Group-Influenced Autonomous Motivation for Pro-environmental Behaviour

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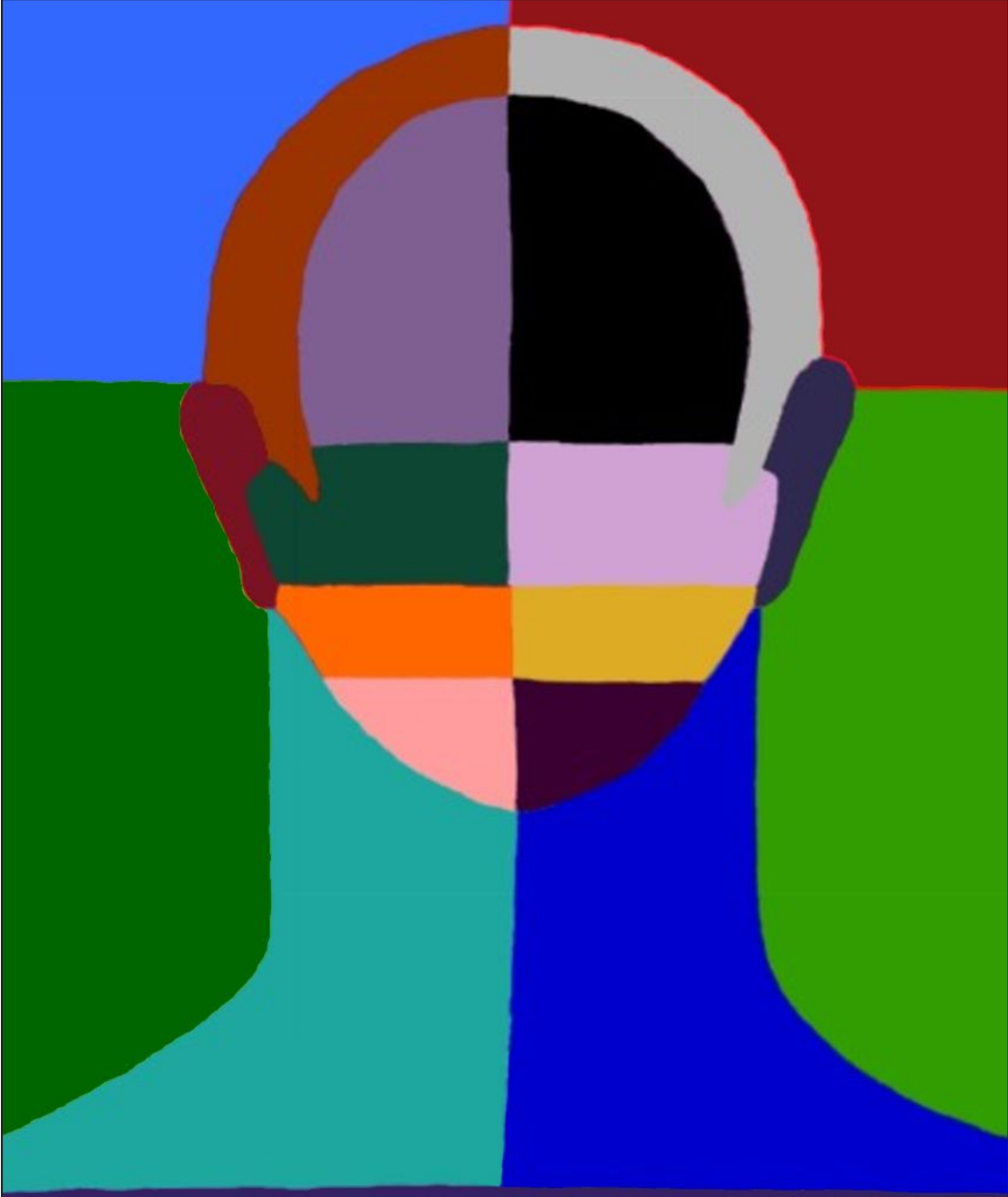

Group-Influenced Autonomous Motivation for Pro-environmental Behaviour

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Group-Influenced Autonomous Motivation for Pro-environmental Behaviour

Factors influencing the internalisation of group norms as autonomously motivating

PhD thesis

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Abstract

This doctoral dissertation constitutes a comprehensive exploration of the intricate interplay between group norms, autonomous motivation, and sustainable behaviour. The research is structured into three main body chapters, each contributing to a nuanced understanding of the complex dynamics at play.

The conceptual chapter, which establishes the theoretical foundation of the dissertation, synthesises insights from philosophy and psychology to formulate a robust conceptualization of autonomous motivation. Central to this conceptualisation is the assertion that autonomy plays a pivotal role in sustaining behaviour in the absence of surveillance or incentivisation. The defined autonomous motivation is posited as superior to intrinsic motivation, as it integrates principles from both Self-Determination Theory and the Social Identity Approach. This integration renders autonomously motivated behaviour meaningful and an internalised part of one's identity, eliminating the necessity for enjoyment to be experienced for the behaviour to be sustained. The chapter delineates three core components of autonomous motivation: Self-Governance, derived from Kant's categorical imperative; Volitional Resolve, rooted in Frankfurt's hierarchy of desires; and Self-Authorship, further divided into Personal Self-Authorship and Social Self-Authorship, drawing inspiration from Raz's conceptual framework.

The subsequent scale development chapter presents a measurement tool called the Philosophically Informed Conceptualisation of Autonomous Motivation (PhICAM) featuring 16 items in 4 sub-scales. Using a sample of 172 participants from the United States (Study 1), 292 first-year psychology students from the University of Groningen (Study 2), and 222 first-year sociology students from the University of Utrecht (Study 3), the scale demonstrates reliability and validity in both English and Dutch translations. This chapter lays the groundwork for experimental empirical investigations and confirms that different understandings of autonomy based on competing philosophical discourse can each contribute to how participants experience autonomous motivation for different behaviours.

The final empirical chapter, focusing on experimentation, unfolds through three distinct studies aimed at clarifying the causal processes linking group norms, autonomous motivation, and sustainable behaviour. Study 1 (n=118) manipulates group norms to encourage participants to sign a petition committing to reduced meat consumption. Study 2 (n=213) employs framed

messages about a meat tax, examining its impact on meat consumption. Study 3 (n=1014), a nationally representative investigation, manipulates group norms related to lab-grown meat, nuclear power, and farmers' protests, exploring their influence on autonomous motivation and acceptance of sustainable policies.

The overarching conclusion of the dissertation underscores the critical role of autonomy in decision-making processes, with autonomous motivation identified as a key mediator in the relationship between group norms and sustainable behaviour. The research emphasises the contextual nuances that influence the strength of this mediation, considering the type of behaviour, the available actions, and the specific groups referenced in normative manipulations. Depending on the nature of these factors, a different subscale of the PhICAM scale may be more relevant and informative of what autonomously motivates people, and whether this is based on universalisable reasons, comprehensive goals or evaluative desires.

The results from this analysis suggest a complex role of autonomous motivation, and therefore call for further research so that this research may meaningfully contribute to societal progress, particularly in the context of the energy transition and climate change mitigation. Integrating insights from social psychology and philosophy with interdisciplinary innovations is deemed essential for devising strategies to limit climate change and drive sustainable behavioral change at both individual and societal levels.

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1. General Introduction

Individual and societal consumption behaviour will need to change in order to contribute adequately to an energy transition to mitigate further climate change (Intergovernmental Panel for Climate Change; IPCC, 2022). This PhD dissertation seeks to understand how theoretical insights and empirical studies can aid in understanding the conditions required for people to be motivated by group norms to engage in sustainable behaviours for autonomous reasons. If people are autonomously motivated to behave sustainably, this is often more likely to be maintained over time and across contexts (e.g., Milovanović, 2020). Social psychological and philosophical insights are important to consider when designing policies to adequately and effectively foster a change in behaviour. Without such insights, policies will likely not sufficiently preserve autonomy and may instead require surveillance or incentivisation.

1.1. Climate Change: A Global Challenge

Climate change is one of the most complex and complicated problems to deal with in the world going forward. There is scientific consensus that anthropogenic climate change—climate change caused by human activity—is contributing to a faster rate of climate change, with dire ecological, social and political consequences (IPCC, 2022). Specifically, the Paris Climate Agreement, signed by 196 countries in 2015, legally binds the signatories to making efforts to contribute to keeping the increase in global average temperature well below 2ºC (and preferably below 1.5ºC) above pre-industrial levels (UNFCC, 2015). By the time of the writing of this dissertation, less than 10 years after the signing of the Paris Climate Agreement, IPCC reports from 2023 already deem it “likely that warming will exceed 1.5°C during the 21st century” (IPCC, 2023, p.10) and other sources suggest a mere 1% chance of limiting warming to less than 1.5ºC (Raftery et al., 2017).

This kind of collaboration and commitment of nations for a single issue of global importance demonstrates the significance of climate change. The fact that the original goal of staying below a 1.5ºC increase in global average temperature already seems out of reach, and it will be challenging to remain below 2ºC increase (IPCC, 2023) demonstrates how complex and multifaceted the problem is. What makes climate change so difficult to tackle is that it relies on actors on all levels of analysis to cooperate on a global scale in what might be the largest game of prisoner’s dilemma to have ever been conceived. While it is globally beneficial to mitigate

climate change, individual actors, groups and even nations may benefit from unilaterally defecting from international climate accords.

To illustrate this further, the Sustainable Development Goals were developed as a set of 17 goals (and 169 more specific targets) to address the most important goals that the UN deems that we, globally and collectively, should strive towards for a prosperous and sustainable future (UN, 2015). Four of the 17 goals directly relate to environmental sustainability, and each of the other goals relate to environmental issues at least indirectly. This further demonstrates that even when the climate is not immediately relevant to an issue, it will almost always be related to matters of development and sustainability in the broader sense.

1.1.1. Mitigating Climate Change

Sustainable global, national and regional policies will all be necessary to mitigate climate change, and to adapt to inevitable changes and resulting challenges. By enacting policies that make unsustainable behaviours more difficult, costly or by outlawing them entirely, people will be steered to make greener choices (Van Der Werff et al., 2013). Unfortunately, many environmentally harmful behaviours are very popular (both common and desired) and make passing such pro-environmental policies unpopular. Political parties pushing such restrictive policies that people disagree with are likely to be unpopular and may be met with resistance. This kind of resistance could manifest as reactance, which refers to people actively pushing back against policies that curtail their freedom (Brehm, 1966; Contzen et al., 2021). This phenomenon also arises when an individual or group observes a sustainable innovation or behaviour by an adopter, which can threaten the moral self-concept of observers and lead to defensive reactions (Täuber et al., 2015), which may practically be behaviour that directly opposes or neutralises this threat (Bolderdijk et al., 2018). Examples of this include eating extra meat to spite a vegan (Cramwinckel et al., 2013), or conspicuous pollution in the form of expelling excessive amounts of exhaust from a car to inconvenience and annoy cyclists, a practice known as “rolling coal” (Boissonnet et al., 2022; Daggett, 2018).

There is also an important role that individuals and groups can play facing this global challenge (Stern, 2000). Behavioural choices made by individuals and groups can have a significant impact – both positively and negatively – on climate change (IPCC, 2023; Whitmarsh et al.,

2021). Some of the main ways individuals contribute to their carbon footprint is through behaviours that use up (non–renewable) natural resources, cause pollution or support unsustainable industries (e.g., Thøgersen, 2021). On the flipside, individuals and groups can have a positive effect by supporting circular economies, buying sustainably sourced, produced and long-lasting products, and opting for more sustainable diet, transport and other choices that help to *Reduce Reuse & Recycle* (Geiger, 2020). Making sustainable investments (in the home, for the energy transition, and as a financial opportunity) are other ways people can have a climate impact beyond their daily consumption behaviour. Finally, supporting sustainable public policies at all levels ensures that individuals or groups may influence future behaviours and their consequences, and shape the choice environment available to the population (Sharpe et al., 2021; Thøgersen & Crompton, 2009). In this way, individuals have an almost direct effect on the public policy decisions that are so crucial in the energy transition and climate change challenge.

In an ideal world, people would engage in sustainable behaviours by themselves, so that there would be no need for policy makers to govern such behaviours with incentives and surveillance. Critically, humans increasingly rely on heuristics and are prone to biases when making decisions in a complex world (Thaler & Sunstein, 2008). As such, it is particularly important for the prescribed behaviours to be made as easy as possible, as the path of least resistance is travelled most frequently (Thøgersen, 2021). When sustainable behaviours are not, or cannot be made to be the easiest available option, appeals to people's motivation need to be made.

In the environmental sphere this could mean making sustainable behaviours cheaper and easier or harmful behaviours more costly. Unfortunately, this often requires that governments intervene directly as sustainable products are often more expensive to produce and consume without intervention (Van Der Werff et al., 2013). This makes subsidising sustainable behaviour expensive for government, and also controversial when other causes may require funding. Conversely, making harmful behaviours more expensive through taxation is possible, but may be met with resistance by certain groups (Keizer et al., 2019). Taxing goods and services to reflect their actual total costs including environmental consequences is a way to allow for the market to decide how much a good or service should be consumed when all costs are considered. Nonetheless, this is a complex process of calculation and obviously faces a lot of opposition from the polluting parties (both consumers and producers; Diekmann & Preisendörfer, 2003).

The other reasons why people do or do not engage in sustainable behaviours relates to motivation that is intrinsic. Intrinsic motivation refers to doing things for their own sake, and is often associated with doing things that are satisfying or fulfilling in their own right, rather than from any benefits or consequences from them as a result (Ryan & Deci, 2000b). In the case of environmental behaviours, this definition is often extended to engaging in behaviours for one's own reasons (not including financial or social pressures) as environmental behaviours are generally effortful or time consuming (Van der Werff et al., 2013). This kind of intrinsic motivation is sometimes called obligation-based intrinsic motivation, and implies a behaviour can still be intrinsically motivated because of a self-imposed obligation to engage in the behaviour. This is related to the motivation based on what people find to be personally important, or what may be called personal norms (Thøgersen, 2006).

Another source of influence to make people adjust their behaviour in sustainable ways is through social norms (Bicchieri, 2017; Thøgersen, 2006). Social norms are the kind of social influence that arises from observing what is commonly done and accepted by other people. In this way, trends can snowball and have large significant effects on an entire population. If social norms can fill the gap in already existing motivation to be sustainable, then this could avoid the need for policies and institutional governance structures to police and punish behaviour. It is precisely this combination of factors taken together that inspired this PhD project.

Before discussing the theoretical concepts that are central to the project in more detail, we briefly introduce the context in which the project was developed and the framework in which it was carried out.

1.2. The PhD Project

This project was originally conceived and funded by the Sustainable Cooperation (SCOOP) consortium. The project that this PhD thesis is the culmination of was originally titled "Group Norms, Intrinsic Motivation and Sustainable Energy Consumption" and was designed as a transdisciplinary project involving social psychology and philosophy. By standing on the solid foundation of two giants' shoulders in terms of their theories, rigour and application to societal issues, the idea is to build beyond what could be achieved by a single discipline by stimulating cross-pollination between the established fields.

1.2.1. What's the SCOOP: A Sustainable Cooperation Consortium

The SCOOP consortium, established in the Netherlands in 2017, is "dedicated to the interdisciplinary study of sustainable cooperation as a key feature of resilient societies" , (SCOOP, 2020, 2023). These are precisely the societies that would be able to deal with the challenges highlighted by the Sustainable Development Goals, and many of the (PhD) projects borne out of SCOOP are dedicated specifically to one of those sustainable development goals. A core idea of all SCOOP projects is to approach a societal issue from two of the following disciplines: social psychology, philosophy, sociology and history. The focus on interdisciplinarity is key as it highlights the need for tackling complicated and complex issues not just from one perspective, but marrying the theories, methodologies and insights from multiple disciplines.

The SCOOP framework, shown below in Figure 1-1, shows how through cooperation, societal challenges can be resolved or tackled to lead to sustainable value creation. What sustainable value creation means depends on the context required by a project, and in the case of this project pertains mainly to societal environmental sustainability. This value creation is especially necessary in the face of the three sustainability threats: external shocks, spill-over effects and feedback loops. Behavioural theories (focusing on identities, goals and networks) may foster the development of cooperation, or how cooperation leads to sustainable value creation in different institutions (care, inclusion, work) may play a role in facilitating this cooperation.

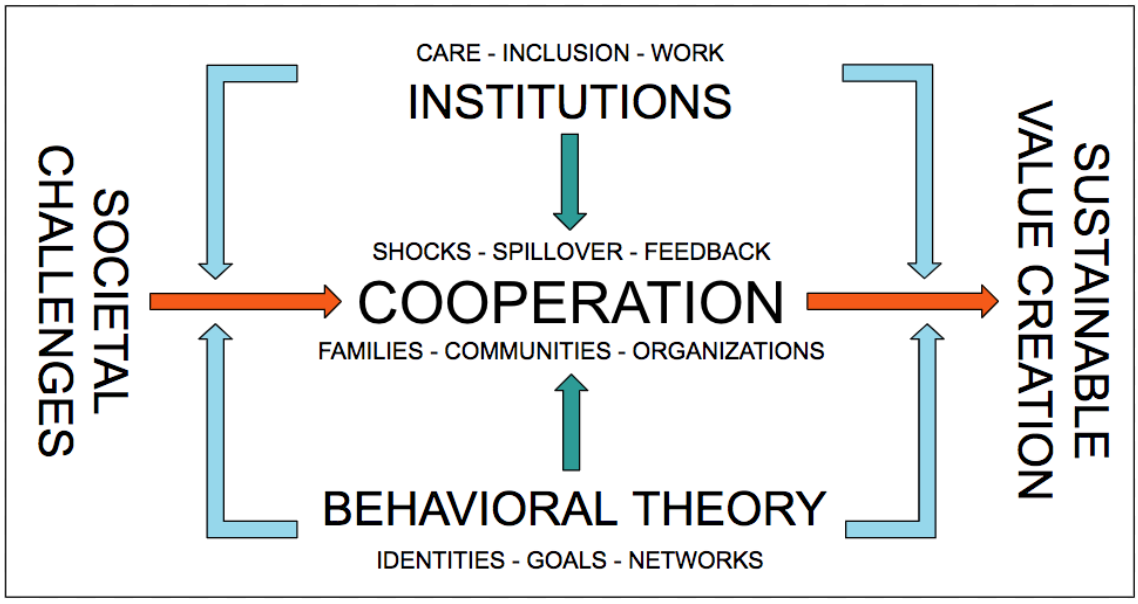


Figure 1-1: SCOOP Theoretical Framework

Generally, the SCOOP model focuses on the *meso* level, which considers groups—like families, communities and organisations—rather than individuals (the micro level) or societies at large (the macro level; SCOOP, 2020). It is at this *meso* level that has largely been ignored, that cooperation is also necessary, and through this *meso* level that societal challenges should also be researched and targeted. Neither individuals, nor national policies and legislation alone, can foster an environment for sustainable value to be created, and maintained resiliently. Given that the empirical studies of this PhD project are conducted in a social psychological setting and design, we measure what individuals' responses are to questions about their personal norms, motivations and behaviours, and those of their groups.

This project, the core starting point of this PhD, is project 11.2, which falls under the behavioural theory of Identities, the work package of Theory Synthesis, and the sustainability threat of *spill-overs*. Although the behavioural theory is focused on identities, and this is central to the main thesis, the idea of (shared) goals also features clearly in the analysis. As the work package Theory Synthesis suggests, the focus is on integrating and synthesising theories and literature from different perspectives; in this case psychology and philosophy, but also combining the different theories focusing on motivation and identities. This also means that, generally, the insights gained from the synthesis could be applied to a range of approaches, not limited to our focus of environmental sustainability. The results and insights of the dissertation will be applied to the SCOOP framework in the general discussion (Chapter 5).

