Petrova 2013; Whitmarsh et al. 2019), but pinpointing universal explanations for community acceptance remains challenging as most work is based on individual hypothetical acceptance case studies and outspoken opposition cases alone (Ellis and Ferraro 2016; de Wildt et al. 2021).

Recent academic discussions advocating a process-oriented approach to acceptance (Wolsink 2018; Batel and Rudolph 2021) raise questions about potential differences in how acceptance is understood compared to this outcome-focused policy approach, particularly in uncontested RET implementation. What is missing is a deeper understanding of how acceptance of local RET plans and projects comes about, especially within a context that can be considered successful administratively.

This paper addresses this gap by answering the question: How does community acceptance come about in RET projects? We aim to provide a better understanding of community acceptance in two ways. First, we move away from studying acceptance as an outcome. Instead, we follow the approach suggested by Aitken (2010), Batel et al. (2013), and Huijts et al. (2019), and study acceptance as a process over time in the context of local RET implementation. We analyze the processes of RET project implementation, the actors involved in shaping the project, and those affected by it. We specifically study how different elements (actors, roles, responses, and objects) interrelate in the dynamic process of acceptance. Second, we provide an empirical counterbalance to the existing literature by examining discrete RET projects that have been successfully implemented without formally articulated opposition. Conceptualizing and understanding the process of acceptance will not only bring more conceptual nuance and clarity to the acceptance debate, but it is also pivotal to identify leverage points for policy and citizens to influence the energy transition.

The paper proceeds as follows. "Theoretical background community acceptance" will unpack the notion of community acceptance, and factors identified in the literature as important for acceptance. "Methodology" discusses the methods used for this research. "Results" provides the results of an empirical study of uncontested and implemented RET projects. "Discussion" presents the discussion followed by the conclusion in "Conclusion".

## Theoretical background community acceptance

We see community acceptance as the acceptance process of a specific RET project implementation by local stakeholders. Based on literature research,<sup>1</sup> we identify four different dimensions of the process of community acceptance: the actors involved (who), the roles of these actors, the objects of acceptance (what), and the various responses (how).

### Actors and roles

Community acceptance is a facet of social acceptance (Wüstenhagen et al. 2007). According to Wüstenhagen et al. (2007), social acceptance consists of three interdependent facets: community acceptance, socio-political acceptance, and market acceptance. Community acceptance refers to the acceptance of concrete RET project implementation (e.g., wind turbine implementation), whereas socio-political acceptance encompasses general acceptance (e.g., wind energy as an energy source). Market acceptance pertains to the diffusion of a certain technology and its adoption by the market.

Expanding upon this paradigm, Wolsink (2018) illuminates the dynamic and systemic nature of the acceptance process. He underscores the interplay between community acceptance, market acceptance, and socio-political acceptance, each dynamically informing and shaping the other through interactions of diverse stakeholders that can play different roles in different phases of the renewable energy implementation process (Wolsink 2010; Van Rijnsoever et al. 2015).

Socio-political acceptance manifests through the public, key stakeholders, and policymakers, and market acceptance through interaction between consumers, investors, and firms. For community acceptance, the interactions between local authorities, local stakeholders, and local residents are key (Wüstenhagen et al. 2007; Landeta-Manzano et al. 2018). It thereby goes beyond the notion of citizens or residents as the only relevant group expressing acceptance and it explicitly looks at citizens as part of a community.

<sup>1</sup> See Appendix C.

Although community acceptance does not exist in isolation and is one facet among others (Ellis and Ferraro 2016; Wolsink 2018), we specifically zoom in on what dynamics and processes are at play at the community level.

The role that actors take or that is allocated to them in society allows them to shape community acceptance processes and the RET project through different forms of engagement and social interaction in energy transition discourse and processes (Van Rijnsoever et al. 2015). Traditionally, much research has focused on more influential roles of residents in relation to acceptance, often assuming the two are inseparably linked. However, more recent studies have moved beyond this resident-centric focus, exploring the various roles that multiple actors can have within RET processes and how actors react and adapt to these roles over time (Chilvers and Longhurst 2016; van de Grift and Cuppen 2022). Moreover, some of these actors are assigned explicit formal or informal roles in the process and can actively (or passively) shape the acceptance process. Important to note is that these roles can be informed by formal and informal procedures, but can also be more reactive in nature, for example, triggered by certain responses (van de Grift and Cuppen 2022). In our analysis, we therefore explicitly consider different actor groups and the various actor roles that are relevant in the local interaction to understand the dynamics on the community level and how they come about.

## Responses

What complicates the understanding of acceptance as a process is that the term is interpreted in various ways and often relates to a certain response or outcome. In this outcome-oriented realm, acceptance has related connotations like acceptability, support, and tolerance that are often used interchangeably (Busse and Siebert 2018). In addition, these terms are often loosely defined or not defined at all, see e.g., Perlaviciute et al. (2018), Busse and Siebert (2018). On top of that, there is barely uniformity in the operationalization of acceptance, meaning that acceptance measurements vary widely (see Batel et al. 2013 for examples of how acceptance is measured).

Some scholars see acceptance as one possible outcome, alongside other outcomes like tolerance, support, and opposition (Petrova 2013). Perlaviciute et al. (2018) understand acceptance (next to apathy, support, etc.) as one of the possible manifestations of acceptability, which they define as a broad concept that refers to people's general evaluation of energy projects. 'It manifests itself in people's opinions as well as their (intended) actions and can be accompanied by emotional responses to these projects.' (Perlaviciute et al. 2018, p. 50).

Batel et al. (2013) empirically distinguish acceptance from support. They consider support a more active form

of acceptance that implies a favorable position towards the project whereas acceptance is a more passive response. Bertsch et al. (2016) understand acceptance not as a single outcome, but as a range of possible approval responses towards renewable energy technologies and policies, from passive to active. We follow this definition in understanding the process of acceptance as it allows for considering 'silence' (not resisting, but also not supporting renewable energy deployment) as a response. Considering silence as a form of response can give valuable insights into the response dynamics of non-outspoken actors, and possible response dynamics that are part of uncontested RET processes.

Responses in the process of acceptance are not shaped in a vacuum (Walker et al. 2013) but rather through engagement with the energy projects, negotiations, and social interaction (Jones and Eiser 2009; Wiersma and Devine-Wright 2014; Dällenbach and Wüstenhagen 2022). The literature on social acceptance has identified many factors that influence acceptance. As can be seen in Fig. 1 (Appendix A) different factors seem of importance for community acceptance (e.g., participation and distributional justice). While these factors give insights into what seems important for acceptance, they do not show how they interrelate in a process and to what extent they are steering factors for acceptance.

## Objects of acceptance

A final dimension of the acceptance process is the object of acceptance: 'what' is accepted. System change towards a sustainable energy system affects actors in many ways and requires alterations in several aspects. As Wolsink (2012) addresses in the context of wind power, there are many decisions connected to wind energy implementation. More concretely, 'what' is an object of acceptance in the socio-political dimension (e.g., wind energy as a source in a socio-technical system) might not correspond with the acceptance object in the community acceptance dimension (e.g., spatial implementation of a specific wind energy project). The distribution of decision-making across scales, from international to local, often results in more concrete decisions on the local level (Perlaviciute and Squintani 2020). Thus, 'what' is being decided upon differs across scales. This shows the multiplicity of different objects and their characteristics that can be subject to responses across different scales of implementation (Wolsink 2012; de Wildt et al. 2021).

Empirical work shows that on a local level, this often comes down to decisions on concrete projects, the location of RET, the types of RET, the process, and the distribution of benefits (Perlaviciute and Squintani 2020). Also, the specific forms of distribution of benefits or characteristics of the process can influence the overall acceptance (Cowell et al. 2011; Langer et al. 2017). We specifically look at what

objects the subjects of acceptance relate to in the process of community acceptance.

Acceptance is not a one-time decision and it is not static (Küpers and Batel 2023). As Wolsink (2007a) explains, attitudes are dynamic and can change over time. His research on wind energy attitudes shows a so-called U-shape development, where as soon as people are confronted with a technology their opinions turn, but alter positively again after an energy technology has been constructed. This U-turn effect could only be seen when environmental impact was adequately taken into account. This shows that public attitudes change with changing circumstances and conditions. We include this time element by looking at the different attitudes, actors, and objects across different phases of RET implementation on the local level.

## Methodology

### Research design

This paper follows a qualitative research design. Empirical data were gathered through an in-depth case study analysis of wind- and solar projects in The Netherlands. To get a better understanding of the process of acceptance, we chose wind and solar projects that can be classified as ‘uncontested’ and thus administratively successful. More specifically, we selected 8 irrevocably authorized and/or operational wind and solar projects in the Netherlands that were implemented without delay due to opposition. More specifically, the

selection of cases was based on the absence of filed court proceedings towards the RET project proposal, as this is where delay due to opposition is most well reflected. Above all, this selection of cases provides an important empirical counterbalance to the majority of acceptance research which mostly reports on cases that faced opposition resulting in delay or postponement of RET projects.

Dutch RET development processes are shaped by both formal and informal institutionalized processes. Formal institutionalized processes are the procedures that are legally part of the spatial development process on the local scale. These formal processes trigger many informal processes, like early informal consultations. Looking at these different processes, RET development can roughly be divided into four development phases: the preliminary phase, the permit phase, the construction phase, and the operational phase.

The preliminary phase is the phase before an official permit application is submitted. It is characterized by informal conversations between developers, authorities, experts, and, in some cases, residents. In this phase, the project develops from an idea to a concrete RET plan and design. This phase is informal as no official legal decisions are made. The permit phase, in contrast, is a formal phase where legal rules determine the terms and procedures. It starts when a permit application is submitted to the relevant authority and ends with a formal binding decision of approval. The construction phase starts when the appeal period expires and ends when construction finishes. Finally, the operational phase is the phase where the RET is operational and produces electricity. Table 1 shows the selected wind and solar projects,

**Table 1** Selected wind and solar projects in The Netherlands

	Project	Development phase	Location (city and municipality) and characteristics	Size	Business-model/set-up	Number of interviewees
1	Solar park Kooypunt	Operational	Den Helder (Den Helder)—located in a business area	15 ha	Non-cooperative	5
2	Solar park De Dogger II	Irrevocably authorized in 2018	Den Helder (Den Helder)—located between business and rural area	5 ha	Non-cooperative	5
3	Solar park Molenwaard	Operational	Hoogezand (Midden-Groningen)—located in rural residential area	35 ha	Non-cooperative	7
4	Wind park Spinder	Operational	Tilburg (Tilburg)—located between business and nature area	4 turbines	Partially Cooperative	2
5	Wind park Heibloem	Operational	Heibloem (Leudal)—located in rural area	2 turbines	Cooperative	3
6	Wind park Ferrum	Operational	Ijmuiden (Velsen)—located in industrial area	3 turbines	Non-cooperative	4
7	Solar park Zonedorpen	Operational	‘t Zand (Loppersum)—located in a rural residential area	0.085 ha	Cooperative	3
8	Solar park Heldair II	Irrevocably authorized in 2022	Den Helder (Den Helder)—located in a business area	18 ha	Non-cooperative	3

their location, development phase, size, business model, and a number of interviewees. Among the uncontested cases developers identified either as cooperative (cooperation) or non-cooperative (private business) developers.

We took a project-focus lens to be able to analyze the complex processes of RET project implementation, the roles of different actor groups, and how responses came about. For each project, we asked interviewees about the different phases of RET project implementation. We specifically considered the different objects of acceptance on the local level, the actors that were involved, and how they engaged with the project and each other. We combined this process-oriented approach and looked for a range of responses, from passive (approval) responses to active (approval) responses (e.g., from silence to support). Table 2 shows how we operationalized the acceptance process of RET projects.