1.2.2. Aim of the Project

Over the course of this project, we[1] examine whether more sustainable and cooperative patterns of energy consumption and behaviour can be driven by group concerns that are intrinsically and/or autonomously motivated, transcending the need to impose (socially and economically) costly forms of incentives or surveillance.

1.2.3. Research Design

This project will develop and test theory integrating intrinsic motivation with autonomy associated with group membership, and combine survey experiments with philosophical analyses. The philosophical literature on intrinsic values and autonomy will be used to give

[1] I use 'we' instead of 'I' throughout the dissertation to refer to the authors not just as myself, but as a collaboration between myself and my supervisors, Dr. Russell Spears and Dr. Frank Hindriks.

further content to the notion of intrinsic motivation and underscore why, in fact, we choose to focus on what we call autonomous motivation. In experimental studies we investigate the conditions under which membership of certain groups and the salience of the norms held in these groups promote sustainable energy behaviour that may be linked to individual costs (e.g., reduced comfort or increased price), creating a social dilemma. Level of identification with the group, identity content, group norms, the extent to which choices are made voluntarily, ambivalence and ease or difficulty of behaviours will be measured or manipulated. A further factor concerns the relation between group identification and autonomy: group identification can be either supportive of or detrimental to self-determination (autonomous decision-making is valuable in itself). Normative analysis will be used to shed light on the impact it has on the moral quality of the choices people make.

1.3. Key Concepts

The following section briefly outlines the concepts that are critical to the PhD project and introduces how they relate to each other. We introduce social norms, intrinsic and extrinsic motivation, the self and identities, and autonomy.

1.3.1. Social norms

Social norms are unwritten rules that guide behaviour within groups and societies (Bicchieri, 2017). They represent the shared expectations and standards that individuals are expected to follow. The interplay between motivation and identity finds its intersection within social norms. Intrinsic motivations aligned with personal values and group identities often drive individuals to adhere to these norms, as doing so maintains their sense of autonomy and belonging. People may behave in line with a social norm for a variety of reasons, ranging from group acceptance (in order to be accepted by a group) to private acceptance (because a person genuinely agrees with a norm; Cialdini & Goldstein, 2004).

One way that scientists and policy makers have attempted to understand and stimulate behaviour change has been through the use of social norm interventions. Social norms are generally split between descriptive norms which describe what is commonly done, and injunctive norms which describe what is generally deemed appropriate or accepted (Cialdini et

al., 1991). Both types of norms can be used to stimulate behaviour by making people aware of others' behaviours or their attitudes. This reflects the direct and external influence that norms have, but this does not include a full account of the identity-based influence that norms can have, which is what makes norms internalisable (see Section 1.3.3 on Group Identities; Spears, 2021; Turner, 1991).

1.3.1.1. Descriptive norms

Descriptive norms have been shown to influence household energy consumption behaviour. One meta-analysis of 600,000 households showing a decrease in energy consumption of 2% on average for descriptive norm interventions (Allcott, 2011). Although norms are generally indicative of behaviour and can be used to promote behaviour, it is important that the norms people are subjected to are perceived as being normative within what they consider to be their group. As long as people feel comfortable within that group in which the descriptive norm exists, it often makes sense to follow the behaviour of the herd, not just to avoid being ostracised, but also because it serves as a mental shortcut to inform what might be a plausibly reasonable way to act (Cialdini et al., 1991). However, a descriptive norm of a group that an individual does not associate or identify with may actually lead to reactance as well, because they may want to distance themselves from this group, and demonstrate this by behaving differently (Kavvouris et al., 2020; Schultz et al., 2007).

1.3.1.2. Injunctive Norms

Injunctive norms are sometimes even more effective at changing behaviour in a population than descriptive norms (Bonan et al., 2020; Cialdini et al., 1991). This is precisely because where descriptive norms lack any sense of ought or should, injunctive norms serve as a normative guide of behaviour by illustrating the moral rules of a group (Cialdini et al., 1991). Injunctive norms are often associated with both positive and negative social sanctions, and therefore more likely to be influenced by how much value is placed on garnering social approval and avoiding social disapproval (Cialdini et al., 1991; Kuppens et al., 2020). For this reason, it is again important that individuals that are subject to an injunctive norm care about their approval by and within a group for these injunctive norms to be effective. At the same time there is also some disagreement within the scientific community as to how explanative injunctive norms are, and how they can work when multiple conflicting such norms may also exist at the same time, such as the norm to 'mind your own business' as well as to help someone in need. As a result, this

still requires individuals to make contextual judgments in each situation to inform their decision. This makes injunctive norms important within societies and helps them remain civil, but more difficult to use as a mental shortcut for decision making (Bertoldo & Castro, 2016; Schultz et al., 2007).

1.3.2. Motivation

For any voluntary behaviours to be engaged in or performed, there must generally be some kind of motivation to do so. Of course, not all behaviours are voluntary, and indeed motivation is not necessary for instinctual, reflexive or forced behaviours (Wood & Rünger, 2016). There are different kinds of motivation that can arise from different sources, ranging from the selfish, the selfless and the social (Van Zomeren, 2016). Some behaviours are performed instinctively, or automatically, whereas others are performed consciously and deliberately. It is generally the latter type of behaviour that we are interested in studying (and particularly the motivation that precedes it).

In order for behaviour to be performed sustainably, without any surveillance or the presence and threat of authority, it seems necessary that people are intrinsically motivated. Some research posits that intrinsic motivation requires the absence of instrumentality (the behaviour is an end in itself; e.g., Ryan & Deci, 2000a) whereas other literature stipulates that intrinsic motivation necessitates hedonic gratification (pleasure or satisfaction; e.g., Green-Demeirs et al., 1997; Pelletier et al., 1998). Rather, at the most basic level, we believe that being intrinsically motivated to do something implies that the reason for doing so is internalised and the decision to engage in something is made autonomously. It is because we tend to favour ideas of autonomy rather than focus on hedonism or instrumentality, that we will move away from the established concept of intrinsic motivation, in favour of autonomous motivation (see Chapter 2 for a more in-depth discussion). In order to understand what intrinsic motivation is, however, and how scholars and politicians have come to understand it today, it is useful to take a step back and investigate where the notion of intrinsic motivation originated.

1.3.2.1. Compliance vs. conformity

In the realm of social psychology research, compliance and conformity are distinct concepts that refer to different ways in which individuals respond to norms as social pressure (experienced as

external to the self), and true social influence (experienced as internal to the self), respectively. While each process has the outcome of adjusting behaviour in line with others, they arise from different psychological mechanisms and have unique implications.

Compliance refers to a type of social influence where an individual outwardly changes their behaviour in response to a direct request or command from another person or group (Deutsch & Gerard, 1955). Compliance often occurs when an individual agrees to a specific request, not necessarily because they have been convinced or persuaded, but because they want to avoid confrontation, gain a reward, or adhere to social norms for extrinsic reasons (Asch, 1956; Deutsch & Gerard, 1955; Kelman, 1958). This type of influence is often short-term and does not necessarily reflect a change in the individual's personal attitudes or beliefs. For instance, agreeing to participate in an environmental protest because a friend asked you to, despite being indifferent about the cause, illustrates compliance.

Conformity, on the other hand, involves adjusting one's behaviour or beliefs to match those of a group or social norm and reflects genuine social influence through private acceptance (Spears, 2021). Conformity can lead to a change public behaviour, but is typified by a change in private attitudes, as individuals internalize the group's perspective as their own, changing their beliefs while maintaining a sense of belonging (Cialdini & Goldstein, 2004). An example of conformity is changing one’s attitudes to environmental policies or dietary preferences to be in line with the rest of one’s group and maintaining this diet or beliefs in the absence of the group. This would constitute private acceptance, or true influence (Spears, 2021; J. C. Turner, 1991)

In summary, compliance focuses on responding to direct requests or commands to gain rewards or avoid punishment, often without a genuine change in attitude. Conformity, on the other hand, involves changing one’s beliefs to align with group norms. Both compliance and conformity highlight the intricate ways in which individuals navigate social pressures and the impact of group dynamics on their decision-making and behaviour (Cialdini & Goldstein, 2004). While compliance is seen as very extrinsic influence, conformity can lead to varying degrees of true influence, actually changing a person, rather than just a single behaviour (Spears, 2021).

1.3.2.2. Self-Determination Theory

Self-Determination Theory (SDT), proposed by Deci and Ryan (1985), underscores the significance of intrinsic motivation and internalization in driving behaviour. SDT posits that individuals have innate, basic psychological needs for autonomy, competence, and relatedness.

When these needs are satisfied, individuals are more likely to exhibit intrinsically motivated behaviour, where actions are fuelled by a sense of choice and personal volition.

Internalization, a key concept in SDT, refers to the process of adopting external motivations and integrating them into one's sense of self, as one's own (Kelman, 1958). This means that what may have started as a behaviour exhibited as simply complying to a group to become part of the group, this group identity has become a part of one's own identity. Similarly, the values of the group have become part of the individual through the process of internalisation. Once a belief or norm has become internalised, even if the original source of the norm or belief changes, an individual may choose not to adjust their behaviour to conform with the new norm, as the internalised norm is a rooted part of their self. This internalization can turn extrinsic motivations (such as compliance) into increasingly more autonomous forms, aligning behaviours with personal values and interests. Therefore, SDT highlights how the interaction between intrinsic and extrinsic motivations shapes behaviour by influencing the degree of autonomy and internalization. More details on the workings of SDT and how our theoretical models differ from the theory are developed in Chapter 2.

1.3.3. Self and Identities

Identity is a multifaceted construct encompassing personal and social components. Traditional psychological notions of the self, such as the dual process model of normative influence (Deutsch & Gerard, 1955), described groups as external to the self. The social identity approach offers a new understanding that is still at the fore of the social influence literature today (Spears, 2021). People categorize themselves and others based on shared or distinct attributes, which can lead to in-group favouritism and out-group bias inter alia (J. C. Turner et al., 1979). This sense of belonging to certain social categories influences attitudes and behaviours towards individuals in and outside one's group. Personal Identity refers to an individual's unique attributes, experiences, and characteristics. In traditional theories of the self, it forms the basis of the self-concept, helping individuals differentiate themselves from others. However, just as different social identities may become salient in different intergroup contexts, people may have different personal identities, depending on the context and situation. Each of these different components of identity are relevant for the interplay between norms and motivation.

1.3.3.1. The Social Identity Approach

Social identity theory (Tajfel, 1978; Tajfel & Turner, 2004) introduced the idea that social identities are integrated into the self-concept and explain intergroup processes. Self-categorisation theory (J. C. Turner, 1991) further claims that different contexts and environmental cues make certain categories more salient and inform the relevant identity. It also made more explicit the distinction between personal and social identities or self-categorizations. Together, these two theories comprise what is known as the social identity approach. In principle, a group identity is experienced just as authentically as a dimension of self as (a) personal identity.

The social identity approach, and self-categorisation theory (Turner, 1991) in particular, asserts that people tend to identify with groups and subsequently revise their identity with respect to this group (Neys et al., 2014). This theory supposes that individuals define themselves as a collection of (integrated) identities derived from the different categories or groups that they (feel they) belong to. Through assimilating their identity with a certain group that one has identified with, people freely adopt certain norms, values, and behaviours as their own, and will continue to exhibit and sustain these, as conforming to them serves to validate one's membership of a group (Tajfel & Turner, 2004). The influence from this type of self-categorisation is experienced as informational (trusting the group norm as truth) and as true influence, and therefore coined referent informational influence (Spears, 2021; Turner, 1991).

In sum, in the self-categorization literature, personal identity, and social/group identity are central constructs that help us understand how individuals perceive themselves and relate to others within the social context. These concepts are interconnected and contribute to shaping an individual's sense of self and their interactions with various social groups.

1.3.3.2. Personal identity/identities

Personal identity pertains to an individual's unique and distinct characteristics that differentiate themselves from others, and the sense of self that derives from this. It encompasses personal traits, experiences, values, and beliefs that contribute to an individual's sense of individuality (Hogg & Turner, 1985; J. C. Turner, 1991, 2010). It is through personal identity that individuals define themselves in terms of their intrinsic attributes and personal achievements. While personal identities are important to a person's self-concept and may drive a lot of their

behavioural choices, a lot of a person’s identity and behaviour is also shaped by others through social identities.

1.3.3.3. Group identity/identities

Group identity refers to a person's sense of belonging and attachment to a specific group. This could range from small-scale groups like family or friendship circles to larger social categories like nationality or religion. Group identity is crucial in shaping an individual's behaviours, attitudes, and social interactions. It can provide a source of pride, support, and a basis for shared values and goals.

But as self-categorization theory (Turner, 1991) made clear we can self-categorize in increasingly inclusive groups, up to and including the human at the superordinate level. Indeed, much influence is implicitly premised on a shared understanding of what it is to be human, and the expectation of common agreement on basic issue of perception that goes with this. Some matters of morality, justice (fairness) and integrity can be attributed to people identifying as a human, with all other people in that common group identity, and therefore behaving in a way that presumes some similarity or familiarity.

In essence, personal identity, social identity, and group identity are intertwined components of how individuals perceive themselves and their relationship to the broader social world. Self-categorization theory highlights that these identities are not fixed but are context-dependent and can shift based on the salience of different social categories in a given situation. This theoretical framework provides valuable insights into how individuals navigate their self-concept, interact with various social groups, and contribute to the complex fabric of social identity and group dynamics.

Group identification in social psychology refers to the extent to which an individual feels a sense of belonging, attachment, and connection to a specific social group (Leach et al., 2008). It is the degree to which someone sees themselves as a member of that group and considers that group to be an important reference group for who they are in general or in specific contexts. This identification can depend on a variety of factors, such as how relatively important this group is to an individual’s self (concept) in general, and contextual factors, or prompts that makes a group membership more salient. Additionally, some people are also quicker to ascribe value to their group memberships, and see group memberships as more meaningful than other people (Kuppens et al., 2020).

Individuals who strongly identify with a specific group (consider this group as a relatively more important or integral part of their self) are more likely to adopt the norms, values, and behaviours associated with that group (Spears, 2021). It is for this reason that group identification is often understood as a moderator, indicating that changes in certain variables (like changes to a group norm) will see a greater change in behaviour for people who strongly identify with the group than people who weakly identify with the group.

The concept of group identification is closely linked to social norms. Social norms are the unwritten rules and expectations that guide behaviour within a society or group. These norms define what is considered appropriate and acceptable behaviour in various situations. Group identification can influence how individuals perceive and adhere to social norms. Just because an individual identifies with a group, however, does not mean that they automatically must agree with each norm and act accordingly (Packer, 2008). Even strong identifiers may sometime defect from group norms to preserve their autonomy, and critically, to steer the group in a direction they see fit as a group leader would. It is in this way that groups change and different norms may become more prototypical of a group over time.

While identification with a group can influence an individual's behaviour, groups are also capable of establishing and maintaining collective action, behaviour undertaken by the group that may be impossible or ineffectual when engaged in by an individual acting alone. The social identity model of collective action (SIMCA; van Zomeren et al., 2008) demonstrates the importance of social identity in predicting collective action. This model was adapted to the case of pro environmental behaviour as the social identity model of pro-environmental action (SIMPEA; Fritsche et al., 2018) modelling sustainable collective action, such as activism as well as private everyday behaviours.

It has been hypothesized that one of the factors that leads to identification with socially relevant prescriptions is an affective tie with significant others (Connell & Ryan, 1989), and identification is thus expected to correlate with a feeling of relatedness and group relations. This suggests that although the conceptualisation of identification in the social identity approach is different to the concept of identification in self-determination theory, these concepts significantly overlap and may indicate the possibility to integrate these two meta-theories beyond what is conventionally done. This integration of self-determination theory and social identity theory, leading to a group level self-determination theory has been addressed by Amiot, Louis and Thomas (2017) in their model on the internalization of normative social harm-doing. As Amiot

and colleagues have already introduced the plausibility of a model of internalized behaviour at a group level (see also Amiot et al., 2012), we explore this type of integrative possibility by taking a closer look at the shared core component of each of these theories: autonomy.

1.3.4. Autonomy: an internal motivational speaker

While people are often influenced by external sources, people also value feeling that they are making the eventual decisions autonomously, that is to say that they are in control of their own behaviour (Dworkin, 2015). In fact, not only is autonomy linked to improved well-being, but also to behaviour being more sustained as it feels more authentic and self-imposed (Ryan & Deci, 2000b). Although there is some debate as to whether or not autonomy should be regarded as an intrinsic value in its own right (for discussion, see Sumner, 1996), it is generally regarded as a precursor and requisite for all other values (Gillon, 1985). There are many ways to understand and study how autonomous people actually are and how they perceive their own autonomy. In fact, the intricacies and particularities about different understandings of autonomy warrant a deeper discussion and a taxonomy (see Chapter 2).

Another critical difference between understandings of autonomy that also pertain to social identities, is the role of social influence versus individuality. Some understandings of autonomy presuppose a freedom from any influence, whereas other conceptions may see true social influence as an internal process to the self, and therefore not in conflict with being autonomous. This will be discussed in more detail in the following chapter, which is dedicated to understanding autonomy and autonomous motivation, specifically in their roles in explaining sustainable (environmentally friendly) and sustained (maintained over time) behaviour.

1.4. Structure of the dissertation

In this PhD dissertation, we investigate how group norms of sustainability can be internalised to be experienced as autonomously motivating and lead to sustainable behaviour. We will aim to answer the main thesis in three parts: a conceptual analysis, a scale development and experimental studies.

Chapter 2 will present a conceptual analysis of the main themes of the thesis: group norms, autonomy, and intrinsic (or rather autonomous) motivation. We will synthesise the insights from this analysis into a conceptualisation of three main understandings of what it means to be autonomously motivated.

Chapter 3 of this thesis features the development of a psychological scale. To do this, we bring together the insights from the first chapter and build upon them to create an empirical psychological scale to measure the different understandings of autonomous motivation. This scale will be refined and used to also analyse if the theoretical differences and intricacies of the different understandings are distinguishable, as well as if and how these differences are relevant correlates for the prediction of behaviours and other psychological measures such as people's values, and, importantly, personal and group norms.

The final empirical chapter (Chapter 4) concerns experimental trials to further test the psychological scale we developed in the second chapter by using psychological manipulations to test whether it is possible to influence people's behaviour by targeting what people are autonomously motivated to do. We will present three studies sampling from different populations, and targeting different independent variables to influence similar outcome variables pertaining to petitioning and commitment devices, behavioural intentions and policy support regarding environmental behaviours related to (lab grown) meat consumption, recycling and nuclear power.

We end the dissertation with a general discussion in which we bring together all the insights from the former chapters and present our conclusions. We discuss the relevance of these insights for future research and policies at different levels of governance and what the implications may be for different people with different beliefs and motivations.

2. Conceptual Analysis of Autonomy and Motivation

Abstract:

While self-determination theory offers a widely accepted understanding of intrinsic motivation, its emphasis on pleasure and enjoyment overlooks the potential for intrinsic motivation driven by social influence. To address this gap, the concept of autonomous motivation is introduced, prioritizing autonomy over pleasure as the key requisite for internalisation. This conceptual chapter of the thesis provides a theoretical framework for autonomy and the motivation it leads to, drawing from competing philosophical understandings of autonomy. In so doing, we integrate self-categorization and the legitimacy of norms into authentic motivation.