## Research methods

### Data collection methods

This study makes use of qualitative data collection and analysis. In contrast to the often-used large-scale quantitative opinion polls, a qualitative method is more suitable for uncovering underlying dynamics that drive processes. In our process-oriented approach, using a qualitative method is particularly advantageous because of its ability to uncover detailed lived experiences, meanings, and explanations of processes ascribed by different individuals (Creswell and Creswell 2017).

We held thirty-two interviews with key stakeholders from the selected cases. Interview questions (see Appendix B) were developed based on the operationalization presented in Table 2. Stakeholders were identified according to Friedman’s definition of stakeholders: relevant actors affecting or being affected by decisions or actions (Reed et al. 2009). Snowball sampling was used to identify the first group of stakeholders. Special attention was given to an often-heard critique in the literature, namely that acceptance is often operationalized as either outspoken opposition or outspoken support, often neglecting that there is a silent middle group (Dermont et al. 2017; Stadelmann-Steffen and Dermont 2021). This silent middle group, however, can act as an important influencer of the implementation process and was hence included. We did that by complementing the first group of stakeholders with stakeholders selected through a random selection of local residents. As we specifically focus on community acceptance, stakeholders were eventually classified according to the subjects of community acceptance identified by the literature, namely local residents, local authorities, and local stakeholders (Wüstenhagen et al. 2007; Wolsink 2010). Table 3 shows the classification and amount

**Table 2** Framework for studying community acceptance as a process

Phases of RET project implementation (time)	
Actors involved (who)	Object of acceptance (what)
Preliminary phase, Permit phase, Construction phase, and Operational phase	
Actors involved (who)	Role of actors (how shaping)
Classified according to role in society following the conceptualization of Wüstenhagen et al. (2007): Local authorities Local stakeholders Local residents	Ranging from active or passive (in)formal shapers of the RET implementation process
Responses (how accepting)	Object of acceptance (what)
Responses ranging from passive (opinion + no expression of opinion) to active responses (opinion + forms of expression of that opinion) in the RET implementation process	Aspects (and its characteristics) of the local RET implementation process

**Table 3** Categorization of interviewees of selected RET projects

Actor group classification	Amount of interviewees
Authorities	6
Residents	16
Other stakeholders:	10:
Developers	6
Interest groups	4

of interviewees per actor group. The point of saturation was found at thirty-two semi-structured interviews.

### Data analysis and interpretation methods

The transcribed interviews were analyzed following a two-coding-cycles approach. The first cycle consisted of process coding. Process coding helped us to identify emergent themes and discover similarities and differences across interviews (Saldaña 2016). The second-cycle coding consisted of elaborative coding. In this cycle, we translated the emergent themes into the framework by, when possible, categorizing them according to the operators, deductively derived from the literature, in Table 2. Themes that did not fit the dimensions of the framework were categorized independently. This elaborative coding was done to define and understand the main processes important for community acceptance and to reflect on the initiated analytical framework to study community acceptance.

## Results

In this section, we describe the details of the acceptance processes over time, for the different phases of the RET project implementation. This helps us to tease out the changing roles of actors over time along with the varying responses and objects of acceptance. Quotes are illustrative of the observations unless defined as exemption.

### Preliminary phase

Of all phases, actors' opportunities to shape and influence the project are the largest in this phase. At the same time, the role of actors is least defined in this phase. Further, we observe that the responses formed in this phase do not change much in later phases. These responses relate to the project as a whole and its spatial embedding and are much broader than just technology acceptance. Below we describe our results in more detail.

Among the uncontested cases, projects were both initiated by cooperative developers (three) and non-cooperative developers (five). In most instances (seven), there

was an earlier attempt to develop the location, it was mentioned in policy documents as a suitable location, or it was an area with other (RET) developments. Both cooperative and non-cooperative developers were driven by perceived business opportunities. Notably, cooperative developers were distinguished by predefined social values guiding their activities, for example, aiming to enhance financial inclusivity in the energy transition or benefit the local community.

‘We had predefined criteria for development [...] for us it is important that a single mom should also be able to partake in the solar field’ - Cooperative developer

The developers took an active, initiating role. In most of the cases, the developer reached out to local authorities with the RET idea as soon as they eyed a location.

Interestingly, all local authorities, regardless of their response, took an active and facilitating role as soon as the RET idea was communicated. This role encompassed, checking internal political support as well as consulting internal and external experts about policy and spatial rules and requirements, and weighing their advice. This process was slower for hesitant authorities, often requiring additional participation and stricter rule interpretation. Consultation processes between developers and municipalities were most frequent in the preliminary phase.

Residents were involved once the RET project was considered feasible by experts and authorities. Overall, residents were either passively involved or actively influencing the RET process. Residents had three roles: inaction (by being notified, listening, or joining info evenings), shaping spatial integration (by giving opinions/thinking along during info or consultation sessions or responding to feedback forms), or taking an active role regarding benefits distribution (by setting up distribution community benefits).

For both authorities and residents, we see that roles and responses are dynamically related. The responses of local authorities' responses ranged from hesitant or rather positive. Hesitant responses were often attributed to upcoming elections or local authority's lack of expertise with RET development processes.

‘When they [developer] first came in, our alderman considered it [RET] very sensitive, but that also had to do with the fact that the elections were coming up’ - Local authority

In contrast, favorable responses stemmed from alignment with municipal environmental visions and policy or failed previous development attempts while there were existing development aspirations.

The responses of local authorities stayed positive or grew more positive after observing implemented requirements,

advice, and design and spatial adjustments. Moreover, good cooperation in the preliminary consultation and formation of trust was important for enduring positive responses from local authorities over time.

‘Although in theory, it should not matter if you have to deal with person A, B, or C, it does matter what type of people you have. And with this developer there was just mutual trust and good consultation.’- Local authority

Three types of resident responses were identified upon notification about the RET plan: disliking, not minding, and being fine with RET plans. Notably, ‘being fine’ was the most robust positive response. Responses were not only related to the RE technology, but also to other aspects of the RET project (e.g., location, spatial integration, process) and stemmed from health concerns, (dis)trust in the developer, spatial fit, impact compared to previous plans, personal interests, and understanding the urgent need for green energy.

‘I do not like it. That’s very simple [...] we understand that there should be solar parks, but rather not in my backyard, so to speak.’- Resident

‘From the beginning onwards, I was fine with solar panels instead of the original housing plans.’- Resident

‘Initially, I was fine with it because at that time it was not yet known that there would be a supply freeze.’- Resident

Interestingly, residents sometimes refrained from expressing their opinion, hence both passive and active responses were present, ranging from a silent opinion to joining information evenings or actively expressing opinion in consultation sessions. In the majority of the cases, residents sensed that the RET plan was predetermined before being notified. People refrained from voicing opinions and chose a passive role when they trusted the RET plan development or believed their influence towards one or more aspects to be negligible. Hence, inaction did not always imply acceptance.

‘In terms of decision making, I mostly went along with what people who did go to those meetings told me. I never delved into the possibility of objecting or whatever. I thought it was fine.’- Resident

‘We were informed via an invitation letter [...] of course you could go to an info evening, but we often know how it works: you can go and protest, you can say we don’t want that, but it is pushed through anyway.’- Resident

In only two cases, people were invited to think along with spatial plan integration. Reasons for taking this opportunity, and thus taking an active role, were mainly the desire for influence despite the thought that the RET plan would go through either way. Reasons for choosing a passive role and not joining the consultation opportunity ranged from trusting others to considering their interests, or time constraints.

‘I thought this RET idea is really compromising my view, but if it is going through anyway, I want to see if I can get it to my liking.’- Resident

In two cases residents consciously took a more active role than the one assigned to them by developers: they set up a community fund for distribution of benefits.

‘We have established a neighborhood cooperative so that we can keep everyone informed about the developments that take place and also about the finances and so on so that they cannot play us against each other.’- Resident

Results indicate that residents’ active or passive responses are influenced either by a lack of reservations or perceived roles. We observed a reciprocal influence between residents’ responses and their perceived roles. It became evident that authorities’ responses shaped the intensity of their role, whereas their (perceived) role does not seem to significantly impact their response patterns.

## Permit phase

In this phase, opportunities to shape the project were reduced to yes/no aspects of the overall project. Formal rules for participation reduced actors’ influence scale and scope.

In the permit phase actor roles adhere mostly to formal institutional rules. In all cases, developers formally applied for RET permits after receiving authorities’ and experts’ informal feasibility confirmation. Depending on existing policies, developers had to demonstrate public support or engagement by reporting on information and consultation sessions. Overall resident involvement decreased compared to the preliminary phase.

The role of the authorities changed from facilitator to formal permit assessor and licensor in this phase.

‘During the preliminary process you are more coordinating [...] during the application phase you are, of course, the competent authority.’- Local authority

Authorities must assess permits within a set period, during which stakeholders can formally express complaints (formal views) and, thus, can have a more formal role. Authorities have the responsibility to check these views and respond to them. In all cases where formal views were filed, authorities declared them invalid as RET plans met

feasibility requirements and were perceived, seeing the small number of filed views, as being in the public interest.

For residents a shift in access to roles could be observed, encompassing: inaction, filing formal views, and filing court procedures. Inaction correlated with a passive approval response, driven by being okay with at least one or more aspects of the RET project (location, design in general, and openness of developer), or not wanting to struggle against the majority or resource limitations concerning the complex bureaucratic processes of filing complaints.

'You can indeed object [...]but I did not do that because I am fine with it.' - Resident

'Of course, you can object. But let's be very honest, it is like with an election, if 100 people object and 200 do not, then it stops anyway. [...] you can nag about that, but that is just the way it works. That's democracy, isn't it?' - Resident

'I also just think that most people, [...] are kind of meek sheep anyway and just accept a lot of things. And especially, of course, because it is often difficult to be able to do something against bureaucracy [...].'  
- Resident

In two cases, stakeholders and residents did make use of a more formal role by filing formal complaints. Reasons for filing views were: developers' refusal to compromise on RET plan adjustments, missing public interest considerations in authorities' RET approval, and wanting to make a formal statement about the reasons for their opinion.

While no cases led to court proceedings, considerations for filing for court were present. Considering court proceedings is a careful process of weighing different arguments and chances of success. The main arguments for stakeholders not to file court proceedings were limited person power, limited time, and only partial objections to the RET implementation.

Despite formal roles, residents wielded the most shaping power in the preliminary phase. Formal roles mainly allowed yes/no decisions, with limited room to negotiate on sub-aspects, as the content of formal views is weighed against practical feasibility requirements. Furthermore, residents' responses remained heterogeneous towards different aspects and remained unchanged towards the next phase (except in the case of changed circumstances, which altered some responses either positively or negatively). Particularly, passive responses related to perceived disempowerment in the preliminary phase shined through passive responses and roles in the permit phase.

## Construction phase

The developer's role shifted towards a business role once the permit was officially granted. Primarily, they negotiated with contractors and aligned construction planning with authorities. In rare cases, they continued to address resident complaints about construction nuisance.

During construction, the authorities' role turned informal again and primarily comprised: monitoring the RET construction and supervising whether all requirements were being met. They, thus, kept a facilitative role towards the developer and a supervising role towards the RET project construction.

While residents' and stakeholders' roles decreased, their responses remained present in this phase and were two-fold: liking or disliking different objects during the construction phase. Displeasure with construction noise is the most common. Most residents did not further express this, except for some towards the developer. Furthermore, two other responses were expressed concerning the process of the RET project: like and dislike. A continuous information flow throughout the RET development phases was the main reason for being fine with the process.

'When they were constructing it I did experience some inconvenience, but well you have to take that for granted because there has to be the construction of course.' - Resident

'During construction, we did not experience any inconvenience. Besides, there has been some information there as well.' - Resident

Disliking the process, on the other hand, stemmed from the developer failing to keep residents informed (about the building phase and/or about process phases in general). Interestingly, residents did neither express nor act on this dislike response towards the developer.