Existing psychological scales measuring autonomy lack the scope to incorporate a group dimension of the self, and thus, autonomy. Drawing from philosophical concepts including the Kantian Categorical Imperative, the Razian Concept of Self-Authorship, and the Frankfurtian idea of Hierarchy of Desires, this chapter delineates three critical components of autonomy to understand autonomous motivation: Self-Governance, self-authorship, and Volitional Resolve. This conceptual framework lays the groundwork for future studies to develop a comprehensive scale for measuring autonomous motivation, thereby enhancing our understanding of sustainable behaviour.

By bridging psychological and philosophical perspectives, this research not only contributes to advancing psychological theory but also provides insights into how individuals experience autonomy in their behaviour, thereby informing philosophical discourse. Ultimately, this interdisciplinary approach has the potential to foster a deeper understanding of the complex interplay between group norms, motivation, and sustainable behaviour, offering valuable implications for both theory and practice.

2.1. Introduction

There are different ways of conceiving of intrinsic motivation, and most conceptualisations would agree that people should choose to do what they do, and would choose to do so in the absence of instrumental costs or rewards (Deci & Ryan, 1985). Especially within the discipline of social and motivational psychology, intrinsic motivation has increasingly been praised over the last decades, claiming that when people act from a place of intrinsic motivation, this behaviour is generally more sustained and does not need to be stimulated with incentives (Deci & Ryan, 1985). Conversely, extrinsically motivating people (where motivation comes from outside the individual, rather than from within) can be costly as incentivisation or surveillance is often required (Milovanović, 2020). Moreover, it has been suggested that if people are intrinsically motivated to behave pro-environmentally, they are also more likely to support policy in line with those behaviours (Sharpe, 2022; Thøgersen & Noblet, 2012).

There is significant value in understanding and subsequently fostering intrinsic motivation. However, there is some debate as to what exactly intrinsic motivation is, where it comes from, how to measure it, and which factors predict it. Self-determination theory has posited that autonomy is fundamental to intrinsic motivation (Deci & Ryan, 2000), however it is not entirely clear what is meant with autonomy in this literature. What autonomy refers to, what types of thoughts and considerations it is based on, where it comes from, and why it is critical, are all fundamental questions that are important to have clear answers to, especially given that the concept of autonomy is at the centre point of a theory like self-determination theory.

Furthermore, operationalisations of intrinsic motivation have focused on enjoyment and pleasure as the basis of the most intrinsic form of motivation (Pelletier, Nortel, et al., 1998), but environmental behaviours (such as switching off the lights when leaving a room) are often not enjoyable on their own, but only insofar as they signal being an environmental person, which can feel good (Venhoeven et al., 2016). It is for this reason that we choose to explore the role that autonomy plays in motivation (what we will call autonomous motivation) and contrast this to intrinsic motivation.

Autonomy has not only been studied in the context of (social) psychology, but has also been a subject of debate in philosophy since the enlightenment period (1685-1815; Christman, 2020). In this chapter, we will explore the conceptualisation and operationalisation of intrinsic motivation, focusing particularly on the role of intrinsic motivation and autonomy. We will do this

by attempting to synthesize some of the key insights that have arisen from the vast work that has been done by philosophers to explicate autonomy, and by exploring the consequences these conceptions of autonomy may have for intrinsic motivation as it is generally understood in psychological research.

By integrating the insights from philosophy and psychology in this way, we propose that both psychology and philosophy can build on one another, or at least that one discipline may benefit from the extensive work that has been done in the other. As psychology is a far younger discipline, it should build on the arguments and advances from philosophy, and may benefit from certain insights which may not have arisen in psychology alone due to the methodological differences of investigation. Having a better understanding of autonomy and, thus, intrinsic motivation may help develop better measurement methods, which in turn, can be useful for intervention and policy design. Simultaneously, perhaps some of the stalemates that have arisen in philosophy may be resolved, or nudged out of a deadlock after the different schools of thought have been subjected to empirical testing using psychological methods.

At its core, this chapter posits the question of how different philosophical conceptions of autonomy may inform our understanding of intrinsic motivation. The short answer to this question is that there are different ways to conceive of autonomy in philosophy, and examining these have led to the formulation of three (and with a further subdivision, four) predominant conceptions that I will focus on. Each, in its own way, comes to different conclusions about intrinsic motivation. By its nature philosophy typically eschews multiple conceptualizations and ideally aims for a single correct one. Psychologists, however, are generally more receptive to the idea that different people might conceive of autonomy in different ways, and, as such, may be intrinsically motivated by different things. Additionally, psychology can also be used to empirically assess the validity of different conceptualizations from philosophy and whether or when they may be valid. One of the key contributions that we hope to make in this way is to pave the way for future research to empirically investigate autonomy and its relation to intrinsic motivation more comprehensively. This move towards a more pluralistic understanding of autonomy also makes way for introducing a form of intrinsic motivation that could emanate from a group through internalisation of group held norms.

In order to investigate intrinsic motivation and the role of autonomy adequately, the rest of the chapter will be structured as follows: The first section will review the seminal literature on intrinsic motivation; identify key insights from the self-determination theory literature and social identity approach; and propose conceptual inconsistencies or points that we disagree on. In the second section we will focus the investigation more by investigating why autonomy is said to be so crucial to intrinsic motivation and how autonomy supposedly relates to intrinsic motivation. Section three will explore the different conceptions of autonomy in the psychological and philosophical literature, leading to the formulation of the three types of autonomy that we synthesize from the literature. Section four will address the similarities and differences between the resultant conceptions of autonomy, and discuss whether these may be integrated, or will necessarily conflict. Section five will attempt to summarize the implications of autonomy on intrinsic motivation in the way we conceptualise autonomy here, both with regard to individuals' behaviour and on a *meso*-level of analysis. We conclude with some comments about how the incongruence between the different forms of autonomy may be investigated empirically, and feed back into the philosophical discourse and psychological theory.

2.2. Intrinsic Motivation

In order for behaviour to be performed sustainably, without any surveillance or the presence and threat of authority, it seems necessary that people are intrinsically motivated. Some research posits that intrinsic motivation requires the absence of instrumentality (Dorsey, 2012; Ryan & Deci, 2000a, 2000b) – the behaviour is an end in itself – whereas other literature stipulates that intrinsic motivation necessitates hedonic gratification – pleasure or satisfaction (Pelletier, Nortel, et al., 1998). Rather, at the most basic level, we believe that being intrinsically motivated to do something implies that the reason for doing so is internalised and the decision to engage in something is made autonomously. In order to understand what intrinsic motivation is, and how scholars and practitioners have come to understand it today, it is useful to take a step back and investigate where the notion of intrinsic motivation originated. In Edward Deci's original (1975) exploration of intrinsic motivation, he highlights the metamorphosis that the understanding of motivation and particularly intrinsic motivation has gone through.

Woodworth proposed that an activity can be initiated by an extrinsic motive but that "only when it is running by its own drive ... can (it) run freely and effectively ... " (Woodworth, 1918, p.70). Allport (1937) aptly named this notion that activities can develop an intrinsic interest, irrespective of the original motivation *functional autonomy*. Many animal studies showed that exploration may be intrinsically rewarding. Some decades later, Koch (1956) highlighted that someone may become fully absorbed by and committed to something, even going so far as to suppress basic bodily desires such as hunger or fatigue. This description of intrinsic motivation, which seems to have clear links to the theory of flow (e.g., Csikszentmihalyi, 2014), reignited the search for explaining intrinsic motivation, which started with *drive theory*.

Theories about drive were soon found to be inadequate as, even when modified to allow for *optimal arousal*, this would remain insufficient "since there is no deficit in body tissues, nor persisting stimulus" (Deci, 1975, p.31). Theories of drive (e.g., Butler, 1953; Montgomery, 1954) were replaced with theories of optimal incongruity, optimal arousal, and finally, motivational theories of competence and self-determination (Angyal, 1941; Deci, 1973). This last development, spearheaded by Deci and colleagues (e.g., Deci, 1973, 1975; Ryan & Deci, 2017) has made its way to the foreground of intrinsic motivation research and is currently still dominating the study of intrinsic vs. extrinsic motivation.

2.2.1. Self-determination Theory

Self-determination theory is compelling for a number of reasons, perhaps most so because it seems to envelop all former theories, and comprehensively explains different types of motivation along an intuitive continuum. At the core of this (meta) theory is the idea of the three basic human needs: competence – “a propensity to have an effect on the environment” –, relatedness – “the desire to feel connected to others” – and autonomy – “the organismic desire to self-organize experience and behaviour and to have activity be concordant with one’s integrated sense of self” (Deci & Ryan, 2000, p.231). The satisfaction of each of these (to some extent) is said to be necessary for someone to experience self-determination or intrinsic motivation. Controlling, overly challenging and rejecting environments are thus not conducive to intrinsically motivated behaviour.

Assuming that at least a basic level of relatedness and competence are experienced, autonomy is suggested to be a key determinant of the type of motivation that will be displayed. In the diagrammatic representation of SDT’s continuum of motivation (in Figure 2-1, below, adapted from Deci & Ryan, 2000, p.237), we see that motivation ranges from amotivation, through four different types of extrinsic motivation, and finally to intrinsic motivation.

SDT recognizes that extrinsically motivated actions can become self-determined as individuals identify with and fully assimilate their regulation (Ryan & Deci, 2000a). For example, as one’s regulatory style (where the motivation for behaviour comes from) changes from non-regulation to external regulation, amotivation (unwillingness regarding the behaviour) may turn into extrinsic motivation, where one’s behaviour is guided by external rewards and punishments. Regulation may become introjected if an external regulation or value has been "taken in" and is now enforced through internal pressures such as guilt, anxiety, or related self-esteem dynamics (Connell & Ryan, 1989). Identified regulation refers to behaviour that is considered to be of personal importance, something that is consciously valued – behaviour that one would like to be considered as in line with who they are (Ryan & Deci, 2000b, 2000a). Next, and the final form of extrinsic motivation is that of integrated regulation, which is to say that this behaviour or the values associated with these behaviours are synthesized within the self, and are brought into congruence with one’s other values. Finally, any behaviour that is performed for the sake of the inherently interest and satisfaction that one has in the behaviour, or for the enjoyment which the act itself gives, is what is considered intrinsic motivation, and requires complete internalization.

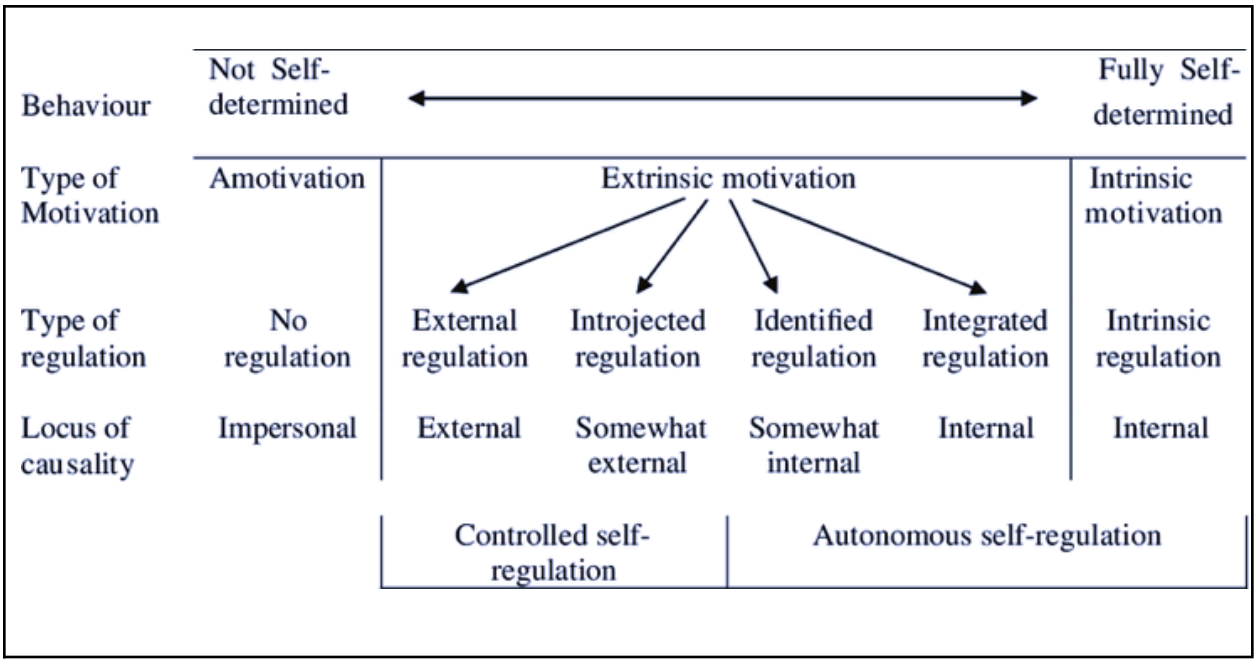


Figure 2-1: Self-Determination Theory of Motivation Continuum

2.2.2. Internalisation

A key concept related to behaving autonomously, self-determined or from a place of intrinsic motivation is *internalisation*. The more internalized a value or regulation, the more it is experienced as subjectively located closer to the self (Deci et al., 1989). There are many advantages to having higher levels of internalization (Grolnick et al., 1997), and these include "more behavioural effectiveness, greater volitional persistence, enhanced subjective well-being, and better assimilation of the individual within his or her social group" (Ryan & Deci, 2000b, p.73).

As certain beliefs become internalised, the locus of causality (where a behaviour originates from) can go from being impersonal (having nothing to do with oneself), or external (when someone or something else is driving the behaviour) to internal, when the decision to exhibit a behaviour comes from within. In this way, rather than complying to some authority, an individual can assimilate to a norm and conform to this norm without any sense of an external party determining their behaviour. Self-determination theory suggests that an individual needs a sense of relatedness to others to feel supported and fulfilled, but must act independently to be self-determined and to be intrinsically motivated (Ryan & Deci, 2000a). Yet, this is not the only

way to conceive of autonomous behaviour. In fact, we call into question whether it is ever possible to act entirely on one's own, when an individual is a part of a society that has norms and institutions entrenched in its fabric. Freely and autonomously assimilating to a group or a norm held within a group is a process that is particularly central to a different meta-theory in social psychology, the Social Identity Approach.

2.2.3. Social Identity Approach

Social Identity Theory introduced the idea that valued group identities can form a part of the self-concept (Hogg & Turner, 1985). Self-Categorisation Theory took this a step further, suggesting that people have different self-categorisations depending on the group identity that is salient at any one time (Tajfel & Turner, 2004). This theory supposes that individuals define themselves as a collection of (integrated) identities derived from the different groups (that they feel) they belong to. Through assimilating their identity with a certain group that one has identified with, people freely adopt the groups norms, values, and behaviours as their own. Because the group is experienced as the self, they will continue to exhibit (sustain) these, as conforming to them serves to validate one's membership of a group, which is to validate their own identity (Neys et al., 2014).

It has been hypothesized that one of the factors that leads to identification with socially relevant prescriptions is an affective tie with significant others (Connell & Ryan, 1989), and identification is thus expected to correlate with a feeling of relatedness and group relations. This suggests that although the conceptualisation of identification in the social identity approach is different to the concept of identification in self-determination theory, these concepts significantly overlap and may indicate the possibility to integrate these two meta-theories beyond what is conventionally done. This integration of self-determination theory and social identity theory, leading to a group level self-determination theory has been successfully done by Amiot et al. (2017) and Amiot & Louis (2011) in their model on the internalization of normative social harm-doing. As Amiot and colleagues have already introduced the plausibility of a model of internalized behaviour at a group level (see also Amiot et al., 2012), we would like to explore this type of integrative possibility by taking a closer look at a core component of each of these theories, namely autonomy.

2.3. Autonomy

The term autonomy was first used in relation to the independence and self-sufficient self-rule of the city states of ancient Greece, but soon the idea captivated the stoic philosophers who thought about the role that self-rule plays in an individual's life, what it means, and the desirability thereof. Clearly, autonomy is of paramount importance in the study of individual and group level motivation, given that "most of the research on the effects of environmental events in intrinsic motivation has focused on the issue of autonomy versus control [by others]" (Ryan & Deci, 2000b, p.70). While self-determination theory does generally focus on hedonic intrinsic motivation, autonomy is a critical requirement of intrinsic motivation, so it is also of significant importance to the theory.

Nowadays, autonomy is used in an exceedingly broad fashion. It is seen as a form of positive liberty (Berlin, 2017). It is also equated with self-rule or sovereignty. Furthermore, it is closely related to freedom of the will, dignity, integrity, individuality, independence, responsibility and self-knowledge as well as with qualities of self-assertion, critical reflection, freedom from obligation, absence of external causation and knowledge of one's own interests. One commonality between definitions of autonomy is that it is always deemed a feature of persons and that it is a desirable quality to have (Dworkin, 2015). Autonomy is generally not regarded as a virtue, but as a prerequisite for all virtues (Gillon, 1985). In particular, we are interested in exploring and synthesising the different conceptualizations of autonomy that exist in social psychology and philosophy in an effort to establish a more coherent and complete picture of autonomy when considering the possibility of group level autonomous behaviour, or group level self-determination (Amiot & Louis, 2011; Thomas et al., 2017).

By exploring the different psychological and philosophical conceptualisations of autonomy, we hope to get a better grasp on what autonomy is. In particular, we want to know whether there are discernible and incompatible differences between conceptions of autonomy that relate to matters of endorsement, authorship, and desires. These are used interchangeably in the psychological literature, reflected by claims such as self-determined behaviours are those whose "motivation is authentic (literally, self-authored, or endorsed)" (Ryan & Deci, 2000b, p.69; Thomas et al., 2017, p.662). This suggests that both self-authorship and endorsement can be used interchangeably, even though these represent different theories in philosophical discourse (see Section 2.3.2; cf. Christman & Anderson, 2005; Kant, 1785; Raz, 1986). This may be the

case in certain lights, but without explicit consideration, this is quite an assumption to make. Elsewhere, autonomy is used to mean the same thing but defined as antonymous to control (Ryan & Deci, 2000b). Additionally, by investigating the different types of autonomy that are debated to this day, we may be able to shed some light on the plausibility and requisites for group level self-determined behaviour and collectively derived intrinsic motivation.

2.3.1. Psychology

The majority of academic research on the contextual factors that hinder or facilitate intrinsic motivation “has focused on the issue of autonomy versus control” (Ryan & Deci, 2000b, p.70). Autonomy is said to lead to a multitude of benefits, including greater perseverance in behaviour and greater levels of wellbeing (Pelletier et al., 1998), perhaps as a consequence of improved positive affect (Deci et al., 2000b).

Self-determined behaviours are authentically motivated and “literally, self-authored, or endorsed” (Ryan & Deci, 2000b, p.69). From this excerpt it is unclear what is meant exactly by self-authorship and endorsement, as these terms are not linked to any specific literature in the texts mentioned above. This text does not specify whether these terms can be interpreted with the same specificity as they are used in philosophical analyses (cf. Christman, 2003). This suggests that both endorsement and self-authorship conceptions of autonomy (see Sections 2.3.2.1. and 2.3.2.2., respectively), can be used interchangeably, and it is unclear if the intricacies and nuances between the schools of thought have been adequately considered. As such, here we explore these conceptions of autonomy in detail and explore to what extent these may indeed be used interchangeably or integrated, despite diverging philosophical discourse (cf. Frankfurt, 1971; Kant, 1785; Kant & Patton, 2005).