'I would at least have liked to have been informed on how far the plans were, how far along the plan is when they are going to start [...] I don't need to get more involved but to be kept informed a bit [...].'  
- Resident

In two cases, residents and other stakeholders regretted not filing complaints after acquiring new information that could bolster their case.

'A week later we received a ruling [in our favor] from the State Council on a wind turbine [...] if we had known that a week earlier, the coin would probably have fallen the other way.' - Stakeholder



## Operational phase

Once the RET was operational, the developers' role remained small and entailed RET maintenance, revenue collection, and sometimes revenue distribution. In three cases, residents were somewhat involved in or because of the revenue distribution, either through a community fund for community benefits or through cheaper energy for local members of the cooperation. In the cases of revenue distribution through a community fund, residents were involved in decisions about how redistributed money for future community projects is spent. With revenue distribution via cheaper energy, the cooperation's memberships increased, making residents shape possibilities of the cooperation's future energy transition endeavors. Interestingly, revenue distribution through a community fund was both present with a cooperative and non-cooperative developer. In cases without revenue distribution, the developer did not involve residents any further after the construction phase, and mostly passive roles could be observed.

Residents' post-realization responses remained similar to those during the RET development. Their responses differ towards different aspects of the RET development process. On the one hand, residents did not mind the RET or its aspects. Reasons for lack of reservations towards RET or its aspects range from: being fine with RET from the beginning, because of the spatial integration (meeting expectations/getting used to it), experiencing the process as transparent or feeling the ability to show influence, or approving of the distribution of benefits. In that regard, their role in earlier development phases can shine through their responses in the operational phase.

'I think they did very fine in terms of the height of the park [...] this is really very neatly done I think.'- Resident

On the other hand, some residents showed reservations towards RET, or its aspects, after realization. Reasons ranged from: disliking the maintenance or the spatial integration (location and way of integration), increased health worries, feeling poorly informed (so not necessarily because of not having influence), dissatisfaction with the distributional outcome, or increased worries about future developments after receiving new information.

'The only downside is that they [developer] made a promise that there would be bushes around it, [...] they put plants in there [...] but that did not have any water [...] so yes, that as such is a bit of a failure. [...] No, yes, that's actually a bit sloppy, that could have been done better.'- Resident

'Well, I was just a little less enthusiastic about the RET being surrounded by a dike. Because with that, my view is just gone.'- Resident

'I am very easygoing with it, I find it all fine, as well the construction, I do not have a problem with that. But as I said, if you are promised more information, then they [developer] should provide that.'- Resident

Overall residents show few active (approval) responses and few active roles after realization. An exception is seen when a form of revenue distribution occurs.

## Discussion

The results presented above demonstrate the interaction between the different dimensions of acceptance (who, what, how) over time. Throughout the discussion, we address the process of acceptance by zooming in on these dimensions and their interaction. We see that the process of acceptance goes beyond resident acceptance alone, that acceptance comes about rather through a weighing process than a fulfilled checklist, and that roles can influence and interact with responses dynamically.

### Community acceptance going beyond citizen acceptance

First of all, empirical results reveal that the process of acceptance comes about by the interaction of multiple actors. Authorities, residents, and other stakeholders define the acceptance process and need to be engaged to achieve acceptance. Especially in the beginning, municipal support is crucial for a successful RET implementation process, making them gatekeepers for acceptance. Community acceptance, thus, goes beyond citizen acceptance alone. While research often stresses the importance of deliberative citizen involvement for acceptance (Gross 2007), this focus on citizens alone misses nuance. In fact, actor involvement is a highly dynamic process for which everybody has to be on board to a certain extent to make it work. This also shows that the idea that acceptance is something controllable and something to steer is short-sighted in its focus on citizens alone.

### Varying objects of acceptance within the RET implementation process

These multiple actors respond to various objects that they consider important for acceptance. We could distinguish seven objects actors responded to in their consideration of acceptance: the location, the RE technology, the spatial integration, the process, the construction, the distribution of benefits, and the indirect effects and aspects of RET implementation. These objects of acceptance emerged throughout the different phases of the implementation process.

Prior research confirms differences in acceptance objects across RET-decision-making scales (e.g., RE in general or locally installed RE technologies) (Wüstenhagen et al. 2007; Perlaviciute and Squintani 2020). Our results disclose that acceptance objects also differ within one decision-making scale (in our case the RET implementation process), as actors' responses relate to different aspects of the RET implementation rather than the RET implementation in general. What is more, while we still do not fully understand the feedback loops between community acceptance processes and other facets of social acceptance (socio-political/market acceptance), we see that not only implementation-related aspects but also more general aspects are acceptance objects in the community acceptance process. This also hints toward Wolsink's (2018) argument that the different tenets of social acceptance shine through/inform each other and that local acceptance is embedded in broader societal concerns (Batel 2020).

Besides, these objects showed a great variety of characteristics. We see differences between cases regarding characteristics of the location (rural vs. industrial), type of RE technology (wind vs. solar), spatial integration (visible vs. not visible after integration), process (participatory vs. not participatory), and distribution of benefits (present vs. not present). What stood out was that solar parks did not significantly face different responses than wind parks. Interestingly, unpacking these different objects and their diverse characteristics shows that technology is only one of many aspects that individuals consider important for acceptance. This nuances the notion of RET acceptance as such.

### Varying responses of acceptance within and across actor groups

There is a variety of underlying discourses underpinning responses. Authorities show different responses ranging from hesitancy towards support when they first hear about the RET project. Also, residents responded heterogeneously towards different aspects of RET implementation (e.g., not minding the spatial integration, but minding the lack of information provision) or even towards the same aspects (e.g., one actor not minding lack of participation, another disagreeing with the process).

This corresponds with research on underlying reasons for opposition and proposition towards RET implementation, which highlights that responses within actor groups are hardly uniform (Ellis et al. 2007) and there is a multiplicity of complex and nuanced arguments within this dichotomy (Petrova 2013). The nuance that we see is, however, that apart from the variety of underlying discourses for approval responses, these responses also again relate to different aspects of RET implementation rather than RET implementation in general.

### Actors weighing responses over time

Similar to what Windemer (2023) found in the context of wind energy implementation, we see that actors' responses towards wind- and solar energy implementation do not change much over time, contrasting common U-shape expectations that acceptance will increase over time (Wolsink 2007a). Instead, we see that responses relate to accepting one aspect over the other (e.g., not liking the visibility of RET, but accepting the process). As different objects of acceptance emerge over time, responses seem to be formed through a process of evaluating and weighing various aspects in relation to each other. This goes beyond the idea, often encountered in policy, that responses are formed by statically adhering to a universal checklist of criteria influencing acceptance. For example, authorities' responses are based on weighing the extent to which objects and their characteristics fulfill political and practical requirements over time. For residents we could see that responses are based on a similar weighing process between objects and their characteristics, but also on the role the residents *can* and *want to* take in the implementation process. For residents we could, thus, see that their response frame is informed by their estimation of the role they can play.

### Varying roles shaping aspects of RET implementation

We observed actors taking different roles in the process. For authorities, in the beginning, this role is less defined by institutional structures but becomes more formal over time. The degree of the facilitating, and proactive, role they take in the preliminary phase is largely motivated by the political climate and expertise within the institution.

For residents, we observed that their role is less formal and their chance of shaping the process is highest in the preliminary phase. We saw a broader range of three roles by how residents can influence the outcomes of local RET implementation. First, results show that residents can have a rather passive but influential role towards RET acceptance by inaction (this can include reading about it, being informed, and even joining info evenings). Inaction is mostly interpreted as acceptance and, thus, encourages authorities to approve developing RET. Observably, residents often consciously choose to not take an active role, either because of the lack of reservations (so emerging from a positive response) or due to disempowerment (time constraints, or feeling of having no influence anyway) to shaping the project (or aspects of it) towards acceptance. For residents, this shows that roles, and the influence that comes with these roles, can define actors' response frames.

While residents are often in more passive roles, two other roles emerged. In some cases, residents were able to think along and, thus, were offered a more active shaping regarding the spatial integration of the RET. In this case, shaping possibility is limited to a certain aspect, the spatial integration, of a RET project. Finally, in some cases, residents consciously adopted a more (pro) active role towards RET aspects, regardless of assigned roles from top-down procedures. Exemplary of this active role are some residents who shaped the outcome by influencing the distribution of benefits, which increased their acceptance of this object. Although (the taking of) roles appear to come about by the way procedures are shaped, they are not the exclusive determining factor. In addition to established roles, we observed the emergence of new roles, such as an active role in the distribution of benefits, which operated outside of established procedures (and not necessarily as a reaction to poorly implemented or deficient procedures). This illustrates that responses can also trigger the adoption of more active roles. Therefore, it is evident that roles and responses are dynamically interconnected.

We observed that actors' roles can serve as indicators of increased acceptance towards one aspect, without necessarily implying approval of other elements. For example, residents being offered an active role in the process considered the process more tolerable, and residents involved in the distribution of benefits considered the distribution of benefits more acceptable. Consequently, we observed that residents' acceptance of one aspect improved while disapproval of other aspects remained. Interestingly, the acceptance of some aspects, despite the remaining disapproval of others, seemed to suffice to increase the overall acceptance of RET. A positive response towards one aspect did in that regard influence the overall judgement of the RET implementation. As a result, accepting at least one object can significantly influence overall RET acceptance, indicating that people are sometimes willing to make concessions for the common good. In this, roles can enhance acceptance, but they are not the sole determining factors for overall acceptance. Instead, roles and responses interact dynamically and have the potential to increase the acceptance of objects while not necessarily leading to the approval of all.

### **Navigating nuanced participation in the process of acceptance**

The literature frequently highlights the connection between roles and acceptance by emphasizing the importance of inclusive and deliberative resident participation for acceptance (Gross 2007; Wolsink 2007b), not only regarding the process but also regarding the distribution of benefits (Cowell et al. 2011). We observe that in the literature this

call for inclusivity is often defined in terms of the number of people being (en-)able(d) to join a certain deliberative participatory format.

Our data reveal varying preferences in actor participation during the RET implementation process. We observe that inclusivity is not only reached by uniform participation but rather by offering different formats that target the different preferences of these heterogeneous actor groups. For example, those not seeking a bigger role, still desire inclusion through information regardless of their already positive response. Besides, inclusivity should span different participation formats throughout time, targeting different aspects actors want to shape. For example, actors accepted the object 'process' without desiring a bigger role, but still wanted to influence revenue distribution. This underscores that actors' desire for participation can vary over time and that actors do not necessarily want to be constantly engaged in the same way.

This aligns with research showing different participation preferences over time instead of optimum formats (Langer et al. 2017; Kluskens et al. 2019). To achieve inclusivity, participatory processes need to adapt to nuanced actor needs. Consequently, interventions should be targeted at enabling more nuanced participation formats, rather than changing opinions of actors overall. This is in line with recent work on participation which criticizes mainstream participation approaches for being too rigid, pre-given, and decontextualized (Chilvers et al. 2018). Hereby, participation should not be a tool to steer people, but it should rather empower them to access the whole response frame regarding objects of their choice, and thereby enhance overall acceptance.

## **Conclusion**

Our study revealed the dynamics of acceptance within the context of RET implementation. We have explored the interaction between various dimensions of acceptance over time.

First, our research demonstrates that acceptance is a multifaceted process involving multiple actors, including residents, authorities, and other stakeholders. Community acceptance goes beyond citizen acceptance alone and authorities are crucial stakeholders for community acceptance and further development of RET. We thereby challenge the notion that acceptance is solely related to citizen involvement and show that the sum of individual, and rather heterogeneous, approval responses by a variety of stakeholders can shape the overall acceptance outcome of RET implementation.

Second, by differentiating between actors, objects of acceptance, roles, and responses, we found that even in

uncontested cases, actors still disapprove of some aspects of the RET project. Accepting RET implementation seems to mean accepting certain, and not necessarily all, aspects of the RET implementation, ranging from the location to the process and distribution of benefits. By empirically differentiating between the different objects, we see how acceptance of one or more aspects can echo acceptance over the full RET project. Hence, even in the unproblematic cases acceptance is ambiguous.