Autonomy is a central tenet in the Self-Determination Theory literature, and is an underlying concept in measurement tools such as the Motivation towards the Environment Scale (MTES; Pelletier, 1998). A number of academics have developed scales of autonomy to measure this construct empirically; the Index of Autonomous Function (IAF; Weinstein et al., 2012), the General Causality Orientation Scale (GCOS; Deci & Ryan, 1985) and the Basic Psychological Needs Scale (BPNS; Deci & Ryan, 2000; Gagné, 2003). In the following section, these will be examined in more detail to ascertain the theoretical constructs that underlie these empirical measures.

2.3.1.1. Index of Autonomous Functioning

The Index of Autonomous Functioning (Weinstein et al., 2012) explicates autonomy in terms of independence from external control. It operationalizes this in terms of three factors: (1) authorship / self-congruence, (2) interest-taking, (3) and susceptibility to control. In order to understand how these subscales are related and what they say about autonomy and motivation, we will investigate them below.

Autonomy is often presented as antonymous to external control — external contingencies and social pressures may dictate behaviour (e.g., Ryan & Deci, 2000a). Developed in collaboration with Richard Ryan, one of the authors of SDT, the IAF (Weinstein et al., 2012) builds on this dichotomization of autonomy support vs control. In the paper outlining the scale development of the index of autonomous functioning, however, the authors explicitly state that autonomy is not equivalent to independence, and further, that "individuals can be willingly or autonomously dependent, or sometimes forced or controlled to rely or depend on others" (Weinstein et al., 2012, p.397). According to the authors, they were the first to explicitly investigate the "central attributes or facets of the construct" (Weinstein et al., 2012, p.398). Furthermore, their work surmises that differences experienced in (dispositional) autonomy by individuals is a matter of degree rather than sort. The scale (five items in each subscale) was developed, tested and retested in seven studies (eight if counting Study 1a and 1b separately).

The first facet of autonomy that is described is that of self-congruence and authorship, which is developed from the work of Pfaender (1911), Ricoeur (1966) Sartre (1956) and Wild (1965). To be autonomous is to have a sense of authorship of one's actions, and fully standing behind these. Autonomous behaviours are to be experienced as authentic, and are based on the individual's "values, needs and interests" (Weinstein et al., 2012, p.398). This construct in particular is supported by a vast literature that links authorship to behavioural consistency.

Interest-taking refers to the "spontaneous tendency to openly reflect on inner and outer events" (Weinstein et al., 2012, p.398). This also is said to relate to introspection and evaluation, which is important for *self-governing*. This process involves a continuous learning about the self and reflective consideration. According to this, then, interest-taking is important to governance, requires reflection and being receptive to positive and threatening experiences.

Finally, Weinstein and colleagues (2012) consider the negatively scored concept of susceptibility to control, which is thus opposed to autonomy. Although being controlled is not necessarily

opposed to autonomy (by their own words in their introduction), being susceptible to it – supposedly unwillingly or unaware – is, or at least marks its absence. The absence of internal or external pressures is thus also important for someone to be autonomous. Counter to susceptibility to control are concepts like perception of personal choice and initiative taking. Self-imposed “have-to’s”, sensing pressure from others or oneself are classic indicators of a lack of autonomy (Weinstein et al., 2012, p.398). Although pressure from others, or perceiving a pressure due to do something for the instrumental benefits to be had by doing so are indeed generally considered to be indicators of those lacking autonomy, the experience of self-imposed “have-to’s” is not universally seen as indicating a lack of autonomy (cf. Kant, 1785, in Section 2.3.2).

2.3.1.2. General Causality Orientation Scale

Another scale that is used somewhat frequently in the literature, particularly related to self-determination literature, is the General Causality Orientation Scale (GCOS; Deci & Ryan, 1985). Research suggests there is a significant difference in how people interpret events and situations around them, leading to vastly different orientations of causality (i.e., autonomy). “Some people have a greater capacity to experience events as sources of information for initiating and regulating their own chosen behaviour, …[where others are] sensitive to or even search for extant controls in the environment” (Deci & Ryan, 1985, p.110). This suggests that not only can different people be more or less intrinsically motivated in different scenarios or under different circumstances, but different people also have a varying propensity to their own autonomous behaviour.

The scale is composed of 36 items in 12 vignettes, and measures three different modes of functioning: autonomy, control and impersonal. These subscales represent the different levels of the continuum of autonomous motivation from Figure 2-1, where impersonal refers to amotivation, control refers to extrinsic motivation, in particular external, introjected and identified regulation, and autonomy here stipulates integrated and intrinsic motivation (Deci & Ryan, 1985, p.131).

The autonomy orientation reflects an ability to perceive situations as involving choice, opportunities and a tendency toward an internal perceived locus of causality (e.g., Decharms & Carpenter, 1968). In this scale, each vignette features one item that pertains to autonomy. These items, roughly, represent: eliciting interest in others; investigation and seeking

understanding; relativizing self-esteem; supportiveness and openness; communicativeness; evaluativeness and reflectiveness; optimism and extraversion; inviting collaboration and participation; self-reflectiveness and critiquing the self rather than others; interest again; concern and caring; openness and challenges rather than problems.

The scale was developed from a pool of 96 items created by people familiar with *the theory*, that were instructed to include one autonomous, one controlled and one impersonal response to a number of vignette situations. The scale may be particularly useful in predicting dispositional reactions to a variety of broad situations and reflects how autonomously one orients themselves in and perceives situations, but does not seem to embody a thorough investigation of what precisely autonomy is as a theoretical construct.

2.3.1.3. Basic Psychological Needs Scales

At the core of self-determination theory are the three psychological human needs that must be met for an individual to thrive: competence, relatedness and autonomy. The Basic Psychological Needs Scale was developed by, among others, Deci and Ryan (2000a) to assess how competent, related and autonomous people feel, and has been developed in a general setting, at work, and regarding relationships. The workplace specific scale has been used most, particularly in organisational psychology, however, the general scale seems most relevant to the exploration of how the concept of autonomy is conceptualised and operationalised in this regard.

The 21-item scale features seven items per construct. Autonomy is measured with the following 7 items. The (r) next to three of the items indicates that the item should be reverse coded (i.e., negatively scored, as the item is designed to correlate negatively with the rest of the scale):

- I feel like I am free to decide for myself how to live my life
- I feel pressured in my life (r)
- I generally feel free to express my ideas and opinions
- In my daily life, I frequently have to do what I am told (r)
- People I interact with on a daily basis tend to take my feelings into consideration
- I feel like I can pretty much be myself in my daily situations
- There is not much opportunity for me to decide for myself how to do things in my daily life (r)

The scale seems to particularly measure authorship, being controlled, freedom of expression, consideration of others, and authenticity; not unlike the Index of Autonomous Functioning. Also,

similar to the Index of Autonomous Functioning is the fact that although the items roughly represent those of self-authorship (see Section 2.3.2.2., below), there is no explicit mention of it or related literature in the development of the scale. Finally, the scale also places an emphasis on how participants *feel*, rather than how free they *are*, which may make respondents more introspective.

2.3.1.4. Collective Autonomy

The conceptions and empirical measures of autonomy discussed so far have all been primarily (if not solely) regarding personal, individual autonomy. There is also a relatively young body of literature in the field of social psychology that investigates the plausibility, existence and relevance of collective autonomy. This research is similar to the research about the integration of humanistic and intergroup integration of norms proposed by Amiot and colleagues (e.g., 2017). Kachanoff (2017) introduces a type of autonomy that, rather than the individual, focuses on an individual's perception that their group experiences the freedom to express their group identity, culture and collective behaviour in the absence of control from other such groups (Kachanoff, 2017, p.4). This type of collective or cultural autonomy is particularly important in the harmonious coexistence, or rather flourishing of heterogeneous societies. If autonomy can be conceived of on a group level, it should not be so far-fetched that a member of this group may be influenced by the group and acting entirely autonomously and in line with the customs, values and beliefs of the group.

There are a number of scales in psychology that attempt to measure the construct of autonomy, with varying degrees of theoretical rigour. Autonomy is not always conceived of in the same way, and scales may measure autonomy as authorship and interest taking or measure autonomy by contrasting it to control and impersonal loci of causality. Particularly the IAF seems to have been constructed on the strongest theoretical foundation of autonomy, although here, too, the scale measures autonomy in reference to self-congruence and authorship as well as self-regulation and interest, without critically juxtaposing these as potentially conflicting conceptions of the construct being discussed. Philosophy has considered these types definitions of autonomy as well, but it is more common to favour a single conceptualisation rather than a combination of multiple conceptualisations when describing a single construct than in psychology.

2.3.2. Philosophy

Autonomy is often assumed for many philosophical investigations, but there is an ongoing debate as to what it means for an individual or behaviour to be autonomous (Christman & Anderson, 2005; H. G. Frankfurt, 1971). Rather than the psychological characteristics or circumstance of an individual, the majority of philosophical investigations of autonomy consider general and abstract principles (Arvanitis & Kalliris, 2017). Within philosophical endeavours, there are those that explore autonomy in the context of very real, practical and applied situations, such as in medical ethics (e.g., Blasimme & Vayena, 2016), and those whose treatment of autonomy remains a universal, theoretical and conceptual investigation (e.g., Christman & Anderson, 2005).

According to Buss & Westlund (2018), the minimal conditions for autonomy consist of "being the power behind whatever reasoning directly gives rise to one's behaviour". This simple definition does not, however, address some of the challenges to investigating autonomy more thoroughly. Hurka (1987), too, begins his exploration of autonomy stating that at least one understanding of being autonomous is "to direct oneself where different directions are possible" (p.361). Humboldt took this a step further and requires that autonomy involves the development of the self from one's innate nature – developed by one's culture – which is only possible under a variety of options and situations. Others, such as Tietjens-Meyers (in Christman & Anderson, 2005) contest that there is no single true self to be discovered, but rather that the self consists of five different but related components or dimensions: the self as unitary, social, relational, divided, and embodied. The key difference that is exposed in this debate is that of self-definition versus self-discovery (Christman & Anderson, 2005). Christman and Anderson (2005) begin their classification of autonomy with the dichotomization of moral autonomy versus personal autonomy. Moral autonomy, they posit, refers to the "capacity to subject oneself to (objective) moral principles" (p.2). Personal autonomy, to which moral autonomy is contrasted, in turn refers to all other conceptions that are not morally laden, thus an allegedly neutral trait.

The most significant branching of autonomy is that of moral autonomy (which we will cover in the next section on *endorsement or Self-Governance*) from personal autonomy (Christman, 2003). Personal autonomy is then further delineated into those that place the primary emphasis on desires (*hierarchy of desires* or *Volitional Resolve*), and those that focus on convictions instead. Those conceptions of personal autonomy that do not emphasize desires are what we

will further refer to as *self-authorship*. These are the basic categorizations of autonomy as these will be discussed for the remainder of the paper.

2.3.2.1. Endorsement

The most revered proponent of moral autonomy is Immanuel Kant (1724-1804), a German enlightenment era philosopher, who held autonomy at the heart of his moral philosophy, and considers “autonomy of the will as the supreme principle of morality” (Kant, 1785, p.440). According to this view, moral philosophy should characterize and explain the demands that morality makes on human psychology and forms of human social interaction.

Kant is famous for his categorical imperative, which implies that there are categorical (or universally applicable) rules to be followed to determine our behaviour. Rather than following externally imposed laws of authority, however, the laws we should abide by are those that come from within, as he considers freedom to consist of being bound by laws that are in some sense of one’s own making: “Act only according to that maxim by which you can at the same time will that it should become a universal law.” (Kant, 1785, p.432). Kant characterized the categorical imperative as an objective, rationally necessary and unconditional principle that we must always follow despite any natural desires or inclinations we may have to the contrary. This is to say that for an action to be considered autonomous, it should be in line with norms the agent recognizes as universally valid.

Importantly, this implies that our behaviour should not be influenced by our desires. Rather, we are only subject to moral requirements that we impose on ourselves through the operation of our own reason independently of our natural passions and inclinations. Reasons and motivation for behaviour should always stem from a place of rationality; anything that brings one to deviate from this is necessarily non-autonomous, and in this reading morally wrong. The reason for Kant’s exclusion of feelings, inclinations, and other particular aspects of our lives from the structure of autonomy is rooted in his metaphysical account of the human being, which radically separates the phenomenal human self from the noumenal human self. All empirical aspects of our selfhood—all aspects of our experience—are part of the phenomenal self, and subject to the deterministic laws of natural causality.

Although there is some good reason to believe that one’s personally held categorical values should determine whether an action is truly autonomous, others would question whether one is truly autonomous when one’s actions are predetermined by one’s values.

2.3.2.2. Authorship

Joseph Raz, a political and moral philosopher, has a rather different conception of what it means to act autonomously. Central to his idea of autonomy is the concept of self-authorship: that each individual should be able to determine how they live their life from the “many morally acceptable, though incompatible, forms of life be available to a person” (Raz, 1986, pp.155-175). Thus, the key here is that there is not simply one morally acceptable way to live an autonomous life, but rather, there exists a ‘moral pluralism’ (Christiano, 2004).

Raz believes that a further condition for autonomy is the development of inner capacities, including: “the cognitive capacity to process information, the emotional capacities to make sense of the worth of our moral options, physical capacities to realize our autonomous life plans, and finally the possession of character traits enabling the pursuit of an autonomous life” (Raz, 1986, pp.155-175). This is in line with Mill, who stipulated that an individual’s impulses and desires must be their own, and that these should be shaped or developed by their culture.

A key component that distinguishes Raz’s conception of autonomy from that of most rational moral philosophers is that the role of social context and relations is explicitly referred to. In fact, one’s individuality is expressed through social practices, and in one’s engaging in “socially formed relations and pursuits” (Raz, 1986, pp.155-175). Additionally, people should be able to belong to different and distinct social groups and this should influence who they are and how they live their own autonomous life. It is important to one’s overall living an autonomous life that people are able to pursue relations and to grow from the resulting insights gained and personal developments made. An individual may at first have a particular goal pursuit in life, but over the course of settling into oneself, come to revise their life ideally lived, and adjust their behaviour and pursuits accordingly.

For the sake of envisioning autonomy comprehensively, the concept of self-authorship will be dealt with explicitly as Personal Self-Authorship and Social Self-Authorship. There is no clear defined line that separates the influences of one’s personal individual context and one’s social context, given that, barring extreme situations, individuals live, become and exist in a, and generally multiple, social sphere(s). For the purposes of exploring the role that social relations and identifications may have on the conception of autonomy, the distinction between personal and Social Self-Authorship will be made explicit, and the two concepts will be explored separately in Section 2.5.2.

2.3.2.3. Hierarchy of Desires

On the other side of the spectrum of philosophical autonomy discourse from Kant, are views held by Humean philosophers who firmly believe that to be autonomous is to act in accordance with one's most fundamental passions and desires (H. G. Frankfurt, 1971). Rather than a matter of rationality, one is only autonomous when our behaviour stems from a place of volitions. What this implies is that, as humans, we have desires and to ignore these would be counter to autonomy.

Furthermore, we have these desires on different levels: first-level desires are preferences held over different actions, whereas second-order desires are evaluative and consider preferences held over different first-order desires. As such, the objects of first order desires are what the agent wants, whereas the object of second order desires are what the agent wants to want (Frankfurt, 1971). 'Besides wanting and choosing and being moved to do this or that, men may also want to have (or not to have) certain desires and motives' (1971, p.7, emphasis in original). Importantly, persons (as opposed to wantons who only form first-order desires) are those who can form second order desires over their first order desires, in effect choosing whether their first order desires are effective (leading to action) or frustrated (in conflict). A second-order volition pertains to the desire that the agent wants to be effective. According to Frankfurt, the agent's second-order volitions constitute his freedom of the will. They are what make him autonomous.

But why stop at the second-order level? In principle, an agent can have a third-order desire. For example, a first order desire that someone may have is to smoke - the action itself may be desired. However, there could be a second order desire to be healthy and not smoke. This would then constrain the first order desire. However, if there is a third order desire over and above the second order desire to not be too much of a health nut. Michael Bratman has proposed a solution to this problem. He does this with an account of intentions and self-governing policies, which supersede simple values, and claim that there is a practical limit or control over the argument of infinite higher order desires (Bratman, 1992).

The key takeaway from this conception of autonomy, then, is that it requires that our will direct us, and that behaviour stems from deliberate choice (Christman & Christman, 2019). In order for our will to be as we want it to be, the desires that inform our motivated behaviour should themselves be deliberately desired – these are the desires that we want to motivate us (H. G. Frankfurt, 1971; Loughrey, 1998). Reflection, judgment evaluation and deliberation are crucial

parts of an autonomy that could very easily be misconstrued as consisting of nothing more than desires. Desires that, upon reflection, we do not want, should be frustrated, and not lead to the behaviour that the initial desire pertains to.

2.4. Integrating Autonomy

Autonomy, as it is conceptualised and categorised above, in moral autonomy, self-authorship and Volitional Resolve are three competing, different and somewhat disjointed prescriptions of how people should act, or what should act as the precursors to autonomous behaviour. There are certain ways that these three understandings of autonomy overlap, apparent by their aims to explain what behaviour should be, and how the *good* of autonomy should inform this, but there are also serious conflicts that arise between these conceptions. One by one, the different combinations will be compared and contrasted to one another, exploring how Self-Governance and Self-Authorship, Self-Governance and Volitional Resolve, and Self-Authorship and Volitional Resolve relate.

2.4.1. Self-Governance and Self-Authorship

In order to compare and contrast Self-Governance and self-authorship, there are a number of core concepts that should be treated in isolation, including rationality, morality, universality, rigidity and the interplay between hedonism and eudemonism.

Rationality plays a central role in both Self-Governance and self-authorship. The difference, however, lies in how strict this concept of rationality is treated in each. For Self-Governance, rationality is the epicentre; the most fundamental origin of autonomous behaviour. Rationality is what informs our sense of morality, duty, right, wrong, and as such, that which informs how we should behave in each situation. Self-authorship, on the other hand, also sees autonomous behaviour as entailing rational thought, but rather than rationality informing the right and wrong that exist in the abstract or generalisable sense, rationality is the process by which different acceptable but incompatible courses of action are to be juxtaposed and decided between. Crucially, for self-authorship, the criteria used to choose what to do is personally dependent and different for everyone. What is important here is what someone wants to do, what they aspire to and what kind of life they want to achieve. In order to get to where they want to go, different

paths must be chosen that lead there. Although proponents might also say that Self-Governance stipulates that the criteria based on which decisions are made are individual, this is only insofar as different autonomous people would impose slightly different moral laws unto themselves. This brings us to our next point: morality.

Morality is a core feature of Self-Governance, given that this is how we conceptualise moral autonomy in our analysis. All behaviour, or all autonomous behaviour, should come from a place of moral consideration. Any behaviour that is not morally justifiable is, in the eyes of someone who subscribes to the view of Self-Governance, not autonomous. This seems like a very stringent limitation of the conception. For self-authorship, however, moral pluralism is a defining feature and implies that there is no single correct, or morally justified way to behave in any given circumstance, but often a number of justifiable courses of action (Raz, 1986, p.133). Additionally, there is no single ideal, moral good life to aspire to, but everyone may lead a vastly different but equally morally justified life if they so choose. In this way, the Razian approach to autonomy, which we also refer to as self-authorship, does not make as strict claims about morality as Kantian Self-Governance, despite being borne out of a book titled *The Morality of Freedom (1986)*.