Third, looking into the development of responses over time highlights the great diversity of responses towards different aspects of the RET implementation process. This variety of responses goes beyond the understanding of acceptance as a unanimity of positive responses to RET implementation in general, but shows responses are pluriform towards different aspects of an acceptance process. Furthermore, we show that individual responses as such do not change much throughout the RET implementation process. Instead, responses relate to different aspects of the RET implementation process and are formed by weighing one aspect against another. Diverse objects are being evaluated in relation to each other, making it rather a continuous negotiation and weighing process, than a static universal checklist of factors that have to be met for approval of RET aspects. Instead of focusing on factors influencing actors' responses, we show that acceptance is a dynamic process, where different objects and actor roles are evaluated in relation to each other.

Lastly, unpacking the different roles of actors in the RET implementation process highlights the various formal and informal roles of individuals throughout the RET implementation process. Overall we see that residents have more chances to influence the RET implementation in the preliminary phase regardless of their formal given role in the permit phase. Interestingly, roles do not necessarily only come about by (a reaction to) (in)formal existing procedures; we observed the emergence of roles outside those procedures and being dynamically interlinked with responses (also showing actors taking agency outside existing procedures). Additionally, we see that residents prefer different forms of involvement regarding different aspects of RET implementation. Actors' heterogeneous desires to shape different aspects of RET implementation call for more individualistic rather than generalistic engagement approaches.

Important to note is that participation (roles and influence) can, but is not the only factor for acceptance. We rather see that perceived roles can influence people's response frame and that preferences for roles vary within actor groups. Besides, these shaping preferences relate to different aspects and can thus influence how actors see certain aspects of the RET

implementation. Even in cases that seem unproblematic, there is still room for improvement in the process, given the preference for diverse involvement possibilities. It is evident that this heterogeneity of preferences over time is not adequately facilitated through current procedures. For example, even in the cases where people do not mind the RET or cannot take up a more active role in the process, it does not mean that they want to feel excluded by lack of information throughout the process. Rather than normatively addressing the best ways for involving residents, it emphasizes the need for a participatory process tailored to the unique preferences of different stakeholders regarding various aspects of RET implementation over time. This means offering a range of shaping options to cater to the diverse preferences of various actor groups.

Our research shows that acceptance is a multifaceted concept. By highlighting the temporally dynamic nature of acceptance, we show a different understanding of acceptance itself. This understanding consists of an interaction between different dimensions, namely: actors (who), roles, objects (what), and responses (how). This differentiation challenges the notion of acceptance as a one-dimensional construct. Our empirical focus on uncontested cases shows that divergence exists between how acceptance is understood as an outcome and as a process.

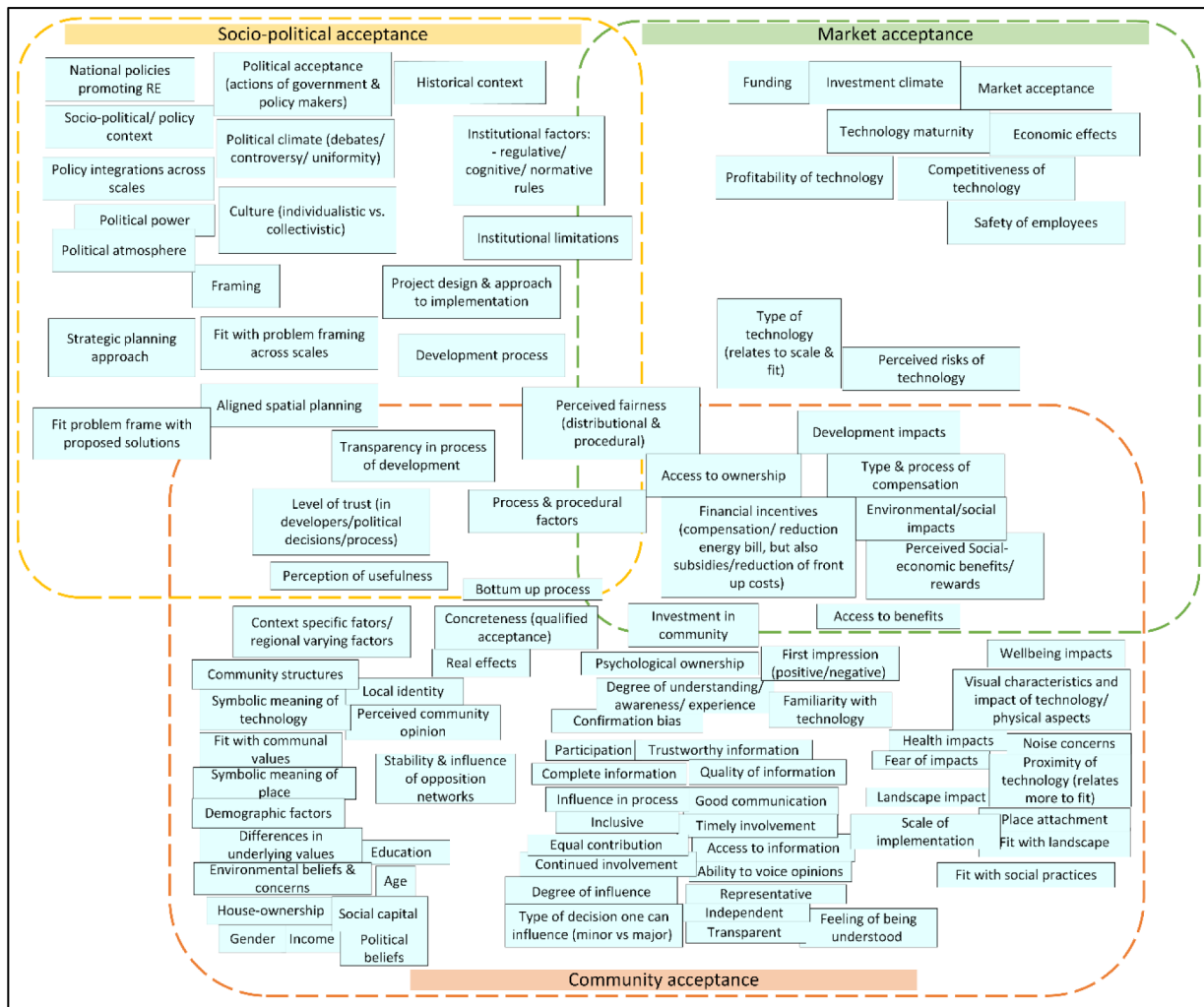
This understanding of acceptance as a dynamic process moves away from the 'checking the box' and outcome-oriented approach we often encounter in research and policy. Such a one-size-fits-all approach, where acceptance is to be met by meeting universal criteria, does not do justice to the nuances of acceptance processes. Evidently, by moving away from a purely outcome-oriented focus, acceptance of the energy transition becomes not merely an intended outcome but instead widely embraced by all actors involved.