In a similar vein, what goes hand in hand with this idea of the intertwined nature of morality and autonomy is the universality of autonomy. Kantian ethics, based on the categorical imperative would say that the laws one prescribes to themselves and accordingly freely ascribes to are universal. These are laws that apply and one freely but determinately binds themselves to in every instance that they apply. In this way, there is little room for growth, development and changing of these laws once they have been established. Of course, no one would expect an infant to have a fully formed moral compass and self-governing laws worked out, but for this same reason, the infant is not considered autonomous. Once a person is developed and rationally capable, they may start to form these laws and consequently may become an autonomous person. Furthermore, these laws should apply to everybody, and are thus universal both temporally and interpersonally. Self-authorship is, again, far more relaxed when it comes to universality. First of all, as the main thesis of the theory is that people should be free to choose and to direct themselves, this does not need to be identical for each individual—on the contrary. Furthermore, given that this same sense of self-direction is subject to development, or change, an individual may find that over the course of their life certain events may cause a shift in who they believe they should be and how they wish to live. This allows for an entirely different set of behaviours to be autonomous at different times. As such, there is an implicit non-universality

built into the conception of self-authorship which places it in direct opposition to Self-Governance.

Finally, the last concept that will be used to contrast Self-Governance and self-authorship is that of hedonism, or the seeking of gratification or pleasure and the avoidance of discomfort and pain. Kant explicitly stated that hedonism in the sense of promoting one's happiness does not automatically preclude the behaviour from being autonomous. However, it is crucial that "he should promote his happiness not from inclination [wanting or liking] but from duty" (Kant, 1785, p.399). Thus, the moral nature of Kantian ethics and the importance of duty mean that hedonism in and of itself can never be an autonomous motivation of behaviour. The happiness that is promoted by the autonomous actor is closer to that of eudaimonia, of gratification from the pursuit of purpose and duty. For self-authorship, on the other hand, it is conceivable that one's primary purpose in life is to live their happiest and most gratified life possible. Following this line of reasoning, it may be perfectly autonomous for someone to engage in an activity if they know that this will bring them joy and will not impair their happiness at a later stage. In this sense, there are different implications for what would qualify as intrinsic motivation as long as intrinsic motivation requires autonomy.

2.4.2. Self-Governance and Volitional Resolve

At first glance, Self-Governance and Volitional Resolve seem to be almost opposite conceptions of autonomy, and seem to contradict in most ways. For the comparison of Self-Governance and Volitional Resolve, different concepts will be investigated. These include rationality, evaluation and reflection; reason versus desires; happiness and satisfaction; and frustration of alternatives.

An important place to start this analysis is with rationality. Self-Governance, as we have seen, makes some very strong assumptions about rationality. Volitional Resolve, which is a far more personal and individual account of autonomy makes equally strict, and opposing, claims about rationality. Kantians would say that rationality is precisely that which allows for people to make decisions based on duty, morality, right and wrong, and in that way, what they so autonomously choose to do. Frankfurt, counters that "[t]he judgments a person makes concerning rationality are manifestly no less dependent than are any other occurrences in his life upon contingent features of his nature and of his circumstances" (1982, p.267). What this implies is that if we are

to rely on rationality, this precludes our individuality from influencing what we do, and in that way, we can never be autonomous, because the behaviours are never truly our own.

Perhaps the more striking comparison between these two forms of autonomy is the role that reason and desire play in each. Kant's moral and rational Self-Governance proposes that reason is the basis upon which all autonomous behaviour is most fundamentally based. Our autonomous conviction and the laws we willingly impose on ourselves are direct descendants from the reasoning that allows this. Desires, however, can get in the way of this process of reasoning leading to the formation and subsequent following of our rational duties. Humans have a limited capacity for moral strength. As such, the study of virtue and virtue ethics must account for how to overcome one's inclinations and keep these in check (Kleingeld, 2017). On the other hand, for Frankfurt, reason is precisely what desires are to Kant, and vice versa. Our desires are what make us human, what let us act in personal, individual ways, or in other words, autonomously. If we were to follow nothing but our reasoning, this would make us little more than robots. Crucially, however, acting on any and all desires would not automatically make someone autonomous, but to ignore them entirely seems preposterous.

Where Kant and Frankfurt might find some common ground, then, is in the importance of judgment, evaluation and reflection. To Kant, these are all processes of rationality, of reason, of the minimal thinking required for a person to conceive of what constitutes their duty, and what would be morally required of them in each situation. Frankfurt would agree that deliberation, judgment, reflection and evaluation are paramount, only in a different way. For Frankfurt, to be autonomous is to listen to all of one's desires, and to only act on those that correspond to a higher order desire. For the autonomous person does not only care "about following the particular course of action which he is constrained to follow. He also cares about caring about it" (1982, p.265). Bigelow and colleagues clearly illustrate this interplay between desires and morality. "Sometimes it is a desire they think they should not have. Sometimes it is one they think they morally should not have, but they want to have it anyway. Sometimes they do not mind feeling the desire, but they do not want it to be their strongest desire – they do not want it to be causally operative" (Bigelow, Dodds & Pargetter, 1990, pp. 39–49.) The former quotation from Frankfurt is an example of the coming together of a first order and second order desire. The latter excerpt from Bigelow is a case of temptation, where the first order volitions one perceives are not in line with one's second order desires and acting on this desire would be non-autonomous. Desires are the root of autonomous behaviour, but only if there is no frustration at a higher level.

2.4.3. Self-Authorship and Volitional Resolve

Finally, the last comparison that can be made between the types of autonomy that we have identified is between morally pluralistic and rational self-authorship and the desire-based conception of Volitional Resolve. Crucial elements to unpack in this relation is the difference between desires and rationality, as well as the role that time plays.

We have identified from the previous two subsections that there is no direct conflict between these two conceptions with respect to morality. Where self-authorship is morally pluralistic, Volitional Resolve is free from morality. “Even when volitional necessity arises in connection with actions which are required or forbidden by duty, it does not derive from the person's moral convictions as such but from the way in which he cares about certain things” (Frankfurt, 1982, p.268). Autonomous behaviour may coincide with moral behaviour, but only when the individual truly cares about what the act represents, rather than because some external moral sense of duty demands it. Similarly, self-authorship is morally pluralistic in that a vast array of options are morally permissible, exactly because as long as they are in line with the aspirations and directions of an individual’s life, and they happen to be morally just, they are autonomous.

Where the two conceptions seem to diverge, however, is in the root of the thoughts behind the behaviour. Here, we maintain that self-authorship is based on rationality, whereas Volitional Resolve precludes rationality as this is external to the self. Where these may find some resolution, however, is that the rationality in self-authorship does not refer to precisely the same reading of rationality as in Volitional Resolve (or Self-Governance, for that matter). Rather, the rationality required in self-authorship is merely a structured judging of the various forks in one’s life path that one must consider, in order to *rationally* determine which of the paths are autonomous because they lead to the life they choose to live. As such, this may be more of a semantic issue than an inherent one

Another point that at first seems like an irreconcilable difference between the two, is in terms of the temporal frame of evaluation. Self-authorship is concerned with the authoring of one’s life, the aspirations of an individual, many of which are not unlikely at a life-time level. Volitional Resolve, on the other hand, comes across as more of a here-and-now type of autonomy. Although this may be true in how the situations are described and the examples are presented, this is in part because they line up more closely with the terminology used to describe and define the concepts in the first place. It is perfectly conceivable that autonomous behaviour with

respect to self-authorship pertains to a goal or way of life that can be realised in the exact moment that the choice is made. Similarly, a second order desire may, to the recovering drug addict, or the vegan be a life-long second order desire, with endless first order desires that try to cause frustration and prevent them from living autonomously. Although this is conceivable, it does not detract from the fact that it is more realistic within Volitional Resolve that an individual change their mind and their second-order desires more frequently than within self-authorship, where, in general, only major life events tend to lead to an entirely different collection of life goals and aspirations (Raz, 1986).

2.5. Autonomy and Intrinsic motivation

In order to make any kind of judgment as to what to believe about autonomy and how to use any of these insights, it is particularly useful to consider what each of these conceptions of autonomy actually imply for intrinsic motivation as a whole, individually. Of course, the assumptions of autonomy are different in each case, and if there is any intent to implement these understandings of autonomy, we should also consider, in isolation, what this would mean for the reigning theory of intrinsic motivation as it stands.

2.5.1. Self-Governance

If this form of autonomy would be used in the SDT literature, this would have some significant consequences for the theory. Whereas in the dominant SDT literature, personal autonomy is central to and the main driver of intrinsic motivation, a conception of Self-Governance, or moral autonomy, would change this view significantly.

In the Self-determination literature, hedonism is central to truly intrinsic motivation, as marked by definitions such as “tendency to engage in an activity for the sole pleasure and satisfaction derived from its practice” (Pelletier et al., 1998, p.441). Taking a Kantian approach to autonomy, this conception of intrinsic motivation is at odds with the claim that autonomy is required for intrinsic motivation. “And, in fact, we find that the more a cultivated reason devotes itself to the aim of enjoying life and happiness, the further does man get away from true contentment” (Kant, 1785, p.395).

Not only would this kind of autonomy fundamentally change what qualifies as autonomous, and, as such, what could be considered intrinsic motivation, it also implies a change in the ordering of the different motivational types along the spectrum (see Figure 2-1). Rather than hedonism and pleasure, the highest level of motivation, and, supposedly the most *desirable*, sustainable self-determined and *good* type of motivation would be closer to what is now conceived of as integrated motivation.

Perhaps this is actually a matter of values, which is how personal moral norms are often conceived in the psychological literature. What is now considered intrinsic motivation would arguably only be considered autonomous to individuals with particularly strong hedonic values, as deriving pleasure and satisfaction from behaviours need not be in line with what someone considers to be willed as a universal law. However, this may still be in conflict with the straying from true contentment of the individual that aims to enjoy life and pursues happiness, as the earlier quotation suggested.

The current operationalisation of intrinsic motivation would likely be regarded as lower than integrated, and perhaps even lower than identified and introjected motivation. A more in-depth analysis of this would require a more directed investigation of Self-Governance and how it relates to the levels of SDT.

2.5.2. Self-Authorship

Crucially, self-authorship would also do a lot to affect how intrinsic motivation is conceived of in contemporary literature. Whereas the current literature focuses on individual personal autonomy, and often attributes intrinsic motivation to pleasure or satisfaction, self-authorship relates far more to autonomous life-goal pursuits than to instant gratification. It is this value pluralism that sets Raz's self-authorship apart from self-determination theory, as it allows for someone to author their own life by being committed to values such as friendship, sports, or philosophy. In this way, autonomy and thereby intrinsic motivation becomes topic neutral. More importantly, self-authorship allows for a significant role to be played by other people, groups and even the society an individual belongs to.

This inherent social dimension of self-authorship is perhaps the most radically different aspect that any of these forms of autonomy has to offer to the theory of SDT. This implies that rather

than being limited to an external or introjected locus of causality, another person or an individual's group could offer an influence that can be identified, internalised and even fully integrated for the individual. Thus, the concept of self-authorship may simply be less stringent with respect to where an initial influence is allowed to come from to be intrinsically motivating. Of course, it is paramount for this conception of intrinsic motivation that the individual does actually internalise the opinions or influenced of others – if an individual acts based on the influence of another that they do not assimilate to, this would still be regarded as extrinsically motivated.

Regarding what is currently defined as intrinsic motivation, this hedonic ideal need not be non-autonomous, as a Kantian approach would suggest. It is perfectly plausible that the goals and aspirations that one holds most dear is to enjoy life to the fullest. Although this may not be the most specific goal –and thus the matter of moral pluralism may be particularly relevant– this does mean that it may *also* be autonomous and even intrinsically motivated to pursue happiness, gratification and pleasure.

2.5.3. Volitional Resolve

Volitional Resolve presumes that autonomous behaviour requires having reflected upon the desires that move an individual. Even though this form of autonomy may not seem particularly disparate from the autonomy features in the self-determination theory literature, there are still significant implications for the theory if it were to be adapted for Volitional Resolve.

Importantly, as with the other types of autonomy discussed, the fact that someone is the principal actor and decision maker with regard to their behaviour is assumed. However, for Volitional Resolve, it is also important that motivation starts from one's desires, and behaviour is subsequently selected in line with the reflection upon the individual's desires to act in the way that is in line with their highest order desires. Regarding the autonomy featured in self-determination theory, this need not pose an insurmountable problem, but rather requires some specification.

As SDT stands, it would seem entirely plausible that a recovering drug addict would be autonomous when they relapse, even if upon reflection this is not what they most desired. At the time, doing drugs may have brought them pleasure, happiness and gratification, as is often the case with drugs. However, this may not have been in line with their higher order desire to stay

sober, clean and in recovery. Thus, for SDT to consider behaviour like this as intrinsically motivated seems preposterous in light of Volitional Resolve. Given that Volitional Resolve requires that autonomous behaviour is in line with a higher order desire, or at the very least does not frustrate a higher order desire implies that the drug user in the example is not behaving autonomously. As Intrinsic motivation requires autonomy, SDT should then agree that this does not qualify as intrinsically motivated behaviour. We believe that any theory that would consider the recovering drug addict's relapse as autonomous or intrinsically motivated requires reconsideration.

This concern would be resolved if the theory of intrinsic motivation would be adjusted to require gratification or satisfaction with behaviour following reflection on an individual's (higher order) desires. We believe that this addition to the theory, without being too invasive or narrow would make the resulting framework a lot stronger and more plausible.

2.6. Discussion

In this chapter we set out to revise our understanding of autonomous motivation, starting by revisiting the definition and conceptualisation of autonomy, taking self-determination theory as a starting point. To do this, we have explored in some detail what intrinsic motivation is, why intrinsic motivation is purported to be important in contemporary literature and where it comes from. In particular, we focused on the requisite proposed by the self-determination theory as particularly crucial for intrinsic motivation: autonomy. Given the vast amount of research already conducted by philosophers over the last millennia, we contrasted the insights from three different schools of thought to each other and the psychological conception of autonomy. The resulting conceptions of autonomy, Self-Governance, self-authorship and Volitional Resolve had led us to a number of insights that may be fed back into the psychological narrative of intrinsically motivated behaviour.

From investigating Self-Governance, we believe that self-determination literature as well as other motivational theories may profit from reconsidering the role that self-imposed legislation plays in behaviour. Morality is studied at length in psychology, but is rarely combined explicitly with intrinsic motivation, likely because of the seeming opposing nature of doing what is *right* and doing what is *fun*. Revisiting this relation, especially from a starting point of Kantian ethics

may expose that there is more of an overlap between Aristotelean eudemonic well-being and morality than generally posited in the literature.

Next, there is a tendency to regard autonomous as an individual trait, experienced by an individual to make an individual choice in isolation, free from social influence. Self-authorship explicitly considers the social context in which an individual exists, and rather than dismissing or removing this context, it realises that in reality, virtually all choices are made in a social context, directly or indirectly. It is impossible to expect individuals to be unaffected by others, and thus, autonomy should also be more open to the influences that a person, group or society has on an individual. As long as an individual internalises this influence, the resulting behaviour may be intrinsically rather than extrinsically motivated, as SDT would suggest. Investigating the boundary conditions and limits of social influence in intrinsically motivated behaviour may validate some of the novel propositions of a group level intrinsic motivation as suggested by, for example, Amiot and colleagues (2017).

Finally, the conception of Volitional Resolve does not place as stringent constraints on autonomy so as to require morality or even full rationality. However, Volitional Resolve does require deliberation, evaluation and reflection. Rather than simply behaving haphazardly, this form of autonomy requires that behaviour is not just based on desires (as seems to be the case in the current theories), but also requires that some (explicit) comparison of wants to desires takes place (i.e., an evaluative judgment) for a behaviour to be autonomous, and consequently, autonomously motivated.

Even without empirical testing, these are already valuable conclusions as they stand, as this may open the doors to a more inclusive study of autonomy (both regarding multiple forms of autonomy and also a form of autonomy that allows for social influence). Furthermore, these conceptions may all be conceptually and theoretically possible, but in order to see what this means for intrinsic motivation in practice, it is important to test these conceptions empirically. The next step is to operationalize these and to see if people actually perceive behaviour that is in line with these conceptions is truly autonomous and whether such behaviour intrinsically motivates them (e.g., exhibited in absence of external consequences, and more sustained). If this is the case, this may significantly impact the study of intrinsic motivation within psychology.

By investigating the empirical significance of these conceptions, we may also be able to shed light on these different philosophical contributions and to inform the philosophical debate more

directly. Although some philosophers may be perfectly content with the parallel argumentation of orthogonal ideas of autonomy, there is general consensus that there can only be one truth; one real definition of autonomy. By investigating autonomy empirically, especially when conceptualised and operationalised from the philosophical literature, these insights may shed light on autonomy and how it manifests in the real world.

By contributing to a clearer picture of what defines autonomy and intrinsic motivation, research may become more focussed and policy aiming to promote certain behaviour, for example cooperative, sustainable or healthy behaviour, may consider designing policy in line with these insights.

3. Scale Development of PhICAM

Abstract

People are more likely to act pro-environmentally when they are intrinsically motivated to do so. For motivation to be intrinsic implies that the motivation comes from within. We present the view that autonomy, rather than enjoyment, is the defining element of such motivation. We also posit that because autonomy can come from the individual or from a group (i.e., when seen as part of the self), this allows for a broader understanding of autonomous motivation: people do things because it is an authentic and considered choice of their own personal or group identity, free from internal compulsion or external manipulation.

Based on philosophical theories, we propose that autonomy, and the resulting autonomous motivation, can be understood in different ways. These theories underpin the four subscales of our novel psychological scale: Self-Governance, personal and Social Self-Authorship, and Volitional Resolve. First, behaviour is autonomous when an individual believes it is universally justified (Self-Governance). Second, an individual behaves in a way that is appropriate for who they want to be or become, subject to their personal and social identity (personal and Social Self-Authorship). Third, people genuinely want to do what they do in light of their desires and the values they subscribe to (Volitional Resolve).

We develop and test the reliability and validity of the Philosophically Informed Conceptualisation of Autonomous Motivation (PhICAM) scale, based on these (four) types of autonomy to explain motivation. In three online survey studies (n=172, n=245 & n=222) we determine whether it is possible to empirically distinguish between the different types of autonomous motivation based on the respective understandings of autonomy. We further investigate how the scale correlates to other relevant constructs, and to what extent each type of autonomous motivation predicts easier and more difficult pro-environmental behaviour.

3.1. Introduction

Climate change presents a complex and multifaceted challenge on a global scale, caused in part by human behaviour and therefore demanding a sustained shift in behaviour to mitigate further catastrophe (IPCC, 2022). Many pro-environmental behaviours are typically not experienced as in line with an individual's self-interest as they often do not lead to short term extrinsic or instrumental rewards. For example, buying sustainably sourced products tends to be more expensive, and recycling waste can be a tedious and time-consuming activity without any direct benefits to the individual (Kurz et al., 2015; Lavelle et al., 2015). It is for this reason that intrinsic motivation is often an important source of pro-environmental behaviour.

For motivation to be intrinsic requires that it comes from within, and is not a product of compulsion or external pressures. Intrinsically motivated behaviour is generally sustained over longer periods of time without the need for enforcement, surveillance or incentives, because the behaviours are engaged in for their own right, rather than for the consequences associated to them (Milovanovic, 2021; Ryan & Deci, 2000b) and are associated with improved well-being outcomes (Pelletier et al., 1998). It is therefore of great value to understand what it means for behaviour to be intrinsically motivated, and how intrinsically motivated behaviour may be fostered in general, and in the environmental domain in particular. This is the central aim of this paper, where we develop and test the validity and reliability of a novel psychological scale of Philosophically Informed Conceptualisation of Autonomous Motivation.

Intrinsic motivation is generally understood as wanting to engage in a particular behaviour for the sake of the behaviour itself rather than because of the consequences of the behaviour for the individual. Self-determination theory sometimes conceptualises intrinsic motivation as doing something for the pleasure or enjoyment derived from engaging in the behaviour itself, or behaviours that lead to hedonic gratification (Deci & Ryan, 1985; Pelletier et al., 1998; Ryan & Deci, 2000b). Building upon this idea, the self-determination theory (Deci & Ryan, 1985) states that for an individual to be able to be intrinsically motivated, the three basic human needs – competence, relatedness and autonomy – must be satisfied to a minimal degree. Competence refers to having some basic level of mastery over the behaviour; relatedness implies a sense of connectedness to others; and autonomy is understood as behaving free from external influence or control (Deci & Ryan, 2000b). We believe that autonomy is the most important facet and indeed should be the focus of the understanding of such motivation. Given these two concerns

with the self-determination theory literature, and that intrinsic motivation has become somewhat synonymous with the Self-Determination understanding, we choose to focus on a concept that we will call autonomous motivation. This gives us the opportunity to define a concept and process that allows for social influence to be internalised and explores different approaches to autonomy as described below.

While self-determination theory (SDT) contributes a strong empirical foundation to the intrinsic motivation literature, the theory also makes some assumptions that constrain the conceptualisation of the construct to quite a narrow understanding of intrinsic motivation. There are two predominant concerns we have with SDT, namely the emphasis on deriving enjoyment or pleasure from engaging in intrinsically motivated behaviour, and that intrinsic motivation is conceived as something inherently individualistic.

We believe that considering only behaviours from which an individual derives pleasure is too narrow, especially in the environmental domain (Steg et al., 2016). For many kinds of behaviour, including sustainable behaviour, hedonic enjoyment is often not a realistic standard for intrinsic motivation as it seems unlikely that someone would derive any direct pleasure or enjoyment from recycling waste or purchasing more expensive organic products. Rather, we prefer the view that as long as the behaviour is engaged in for autonomous reasons, there may be internal rewards of pleasure or purpose (Zeiske, 2021).

Additionally, the theory focuses on motivation that is free from influence, and generally takes a rather individualistic approach to motivation, not including group processes or social identities. This is to say that motivation arising from social influence is necessarily a less autonomous locus of causality, and therefore not intrinsic. This is also apparent from how intrinsic motivation is typically operationalised (see the operationalisation of intrinsic motivation in Pelletier et al., 1998). We argue, in line with the social identity approach in general, and the self- categorization theory in particular (Turner, 1991), that social influence can reflect an internal process, as group members trust the information shared within the group as their own (Spears, 2021). Nonetheless, many people engage in these kinds of behaviours, without being forced, coerced or manipulated into doing so, and are presumably not gaining any rewards from doing so. If this behaviour is motivated intrinsically but not through a hedonic pathway, there must be alternative avenues to intrinsic motivation that are currently not fully captured.

The second issue that we feel must be addressed when revisiting the current understanding of intrinsic motivation is that of individuality. Although a critical element of intrinsic motivation is of course that behaviour should be freely chosen and exercised, and that the individual should be free from coercion (Deci, 1975), the understanding seems to be taken to an extreme. There is such an emphasis on the *self* within self-determination, that sees the individual as an autonomous island, that it seems to preclude social influence (Pelletier et al., 1998; Weinstein et al., 2012). It seems to be generally assumed that only the motivation that is experienced as arising in the absence of any other people or other types of social influence can be considered intrinsic.

There is a small and relatively recent body of literature that covers the understandings of a collective or group-level self-determination. The conceptualisation of collective autonomy has a focus on groups as the level of analysis, rather than individuals experiencing social influence (Kachanoff, 2017). Alternatively, the model of internalisation of normative social harm-doing (MINSOH) outlines the factors that encourage and inhibit the internalisation of harmful group norms, by integrating social identities and self-determination theory (Amiot et al., 2017). These narratives make a considerable contribution to understanding how social influence can be intrinsically motivating, but for our synthesis, we choose to focus on a single underlying shared concept that allows for motivation to be experienced as authentic and their own, or rather: autonomous.

Rather than intrinsic motivation leading to some form of individualistic hedonic gratification, we believe that it is more relevant for intrinsically motivated behaviour that the motivation emanates from the self and is genuinely endorsed. For the behaviour to come from the self implies that the reason for doing something has been internalised – the reason has been made their own, and become something integral to the core beliefs of the individual rather than the extrinsic consequences associated with the behaviour (Frey, 1997). This is largely in line with the autonomy argument made in the self-determination theory, emphasising the importance of being autonomous when deciding to engage in a behaviour. We argue that behaviours experienced as emanating from the self or from internalised convictions is essentially what it means for the behaviour to be autonomously motivated.

Accordingly, we posit that the most important element or mechanism required for a behaviour to be intrinsically motivated, is that the decision to engage in the behaviour was made autonomously, and that the operationalisation of this construct should thus be phrased

accordingly. Autonomy obviously features within the self-determination theory, but only as a core background concept, not as a concept that is critical in the operationalisation of the measures that are meant to capture the meaning of intrinsic motivation—or at least, only insofar as making sure the motivation is not a result of external pressure from others (see e.g., Deci & Ryan, 2000a; Pelletier et al., 1998; Weinstein et al., 2012).

The Index of Autonomous Functioning, developed by Weinstein and colleagues (2012) offers insights into how autonomy can be understood in the realm of Self-Determination Theory. The scale distinguishes between self-congruence, interest-taking and susceptibility to control. Although the subscale of self-congruence is an interesting take on autonomy, interest-taking and susceptibility to control in particular suffer from a very narrow approach to autonomy. While being agentic and free from control is crucial, the way this construct is framed leaves very little room for social identities to influence an individual and allow an individual to grow as a person through social pursuits. Such a scale offers valuable insights into how an individual believes they are free to behave, but does not quite capture the essence of motivation stemming from what one autonomously chooses to do.

In order to understand the basic premise of this type of motivation based on autonomy first and foremost, and in order to distinguish this from the current intrinsic motivation literature, we offer a reconceptualization of the construct of intrinsic motivation as autonomous motivation, and develop a novel scale to measure autonomous motivation. We propose that autonomous motivation is a broader and more useful conceptualisation of the ideas that intrinsic motivation was originally based on, which allows for an understanding of motivation for a wider range of behaviours, in particular those not typically associated with individualistic hedonic gratification (e.g., there is very little pleasure to be derived from switching off the lights when leaving a room). Our novel contribution to understanding autonomy is integrating the insights from different competing philosophical understandings of autonomy as distinct subscales to form the Philosophical Conceptualisation of Autonomous Motivation (PhICAM) scale.

3.1.1. Philosophical Conceptions of Autonomy

We distinguish four types of autonomous motivation that feature prominently in the philosophical literature of autonomy—Self-Governance, Volitional Resolve, Personal Self-Authorship and Social Self-Authorship.

3.1.1.1. Self-Governance

Kant (1785) proposed that autonomous people govern their behaviour by subjecting themselves to self-imposed laws that dictate how all people should behave. This is what is more commonly known as the categorical imperative. His theory states that to be driven by hedonic considerations—seeking pleasure and avoiding pain—is decidedly not autonomous (Kant, 1785, p.398). Rather, behaviours should be engaged in because they are considered to be the morally justified thing to do.

To return to the domain of sustainable behaviours, we can think of autonomous motivation from the perspective of Self-Governance in terms of water conservation efforts. Taking a shorter shower, for example, should not be motivated because of the warm and fuzzy feeling it elicits, but rather because they believe this to be the way that each individual should behave in that particular circumstance. Although it seems unlikely that all (or even many) people operate entirely according to Kantian principles, this understanding of autonomous motivation proposes that if people are motivated by convictions of right and wrong this should be considered to be more (rather than less) internal or intrinsic than hedonic considerations. In other words, according to Kant at least, morality should not be distinguished from intrinsic motivation, but is inherent to it.

3.1.1.2. Volitional Resolve

We draw on the notion of second-order volitions, or hierarchy of desires (Frankfurt, 1971), to develop our concept of Volitional Resolve. Frankfurt argues that all animals have wants, or basic (first-order) notions of what we want or crave to do. What sets humans apart is that we have the capacity for evaluative desires: complex higher-order volitions of what we genuinely *want* to do and whether we want to act on (or frustrate) our first-order cravings. Humans are unique in their ability to behave autonomously as they may choose to act in line with their higher-order volitions, even if it means frustrating their first order volition.

To illustrate this, we can put this kind of autonomous motivation in the perspective of sustainable behaviours. We can imagine an individual arriving home after cycling home through the wind and the rain. It would be understandable of them to want to take a long shower to warm up and relax. However, the cyclist may have a higher-order desire to behave sustainably, which is at odds with taking a long warm shower. In this example, behaving autonomously requires taking a

short shower; in favour of the higher-order volition of sustainability over the lower-order want of comfort and relaxation.

3.1.1.3. Self-Authorship

Self-authorship is borne out of the idea that people's behaviour should be in line with their comprehensive (i.e., overarching; Steg, 2016) goals in life (Raz, 1986). The choices and decisions someone makes, especially the important ones, are made in a particular context that in turn determines which subsequent paths are available. The opportunities and decisions that are available to someone are a result of a combination of the previous choices that were made and the physical and social environment in which they were made. For a person to act autonomously is to act in line with what they find important, and which behaviours may lead them to being the person they aspire to be.

As people are inherently social, Raz suggests that one's social surroundings play an important role in self-authorship. Although Raz does not make a strict distinction between the personal and social dimensions of self-authorship as two separate forms of autonomy, we believe there is value in investigating whether it is possible to empirically distinguish this social dimension from the personal dimension regarding what motivates behaviour. In our conceptualisation, Personal Self-Authorship pertains to engaging in a behaviour because this is of significant personal importance to the individual, and represents a goal that they have developed individually or perceive as developed by themselves free from social influence. Social Self-Authorship, on the other hand, refers more explicitly to how the goals that are shared within an individual's social spheres may be internalised to a point of integrating it as their own, and wholeheartedly believing that this is how they autonomously choose to behave.

This understanding of Social Self-Authorship, in particular, is in line with self-categorisation theory which posits that one's social identities are constitutive of one's own identity, and should thus be considered no less internal or authentic of the self than elements of the self that have not been informed by a social identity (e.g., Turner, 1991). Although it is uncommon to think of autonomy and autonomous motivation as (in part) socially determined, when this is largely synonymous with self-determinism, but these need not be thought of as necessarily distinct. The ideas put forth through collective autonomy (Kachanoff, 2017) and MINSOH (Amiot et al., 2017) align with the idea of there being a possibility for individuality and sociality to be integrated. While these models focus on the autonomy or motivation experienced by an entire group, we

focus here on the autonomous motivation experienced by an individual as a result of a social process of internalisation. Self-determination theory seems to preclude that the choices that have been influenced by others may be intrinsically motivated (Deci & Ryan, 2000b), but this may be due to an unnecessarily narrow understanding of autonomy and the process of internalisation.

3.1.2. The Current Research

With three empirical studies, we develop and test a new scale, the Philosophically Informed Conceptualisation of Autonomous Motivation (PhICAM). This scale is based on the four subscales: Self-Governance, Volitional Resolve, Personal Self-Authorship and Social Self-Authorship. These different understandings of autonomous motivation represent different philosophical streams of what it means to be autonomous. Empirically investigating these different types of autonomy may shed light on the processes involved in making autonomously motivated decisions. Although there is no consensus in the philosophical debate about which form of autonomy is the one objective truth, the results from such an investigation may point to what people report as motivating themselves to autonomously behave sustainably. Our aim is not to provide a critical test of which understanding or conceptualization of autonomy is ‘correct’ per se, but rather to see how (empirically) valid the different conceptualizations are in understanding and predicting autonomous motivation and how this relates to behaviour, particularly in the environmental domain.

We posit that these conceptions of autonomy each exist as empirically distinct constructs. Although each subscale is a representation of autonomous motivation, we expect there to be a difference in how these are experienced for different people in different circumstances. As such, we expect to measure the subscales as separate and distinct subscales. Second, we hypothesise that different people will generally associate more or less with certain subscales of autonomous motivation, and these groups of people can be identified with a latent profile analysis. Third, we hypothesise that the subscales of the PhICAM scale relate to other commonly used measures associated with pro-environmental behaviour, including values and alternative understandings of autonomy and intrinsic motivation. Finally, we hypothesize that this scale of autonomous motivation predicts pro-environmental intentions and behaviours, over and above the variance explained by the measure of hedonism-inspired intrinsic motivation.

3.2. Study 1

3.2.1. Methods

3.2.1.1. Participants

A total of 197 participants were recruited from the United States panel of Amazon's mTurk to take part in an online questionnaire, which took an average of 10 minutes (*M* = 9.87 minutes, SD = 6.77) to complete. In total, 172 valid surveys were completed (85% success rate) in an average of roughly 618 seconds (*M* = 10.30 minutes, SD = 6.84); by 99 males and 72 females. Age ranged from 20 to 73 (*M* = 36.80 years old, SD = 11.53). About 4% of the sample did not report having completed any level of education qualification, 34% had completed primary up to high school level of education, 53% held a Bachelor's degree or equivalent and 12% had completed a Master's program or equivalent or above. The sample was supposed to consist only of the United States citizens, and 166 people (97%) indicated as such. Finally, some 3% did not report being US citizens, but instead reported being Indian (2), Italian (1), Polish (1), Serbian (1), Honduran (1), Hispanic (1) and White (5).

3.2.1.2. Materials

After successfully completing the informed consent page, the questionnaire included items on the respondents' intention, behaviour, our autonomous motivation measure (PhICAM), Motivation Towards the Environment Scale (MTES), Schwartz Values Scale, Social Comparison Scale, Index of Autonomous Functioning and demographics, in that order. This study was approved by the ethics board of the university, and participants were fully debriefed.

Intentions and actual behaviour.

Behaviours were selected and slightly adapted from a range of common and uncommon pro-environmental behaviours classified by Van der Werff, Steg and Keizer (2012). Participants were asked to indicate how often they intend and how often they actually engage in five pro-environmental behaviours on a 5-point Likert scale from never to always (Intentions: *M* = 3.55, SD = 0.77; Actual: *M* = 3.37, SD = 0.79). In both cases, the order of the behaviours was randomised to avoid ordering effects.

Table 3-1: Means and Standard Deviations of the Behavioural Measures

Behaviour	Intention (SD)	Actual (SD)
Minimizing unnecessary electricity consumption	4.02 (0.97)	3.83 (1.09)
Disposing of waste responsibly	3.75 (1.12)	3.58 (1.16)
Buying sustainable products	3.14 (1.08)	2.88 (1.18)
Minimizing water consumption at home	3.41 (1.19)	3.32 (1.26)
Reducing unnecessary consumption	3.41 (1.23)	3.22 (1.19)

Philosophically Informed Conceptualisation of Autonomous Motivation (PhICAM) Scale.

We included 20 items to measure the 4 types of autonomy (and one non-autonomous subscale) based on and adapted following a pilot study conducted with 39 participants. Respondents were asked to indicate, if they were to engage in a pro-environmental behaviour, why they would do so on a 7-point Likert scale (from 1 = Strongly Disagree to 7 = Strongly Agree). Table A1-1, in the appendix, gives an overview of the items reflecting the 5 sub scales of the measure: Self-Governance; Personal Self-Authorship; Social Self-Authorship; Volitional Resolve and non-autonomous (instrumental financial) items. Self-Governance was operationalised with items such as "… because it is the rational thing for everyone to do; Volitional Resolve with "… because I want to prioritize these behaviours"; Personal Self-Authorship with "… because I consider this to be in line with a goal I want to pursue"; and Social Self-Authorship with "… because others have helped me realize how important I think this is". The non-autonomous sub-scale included items such as "… because it is affordable". An additional item was included as an attention check in the same format as all other items of the scale.

The items were, again, randomised to avoid ordering effects. All items of the scale were presented to each participant two times: once for a behaviour pertaining to separating waste responsibly (glass and paper, in particular), and once for buying sustainable products (organic, fair trade and such). These behaviours were selected for being relatively straight forward and relatively more common and less common, respectively (van der Werff, 2012). By asking participants why they would engage in a behaviour, we can discern which reasons are important to people. As all statements are operationalisations of one of the four types of autonomous

motivation (or of the non-autonomous sub-scale), we can distinguish between the conceptions of autonomous motivation and use these sub-scales to predict behaviour.

Motivation Towards the Environment Scale.

Intrinsic motivation is commonly measured with the Motivation Toward the Environment Scale (MTES; Pelletier et al., 1998). Respondents completed a 24-item scale composed of questions pertaining to motivations for environmental behaviour ranging from intrinsic motivation (e.g., 'Because I like the feeling I get when doing things for the environment') to amotivation (e.g., 'I feel that doing something about the environment is a waste of time'), in line with the self-determination theory categorization of 6 different levels of motivation.

Schwartz' Values Scale.

Values were assessed by means of a short version of Schwartz's value scale (Schwartz, 1994) developed by De Groot and Steg (2008), including three items for hedonic values, as used by Van der Werff, Steg and Keizer (2013). Hedonic, egoistic, altruistic and biospheric values were assessed by asking participants to rate 16 values as guiding principles in their lives (on a scale of -1 = Opposed to my values, 0 = Not important at all, 7 = Extremely important). Respondents were asked to vary their answers, as typically only a few values are extremely important to people.

Social Comparison Scale.

Subsequently, participants completed a short Social Comparison measure developed by Gibbons and Buunk (1999). This scale was included to measure the extent to which participants tend to conform to social pressures or compare their actions with others. The short version includes one reverse scored item, which was rephrased to avoid confusion over ambiguous phrasing (from: "I am not the type of person who compares often with others" to "I am the type of person who rarely compares myself with others"). Items were answered on a 7-point Likert scale from Strongly disagree to Strongly agree.

Index of Autonomous Functioning.

The final scale participants were asked to complete was the Index of Autonomous Functioning (Weinstein, Przybylski & Ryan, 2012), with three sub-scales: Authorship/Self-congruence, Susceptibility to control and Interest taking. Although the Scale was not found to be particularly

consistent or successful in the pilot study (low Cronbach's alpha overall and for sub-scales, as well as not relating significantly to other constructs), it was left in the actual study as a benchmark to which our new PhICAM scale could be compared in terms of internal validity and relevance. Participants were asked to answer how true a collection of 15 statements (5 for each sub-scale) are for them on a 7-point Likert scale from Strongly disagree to Strongly Agree.

Demographics

Lastly, a few demographic questions were asked, including gender, age, nationality and education. Although all participants were expected to be from the United States as they were using the American mTurk service, this does not preclude from residents in the United states but without United states citizenship from participating. The level of education of participants was gauged by asking their highest level of attained education from 'No Qualifications', 'Primary (or equivalent)', 'Lower Secondary (or equivalent)', 'Higher Secondary (or equivalent)', 'Tertiary - College or Bachelor (or equivalent)', 'Tertiary - Master or PhD (or equivalent)'. See the Appendix for the items of each of the scales used.

3.2.1.3. Data Analysis

Most analyses in this chapter (and the rest of the dissertation) will be carried out in R, using the newest version of the software available at the time of analysis, unless otherwise specified.