With this research, we moved away from the normative top-down research perspective on how people relate and respond to energy technologies, related infrastructures, and changing social practices. By complementing scholarly insights with empirical insights this research adds to a more comprehensive and nuanced understanding of acceptance of energy transitions and RET. To further deepen understanding of the acceptance process, there is a clear need to further unpack the factors and conditions that impact actors' acceptance of particular elements of RET implementation, with a focus on understanding the threshold, and the dynamics around it, at which acceptance of one object can lead to overall RET acceptance. This would also give a better understanding of how actors weigh their responses towards different objects over time and the specific effect of various roles in this dynamic. These research lines can further facilitate the call for a more critical and dynamic approach to acceptance as a process.

# A Figure of factors hampering or facilitating acceptance

See Fig. 1.

## A. Figure of factors hampering or facilitating acceptance



**Fig. 1** Factors hampering or stimulating acceptance-related responses of RET in a renewable energy transition context. This model is based on the literature review of the following articles: Upreti and Van Der Horst (2004), Devine-Wright (2007, 2011, 2017), Jones and Eiser (2009), Huijts et al. (2012), Bidwell (2013), Petrova (2013), Aas et al. (2014), Wiersma and Devine-Wright (2014), Soma and Haggett

(2015), Stenekes et al. (2016), Larson and Krannich (2016), Sütterlin and Siegrist (2017), Perlaviciute et al. (2018), Landeta-Manzano et al. (2018), Kokkinos et al. (2018), Mjahed Hammami et al. (2018), Whitmarsh et al. (2019), Suškevičs et al. (2019), Liu et al. (2019), Leer Jørgensen et al. (2020), Bevk and Golobič (2020), Segreto et al. (2020)

## B Interview questions

### Opening questions

- Context of the interview
- Consent
- Questions about the person: job, position in that job, etc. Living in the area

### Questions regarding decisions of RET project implementation

- Can you tell a bit about how the RET project came about?
- Can you give me some insights about the characteristics of this project?
- When was the moment you heard this project was going to take place here?
- What had to be decided from the moment you heard about the project?
- What had been decided already when you heard about the project?

### Questions regarding the feeling of acceptance over time and questions regarding what influenced their acceptance-related response

- How would you describe your (initial) response and feeling towards the project?
- Why did you have that initial reaction?
- How was this response expressed/ manifested?
- In what way did this response change/stay the same over time?
  - o Why was that the case? (important turning points?)

### Questions regarding role + and how that changed over time

- How would you describe your role in the RET project implementation process
- How would you describe how you are involved in the project (tasks, decision power)
  - o Why was that the case?
- To what extent did this involvement and role change/ stay the same throughout the whole project?
  - o Why was that the case? (important turning points?)
- Who else was involved in this process?
- What was their role and in what way were they involved?
- To what extent did their role and involvement change/ stay the same throughout the process?
  - o Why was that the case? (important turning points?)
- How did you experience the process of this RET project development?

### Closing questions

- Anything else that comes up in your mind related to this RET project?
- Upcoming projects/ plans for the future?
- Who else should I talk to?

## C Critical literature review

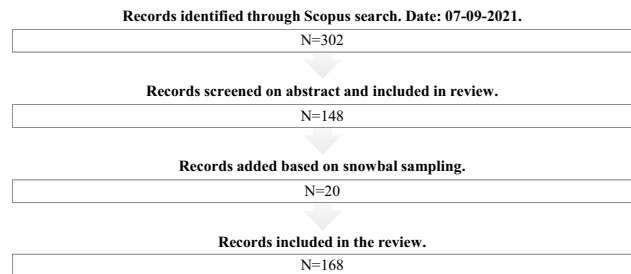
A critical literature review was performed to identify the most significant publications in the field.

Search string (Title, abstract, keywords) in Scopus:

(“social” OR “Public” OR “Citizen” OR “End-user”) AND (“Accept\*” OR “Domesticat\*” OR “Attitudes” OR “Adopt\*” OR “Approv\*”) AND (“Reject\*” OR “Repudiat\*”

OR “Oppos\*” OR “Resist\*” OR “Defianc\*”) AND (“Participat\*” OR “Engag\*” OR “Involv\*”) AND (“Sustainab\*” OR “Renewable” OR “Green”) AND (“Project” OR “Projects” OR “Implement\*” OR “Socio-technical experiment” OR “experiment” OR “Design”).

Excluded disciplines: healthcare, mathematics, chemistry, neurology.



**Author contributions** Nikki Kluskens: Conceptualization; Methodology; Formal analysis and investigation; Writing original draft; Writing review and editing. Floor Alkemade: Conceptualization; Writing review and editing; Supervision. Johanna Höffken: Conceptualization; Writing review and editing; Supervision.

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**Data availability** The data that support the findings of this study are available for the authors of this research. The availability of these data, which were used under license for the current study are not publicly available to preserve individuals’ privacy under the European General Data Protection Regulation.

## Declarations

**Conflict of interest** The authors declare no conflict of interest.

**Informed consent** Interviews were conducted after informed consent.

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