Multiple Group Method

We opt to use the Multiple Group Method (MGM) to investigate the factor structure of the PhICAM scale. We choose the multiple Group Method (MGM) rather than the standard confirmatory factor analysis, as it is a simple, intuitive and effective alternative for a factor analysis (De Groot & Steg, 2008; Guttman, 1952; Henk et al., 2018). The benefit of the MGM method is that it is possible to calculate, using simple arithmetic, what the correlations of each item are to each of the sub-scales (the mean of all of the items in the subscale). In the case of calculating an item's correlation with the subscale that it belongs to, we correct for auto-correlation. For example, in order to calculate the MGM coefficients for item 1, for the subscales of Self-Governance, Personal Self-Authorship, Social Self-Authorship and Volitional Resolve, this simply requires calculating the correlation coefficient between item 1 and the mean of all the items of the subscales (e.g., mean of items 5-8 for Self-Governance). For the MGM for

item 1 and the non-autonomous subscale, in order to adjust for auto correlation, we calculate the mean of the subscale only including the other items of the subscale, in this case items 2-4.

Latent Profile Analysis

The latent profile analysis (tidyLPA analysis in R using the mclust package; Rosenberg et al., 2019) demonstrates whether there are different profiles or classes that participants can be categorised into based on their responses to the different PhICAM subscales.

By doing so we can show whether people differ fundamentally with regards to how important the different facets of autonomous motivation are for them when it comes to describing what motivates them to behave sustainably. It is possible that—as a latent profile analysis generally tries to show—some people are motivated most by one of the subscales, whereas other people are motivated more by another (see Figure 3-1, below). If this is the case, it would be a good indicator that future research and especially policy interventions aimed at sustainable behavioural change should target different people with different interventions depending on which type of autonomous motivation subscale (Self-Governance, Personal Self-Authorship, Social Self-Authorship or Volitional Resolve) they resonate with most.

In Figure 3-1, below, we show an idealised latent profile analysis plot demonstrating clearly defined profiles corresponding to the four PhICAM subscales. People are categorized as belonging to groups 1-4, which happen to correspond to Self-Governance, Personal Self-Authorship, Social Self-Authorship and Volitional Resolve, respectively. This indicates that people tend to agree significantly more with one of the subscales influencing their motivation to behave sustainably than the others. This situation, however, seems unlikely as we already know that the subscales do tend to correlate relatively strongly with one another, and that such a disjointed set of profiles is unlikely.

Alternatively, it is possible that no such clean and clear grouping exists, and that we cannot split participants into separate profiles at all as there may not be enough variability in the data to support the creation of four distinct groups (we always prefer to create four latent groups to accommodate the possibility of a disparate group corresponding to each of the subscales). It is also possible that roughly horizontal and parallel trend lines can be seen in our data, suggesting that people are merely more or less motivated to engage in sustainable behaviour for autonomous reasons, but with no noticeable difference between subscales. The most likely

situation, however, is that there will be some kind of combination of the scenarios, with some difference in how motivated people are, and that more motivated people may find different subscales more important overall than others and vice versa.

We will test for these exploratory hypotheses with latent profile analysis (Rosenberg et al., 2019) using the snowRMM package (Seol, 2022) in Jamovi (*The Jamovi Project, 2021*).

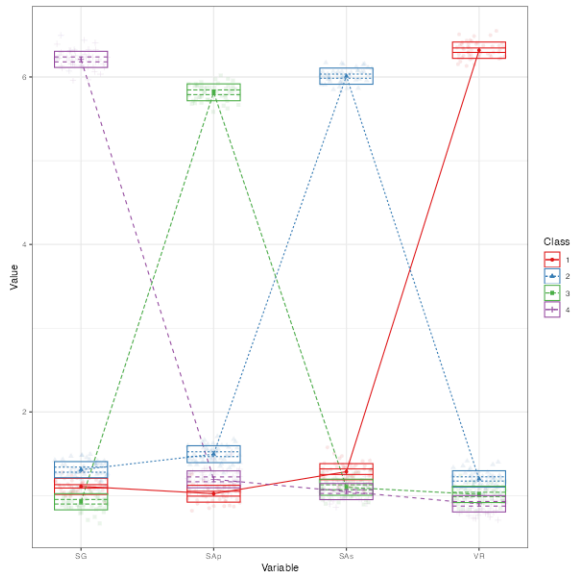


Figure 3-1: An idealised Latent Profile Analysis Plot

Regression

We also conducted OLS multiple regression analyses to model how much of the variation in behaviour can be explained by the PhICAM scale and other measures. This analysis will be conducted using the Tidyverse package in R (Wickham et al., 2019).

Gaussian Graphical Models

To supplement the regression analysis, we also visualise the correlations between the variables measured in this study with Gaussian Graphical Models. A Gaussian Graphical Model (GGM) depicts variables as circles like nodes in a network and lines connecting them representing the strength of their relationship (Epskamp et al., 2018; Lauritzen, 1996). If there is no line connecting two variables or items, this means that there is no relationship or that it is too weak to surpass a threshold. Critically, in the Gaussian Graphical Models we visualise the partial correlations, which is the unique correlation between the items after correcting for shared correlation with other items in the data. By using partial correlations, this avoids spurious correlations, alleviating issues of over specifying the model and suggesting relationships that do not exist (Bhushan et al., 2019).

A Gaussian Graphical Model (GGM) depicts a network of items or variables as circles, connected with lines that illustrate the strength of correlations between nodes in the network (Bhushan et al., 2019; Epskamp et al., 2018; Lauritzen, 1996). Stronger correlations between two variables are represented with thicker lines, and the absence of a line suggests a correlation coefficient below the minimal threshold. These lines can represent bivariate or partial corelations, but GGM are mostly used to demonstrate the unique shared variance between items or variables. These partial correlations control for all other variables in the set, and thereby avoid spurious correlations. In this study, the items are depicted individually to visualise statistical factor loadings and the interrelationships between items, as well as by sub-scale to visualise the network of variables, overall and by behaviour to capture any differences in uniquely shared variance between behaviours. These GGM will be visualized using the *qgraph* package (Epskamp et al., 2012), after applying the *glasso* algorithm (Friedman et al., 2015), following the same procedure as Bhushan and colleagues (2019). Nitin Bhushan was consulted prior to conducting the analyses to confer best practices.

3.2.2. Results

3.2.2.1. Multiple Group Method

Table 3-2, below, presents the corrected correlations for the loadings of items on the subscales of autonomy for waste separation and recycling in Study 1. The internal consistency of each of the sub-scales are high: Non-Autonomous (α = 0.91); Self-Governance (α = 0.75); Personal Self-Authorship (α = 0.89); Social Self-Authorship (α = 0.92); Volitional Resolve (α = 0.82).

Table 3-2: Multiple Group Method for Waste Separation and Recycling

Item	Subscale	Autonomy Sub-scale Clusters				
		Non-Autonomous	Self-Governance	Self-Authorship		Volitional Resolve
				Personal	Social	
Item 1	Non-Autonomous	***0.794***	0.203	0.099	0.490	0.194
Item 2		***0.842***	0.247	0.192	0.615	0.237
Item 3		***0.738***	0.314	0.232	0.548	0.294
Item 4		***0.801***	0.105	0.115	0.565	0.161
Item 5	Self-Governance	0.097	***0.558***	0.525	0.270	0.513
Item 6		0.104	*0.589*	**0.594**	0.248	**0.594**
Item 7		0.198	*0.533*	0.587	0.444	**0.661**
Item 8		0.316	***0.522***	0.498	0.426	0.499
Item 9	Personal Self-Authorship	0.156	0.620	***0.783***	0.388	0.769
Item 10		0.162	0.690	***0.785***	0.377	0.706
Item 11		0.215	0.595	***0.723***	0.400	0.655
Item 12		0.090	0.612	***0.757***	0.319	0.712
Item 13	Social Self-Authorship	0.561	0.395	0.345	***0.829***	0.468
Item 14		0.544	0.406	0.399	***0.809***	0.437
Item 15		0.597	0.407	0.383	***0.842***	0.447
Item 16		0.551	0.454	0.409	***0.790***	0.459
Item 17	Volitional Resolve	0.280	0.684	**0.694**	0.427	*0.628*
Item 18		0.155	0.523	**0.728**	0.342	*0.668*
Item 19		0.329	0.596	0.560	0.540	***0.599***
Item 20		0.025	0.591	0.665	0.303	***0.684***

Autocorrected correlations between items and subscales of PhICAM scale

The MGM analysis of the PhICAM scale for waste disposal and recycling shows that, overall, most items load on to their respective sub-scales as expected. In particular, the non-autonomous sub-scales and the personal and social dimensions of self-authorship seemed to load very well. Self-Governance and Volitional Resolve, however were less successful, with only two of the four items loading on the correct sub-scale in each case. Rather than

Self-Governance, item 6 (*… because it is the rational thing for everyone to do*) correlated highest with Personal Self-Authorship and Volitional Resolve equally; item 7 (*… because it is universally desirable*) correlates most highly with Volitional Resolve. For Volitional Resolve, the items that did not load as expected were items 17 (*… because I want to prioritize these behaviours*) and 18 (*… because this is what I really want to do in such situations*), both of which had stronger auto-corrected correlations with the Personal Self-Authorship subscale.

Table 3-3, below, presents the corrected correlations for the loadings of items on the subscales of autonomy for buying sustainable products in Study 1. The internal consistency of the sub-scales is high: Non-Autonomous (α = 0.96); Self-Governance (α = 0.85); Personal Self-Authorship (α = 0.9); Social Self-Authorship (α = 0.91); Volitional Resolve (α = 0.86).

Table 3-3: Multiple Group Method for Buying Sustainable Products

Item	Subscale	Autonomy Subscale Clusters				
		Non-Autonomous	Self-Governance	Self-Authorship		Volitional Resolve
				Personal	Social	
Item 1	Non-Autonomous	***0.894***	0.335	0.203	0.452	0.296
Item 2		***0.921***	0.388	0.272	0.516	0.360
Item 3		***0.903***	0.365	0.251	0.482	0.355
Item 4		***0.888***	0.344	0.176	0.496	0.288
Item 5	Self-Governance	0.295	***0.767***	0.691	0.537	0.748
Item 6		0.300	***0.723***	0.636	0.449	0.699
Item 7		0.320	***0.711***	0.602	0.539	0.659
Item 8		0.339	***0.564***	0.524	0.537	0.523
Item 9	Personal Self-Authorship	0.165	0.633	***0.804***	0.494	0.762
Item 10		0.262	0.690	***0.810***	0.569	0.808
Item 11		0.260	0.613	***0.788***	0.583	0.738
Item 12		0.143	0.642	*0.706*	0.527	**0.750**
Item 13	Social Self-Authorship	0.396	0.594	0.576	***0.832***	0.588
Item 14		0.490	0.560	0.522	***0.815***	0.535
Item 15		0.495	0.486	0.520	***0.813***	0.519
Item 16		0.435	0.558	0.577	***0.702***	0.588
Item 17	Volitional Resolve	0.290	0.736	**0.763**	0.526	*0.762*
Item 18		0.244	0.616	**0.754**	0.432	*0.691*
Item 19		0.440	0.663	**0.656**	0.667	*0.648*
Item 20		0.166	0.633	**0.771**	0.482	*0.745*
Autocorrected Correlations Between Autonomy Items and PhICAM Subscales						

For the MGM analysis of buying sustainable products, the results of the factor analysis are again mainly successful, but the trend is a little bit different. Non-Autonomous, Self-Governance and Social Self-Authorship subscales load exactly as expected. In this case, item 12 (… matters to me and who I aspire to be) of Personal Self-Authorship actually correlates strongest with Volitional Resolve. Interestingly, none of the items of Volitional Resolve correlate most strongly with their expected sub-scale. Rather, item 17 (… is what I want myself to want to do), 18 (… is something I genuinely care about) and 20 (… is what I choose to do after considering my preferences) load with Personal Self-Authorship. Item 19 (… is what I desire to do, more than the alternatives) loads on the social dimension of Self-Authorship.

3.2.2.2. Latent Profile Analysis

In Figure 3-2, below, we demonstrate the results of the latent profile analysis for both of the behaviours tested in this first study: a) waste separation/recycling on the left, and b) buying sustainably on the right. We restricted the model to 4 profiles per analysis of each behaviour, to allow for each of the subscales to be represented as dominant in a profile.

For waste separation and recycling, the main difference between the profiles is the average level of agreement with each of the subscales, with a profile for people with general high autonomous motivation (profile 4, n=80), medium motivation (profile 2, n=24), and low motivation (profile 1, n=15). The exception for this trend is profile 3 (n=53), for which the participants with this profile have high autonomous motivation related to each of the sub-scales, except for Social Self-Authorship, which is among the lowest recorded average for any subscale across any of the groups (M=2.22).

For buying sustainably, we see a very similar formation of profiles, with a generally high (profile 2, n=64), medium (profile 1, n=60), and low (profile 3, n=24) autonomous motivation profiles. There is, again, also a profile with a similar pattern of relatively high autonomous motivation for Self-Governance, Personal Self-Authorship and Volitional Resolve, but low autonomous motivation for Social Self-Authorship (M=2.98, profile 4, n=24).

Table 3-4: Latent Profile Analysis Study 1, Profile Means and SDs

Profile	N	SG (SD)	SAp (SD)	SAs (SD)	VR (SD)
1	15	3.60 (1.08)	2.93 (1.24)	1.78 (0.737)	2.97 (0.891)
2	24	5.75 (0.837	6.06 (0.652)	2.22 (0.886)	5.80 (0.667)
3	53	4.59 (0.699)	4.63 (0.672)	4.05 (0.717)	4.53 (0.641)
4	80	5.90 (0.618)	6.05 (0.559)	5.47 (0.775)	5.92 (0.566)

a) Waste separation and recycling

Profile	N	SG (SD)	SAp (SD)	Sas (SD)	VR (SD)
1	60	4.41 (0.676)	4.58 (0.538)	3.87 (1.03)	4.47 (0.525)
2	64	5.77 (0.713)	6.02 (0.596)	5.48 (0.786)	5.95 (0.535)
3	24	2.72 (1.18)	2.61 (1.06)	1.94 (0.828)	2.66 (0.786)
4	24	5.07 (0.524)	5.69 (0.468)	2.98 (1.12)	5.54 (0.395)

b) Buying Sustainably

* Values in parentheses are standard deviations

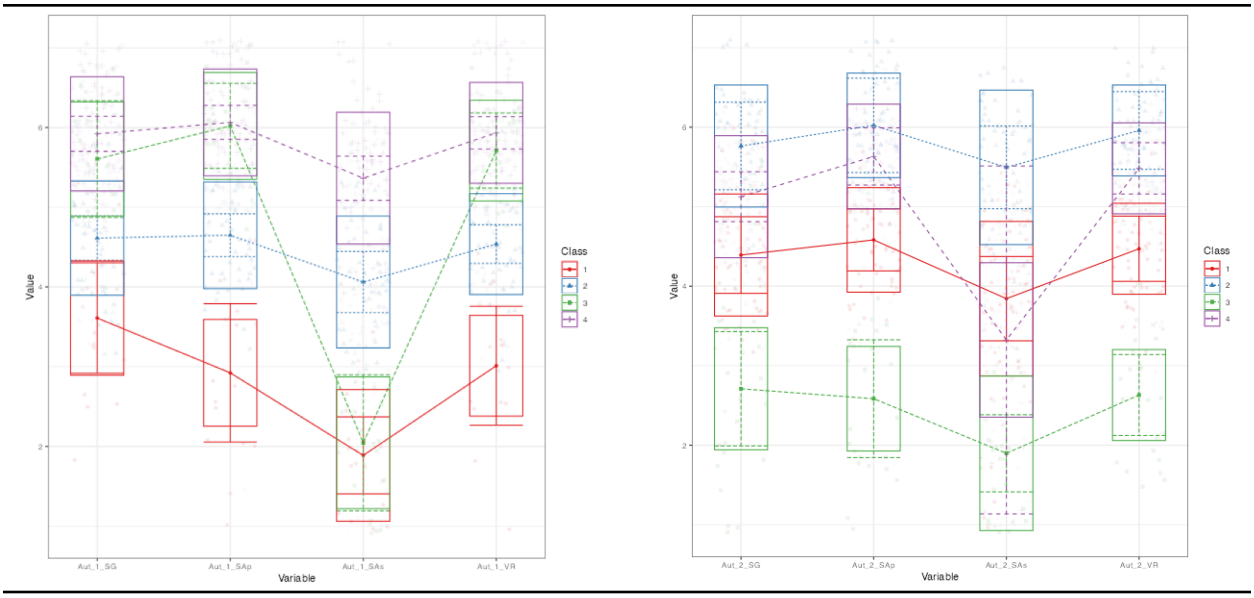


Figure 3-2: Latent Profile Analysis Study 1

3.2.2.3. Regressions

The factor analysis above is a good indication of how well the underlying concepts of autonomy correlate with each other. Equally interesting, however, is how well such a scale can actually explain variation in or predict pro-environmental behaviour. First, we tested the minimal model, including only the sub-scales of the PhICAM measure to predict Intentions for the respective behaviour and the PhICAM sub-scales together with Intentions to predict Actual behaviour, each conducted separately for Waste Recycling and Sustainable Buying. An overview of these models is included below, with full regression tables for each model in the appendix.

The regression analysis below (Regression model 1, Table 3-5) shows that for recycling waste ($F(5,166)=7.94$, $p<.001$, $R^2=.19$) the only significant predictor of intentions to recycle waste is Self-Governance (b=0.24, *p*=.043, 95% CI [0.01,0.47]). Actual waste recycling behaviour ($F(6,165)=8.69$, $p<.001$, $R^2=.24$) is predicted by non-autonomous (financial) motivation (b=0.23, *p*=.001, 95% CI [0.10,0.35]), as well as Self-Governance (b=-0.25, *p*=.044, 95% CI [-0.49,-0.01]) and Social Self-Authorship (b=0.16, *p*=.035, 95% CI [0.01,0.31]), as shown in model 2 of Table 3-5.

Table 3-5: Regression results for simple models, Study 1

	(1) Waste Intentions	(2) Waste Behaviour	(3) Buying Intentions	(4) Buying Behaviour
Intercept	1.31**	1.17*	2.26***	0.31
Intentions		0.15^		0.04
Non-Autonomous	0.01	0.23**	-0.05	0.20***
Self-Governance	0.24*	-0.25**	0.03	-0.11
Personal Self-Authorship	0.08	0.18	-0.13	0.23^
Social Self-Authorship	-0.10	0.16**	-0.07	0.10
Volitional Resolve	0.22^	-0.01	0.50**	0.13
df	5, 166	6, 165	5, 166	6, 165
F-Statistic	7.94***	8.69***	5.99***	14.17***
R-Squared	0.19	0.24	0.15	0.34

*** p < .001, ** p < .01, * p < 0.05, ^ p < 0.1

Model 3 of Table 3-5 shows that for buying sustainable products ($F(5,166)=5.99$, $p<.001$, $R^2=.15$) the only significant predictor of intentions to buy sustainably is for Volitional Resolve (b=0.50, *p*=.001, 95% CI [0.21,0.80]). Finally, model 4 shows that with respect to the actual behaviour associated with buying sustainably ($F(6,165)=14.17$, $p<.001$, $R^2=.34$), only

non-autonomous (financial) motivation significantly predicts buying sustainably (b=0.20, p<.001, 95% CI [0.10,0.30]).

Table 3-6 shows the full regression models predicting general sustainable intentions (the mean of all sampled sustainable behaviours), and general actual sustainable behaviour (the mean of all sampled sustainable behaviours), and the three self-determined subscales of the Motivation Toward the Environment Scale. Model 1 predicts participants' average sustainable intentions, using the mean of individuals' responses for waste recycling and buying sustainably PhICAM subscales, MTES, values, social comparison, IAF and demographics as predictors ($F(19,152)=4.848$, $p<.001$, $R^2=.37$). This model demonstrates that the non-autonomous subscale of PhICAM is a significant predictor (b=0.10, p=.046), as are biospheric values (b=0.13, p=.028). Model 2 predicts actual behaviour, using intentions, PhICAM, MTES, values, IAF, Social Comparison and demographics as predictors, and explains a lot of variance ($F(20,151)=20.66$, $p<.001$, $R^2=.73$). Only intentions (b=0.73, p<.001), non-autonomous PhICAM (b=0.09, p=.011), IAF (b=.21, p=.049) and age (b=0.01, p=.008) are significant predictors.

Finally, Table 3-6, also shows the full model predicting the three self-determined motivation subscales of the MTES (Intrinsic, Integrated and Identified motivation) with the PhICAM Scale, Values, Social Comparison Scale, the Index of Autonomous Functioning, and Demographics. The key results are that the strongest predictor of Intrinsic Motivation ($F(13,158)=15.66$, p<.001, $R^2=.56$) is Personal Self-Authorship (b=.64, p<.001), followed by biospheric values (b=.16, p=.019), age (b=.01, p=.034) and Self-Governance (b=.25, p=.043). Integrated motivation ($F(13,158)=27.81$, p<.001, $R^2=.70$), is predicted by biospheric values (b=.34, p<.001), the index of autonomous functioning (b=.46, p=.008), Personal Self-Authorship (b=.26, p=.020), hedonic values (b=-.11, p=.028) and altruistic values (b=-.12, p=.035). Finally, identified motivation ($F(13,158)=29.99$, $p<.001$, $R^2=.71$), is predicted by Personal Self-Authorship (b=0.53, p<.001), the non-autonomous subscale of autonomy (b=-.20, p<.001), biospheric values (b=.20, p<.001), the social comparison scale (b=.17, p<.001), Self-Governance (b=.29, p=.002) and Social Self-Authorship (b=-.14, p=.017).

Table 3-6: Regression results for full models, Study 1

Predictor	(1) Intentions	(2) Actual Behaviour	(3) MTES: Intrinsic Motivation	(4) MTES: Integrated Motivation	(5) MTES: Identified Motivation
Intercept	1.07	-0.80	-0.85	-1.07	0.77
Intentions		0.73***			
Non-Autonomous	0.10*	0.09*	0.00	-0.05	-0.20***
Self-Governance	-0.04	-0.05	0.25*	0.16	0.29**
Personal Self-Authorship	0.10	0.01	0.64***	0.26*	0.53***
Social Self-Authorship	-0.03	0.00	0.07	0.06	-0.14*
Volitional Resolve	0.21^	-0.02	-0.28^	0.25^	-0.07
MTES Intrinsic	0.01	-0.05			
MTES Integrated	0.04	0.07			
MTES Identified	-0.01	0.06			
MTES Introjected	-0.04	0.01			
MTES External	0.00	0.02			
MTES Amotivation	-0.00	0.03			
Values Bio	0.13*	0.03	0.16*	0.34***	0.20***
Values Hed	0.01	-0.03	-0.03	-0.11*	-0.02
Values Ego	-0.08^	0.00	0.07	-0.02	-0.03
Values Alt	-0.02	-0.04	-0.06	-0.12*	0.00
Social Comparison	0.05	-0.01	-0.01	0.03	0.17***
IAF	0.13	0.21*	0.27	0.46**	0.15
Gender	-0.16	-0.04	0.08	-0.01	-0.02
Age	0.00	0.01**	0.01*	-0.01	0.00
df	19, 152	20, 151	13, 158	13, 158	13, 158
F-Statistic	4.848***	20.66***	15.66***	27.81***	29.99***
R-Squared	0.37	0.73	0.56	0.69	0.71

*** p < .001, ** p < .01, * p < 0.05, ^ p < 0.1

3.2.2.4. Gaussian Graphical Modelling

Items

First, the GGM was plotted for the items of the PhICAM scale for both behaviours, together with the self-reported intentions and actual pro-environmental behaviours (Figure 3-3, below). The blue clusters illustrate the behaviours: light blue for Intentions, dark blue for Actual behaviour. Items 1-5 and 6-10 represent *Minimizing unnecessary electricity consumption, Disposing of waste responsibly, Buying sustainable products, Minimizing water consumption at home, Reducing unnecessary consumption*, each in that order. Green dots represent the average responses across both measured behaviours for items for non-autonomous monetary incentives; red for Self-Governance; oranges for Personal Self-Authorship; purples for Social Self-Authorship; and beige/brown for Volitional Resolve (in each case light is for waste, dark for buying). Generally, the intentions and actual behaviour and the non-autonomous items seem to be the cleanest most distinct clusters, followed closely by Social Self-Authorship. The remaining conceptions of autonomy seem to be less distinct, illustrated by their closer proximity and more ties between the items of different sub-scales. This goes to show that there are unique relationships (partial correlations) that explain variance not explained by the rest of the model. In an ideal scale, the clusters would be more distinct, but this may be a realistic consequence of developing a scale from philosophical theory rather than from observed behaviour.

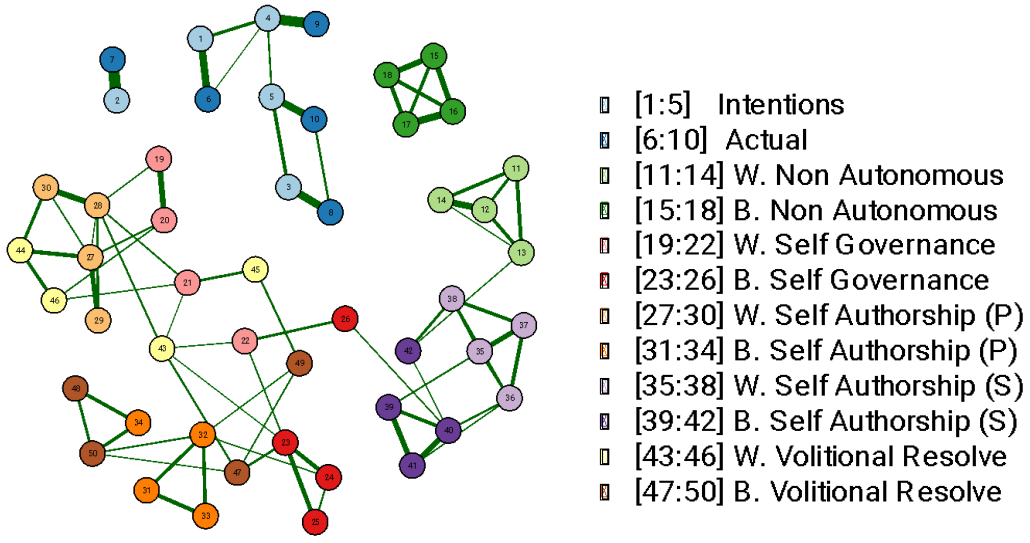


Figure 3-3: Gaussian Graphical Model for all behaviour and autonomy items, Study 1

Scales

Next, a GGM was plotted for the different scales that were completed by the participants to determine if, and to what extent, there may be underlying relationships between the conceptions of autonomy and other scales that explain variance in the intentions and actual self-reported PEB. From *Figure 3-4*, below, it is clear that the strongest relationships (most unique variance explained between any two (sub-)scales is between the intentions and actual behaviour, between altruistic and biospheric values (as is to be expected), and between external and amotivation (the two least autonomous subscales of the MTES measure). Following these three theoretically justified strong relations, the next strongest related pair (given by the thickness of the tie between them) is between personal self- authorship and Volitional Resolve.

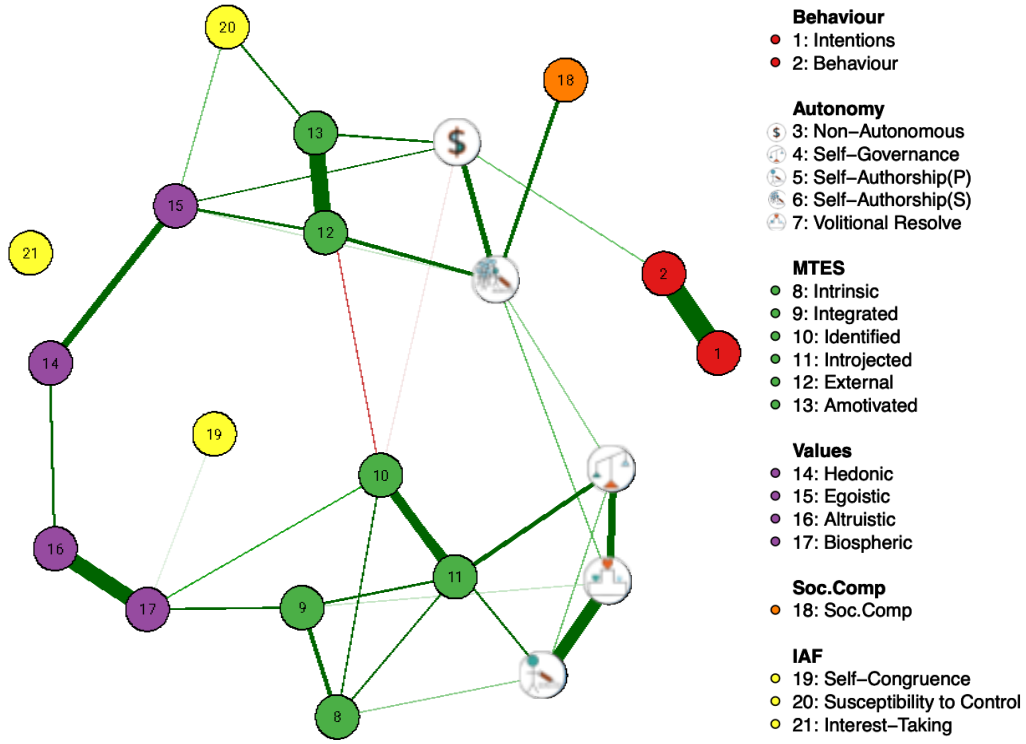


Figure 3-4: Gaussian Graphical Model, Average Across Behaviours

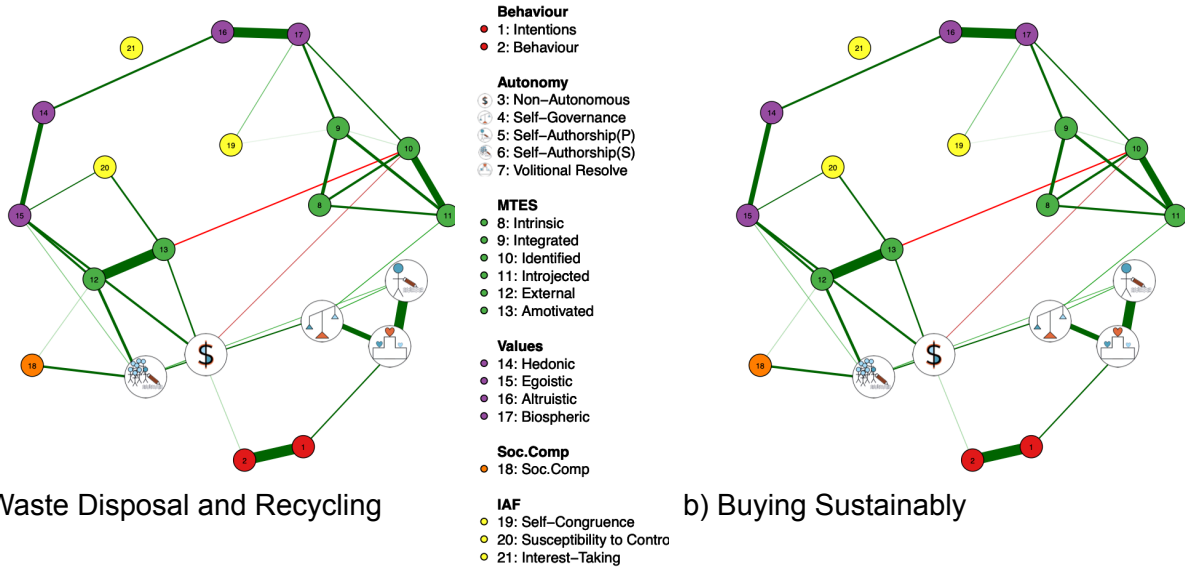
More interesting, however, is that, just as with the items GGM, above, there seem to be two clusters of PhICAM sub-scales: non-autonomous & Social Self-Authorship and Self-Governance, Personal Self-Authorship & Volitional Resolve. There are (weaker, yet) significant ties between social self- authorship and Self-Governance & Volitional Resolve, which is promising.

Additionally, there seems to be a connection between the PhICAM scale and the MTES scale, in that each PhICAM sub-scale has a significant tie to one of the MTES sub-scales. The non-autonomous items significantly partially correlate with amotivation (the lowest level of autonomous behaviour); social self- authorship partially correlates with external motivation; Self-Governance partially correlates with introjected motivation; Volitional Resolve partially correlates (though weakly) with integrated motivation; and Personal Self-Authorship partially correlates with intrinsic motivation. Identified motivation does not partially correlate directly with any of the PhICAM subscales, but does partially correlate with introjected motivation, intrinsic motivation and negatively with external motivation.

Another result of this GGM is that, the social comparison scale partially correlates with Social Self-Authorship. Given that Social Self-Authorship has a focus on social influence, social identity and internalisation, it is not surprising that of all PhICAM measures it would correlate with social self- authorship, but something to reflect on later. Similarly, the susceptibility to control facet of the Index of Autonomous Functioning scale partially correlates with the altruistic values subscale and with the amotivation subscale of MTES. The other two facets of the IAF scale do not seem to correlate with many other measures observed, except for a very faint (weak) tie between self-congruence and biospheric values.

Behaviours

Finally, a GGM was plotted to compare the relationships (network) of partial correlations of the scales between different pro-environmental behaviours. Two similar plots were made, one for responsible waste disposal and one for sustainable buying practices to see how having different conceptions of autonomy may affect people's behaviour differently in different behavioural domains, see Figure 3-5, below. The layout of the network was fixed to be the same for both plots, resulting in two similar images for the different behaviours. What is different, however, are the ties between the different variables, and the strength thereof, in some instances. Most notably, the intentions and actual behaviour nodes are not significantly partially correlated with any other measures in the case of waste separation, but with sustainable buying, the intentions are partially correlated with Volitional Resolve, and actual behaviour is correlated with Non-Autonomous financial motives.



a) Waste Disposal and Recycling

b) Buying Sustainably

Figure 3-5: Gaussian Graphical Models comparing the relationships between scales for both behaviours

The PhICAM measures of autonomy are also differently related to other variables, besides the intentions and behaviours people report. Apart from being correlated with actual behaviour, NA has a weaker relationship with Social Self-Authorship, and a new unique correlation with Egoistic values for the sustainable buying graph as compared to the waste disposal graph. Self-Governance, on the other hand has weaker ties to introjected motivation and Personal Self-Authorship for sustainable buying than waste disposal, while the connection to NA and VR seem to be stronger. Other than the strength of the ties, the variable seems to behave similarly. Personal Self-Authorship is significantly and positively related to Social Self-Authorship in the case of sustainable buying, whereas this is not the case for waste disposal (or for the non-behaviour-specific model, see Figure 3-4). Additionally, in the case of SAp, identified motivation and the self-congruence subscale of IAF are significantly correlated for waste disposal but not for sustainable buying. For the social dimension of self-authorship, the described positive relation to Personal Self-Authorship is unique to sustainable buying just as the positive relation to Volitional Resolve is unique for waste disposal. Finally, in the case of sustainable buying, social self- authorship has a significant partial correlation with egoistic values. The last dimension of the PhICAM scale, Volitional Resolve, has been described to have different relations to behavioural intentions and to Social Self-Authorship. Additionally, for the case of waste disposal, Volitional Resolve is positively correlated with introjected motivation,

whereas for sustainable buying this relation disappeared, but a significant correlation for integrated motivation was found instead.

Finally, some of the non PhICAM (sub-)scales were also found to have different relations for the different behaviours. For sustainable buying, integrated motivation was found to have a significant relation to identified motivation and self-congruence (IAF), which were both absent for waste disposal. Apart from a relation to integrated motivation, identified motivation also featured a negative relation to the non-autonomous sub-scale of PhICAM in the case of sustainable buying, as indicated earlier. Introjected motivation was, again, found to have a relation to Volitional Resolve for waste but not for buying sustainably. Egoistic values are the only values that seem to relate differently for the different behaviours: there is a positive relation of egoistic values to social comparison for waste disposal only, while there is a positive and significant relation between egoistic values and both Non-Autonomous & Social Self-Authorship in the case of buying sustainably.

Overall the models look rather similar (in part because they were forced to have the same layout), but there are striking differences as well. A test of model comparison was performed on the two models to see if these differences identified were enough to say that the structure of the gaussian graphical model is significantly different for the two behaviours but this was found not to be the case (M=0.00, p=1.00, S=0.00, p=1.00).

3.2.3. Discussion Study 1

Study 1 aimed to investigate the effectiveness, validity and reliability of the Philosophically Informed Conceptualisation of Autonomous Motivation (PhICAM) Scale. Specifically, to investigate the first hypothesis, we tested the factor structure of the scale using the Multiple Group method, expecting to find that each of the four items of each subscale correlate more strongly with the other three items of their subscale than with any other subscale. This analysis demonstrated that overall, the scale's subscales work reasonably well as individual sub-scales and that these subscales are clearly related to an overarching concept of autonomy, as demonstrated by their high inter-correlation. Although some items tended to correlate more strongly with other subscales than intended, this is not necessarily an indication of superfluous conceptualisation or of improper operationalisation and may be due to the related nature of the subscales.

In particular, it seems that Volitional Resolve does not work as well as an individual sub-scale as the rest, but this may be primarily due to the high inter-subscale correlations. The alphas for Volitional Resolve are sufficiently high ($\alpha = 0.82$ and $\alpha = 0.86$, for waste recycling and buying sustainably, respectively). With auto-corrected correlations of 0.60 or higher for each item, the strength of the construct is sufficient, but also happens to relate to the other constructs even more strongly. This may, in turn, be due to the more complex nature of Volitional Resolve, and the intricacies of operationalising the items in a way that adequately conveys the hierarchical nature of the desires to be considered. These items should be revisited to attempt to make them more unmistakably indicative of Volitional Resolve, and less ambiguous regarding other subscales. Additionally, although the subscale of Social Self-Authorship empirically performed well ($\alpha = 0.92$ and $\alpha = 0.91$, for waste recycling and buying sustainably, respectively), some items were developed to make sense in line with social identity theory, perhaps more so than warranted and at the expense of the conceptual coherence of the subscale.

There is also a noticeable difference in the results of the MGM factor analysis for the two different behaviours surveyed. For example, all four items of Self-Governance load most strongly on the correct subscale for buying sustainable products, only two items load on Self-Governance in the case of waste disposal and recycling, and with lower auto-corrected correlations (between $r=0.52$ and $r=0.59$ for waste disposal and recycling compared to autocorrected correlations between $r=0.56$ and $r=0.77$ for sustainable buying). This suggests that there may be a difference in the importance of autonomy for different behaviours, as items

expected to elicit similar responses may not correlate as highly. This conjecture is more adequately evaluated in the regression analyses.

The Latent Profile Analysis demonstrated that people tend to differ predominantly in their degree of autonomous motivation overall, rather than having very different levels of autonomous motivation for different subscales. This is to say that people may be more or less autonomously motivated, but this level tends to be similar across subscales. The exception to this, however, is that for both waste recycling and for buying sustainably, there was one profile that emerged showing a much lower level of Social Self-Authorship than the other subscales of autonomous motivation. Generally, the level of autonomous motivation for the other subscales was as high as the most autonomously motivated, but only Social Self-Authorship was significantly lower, perhaps indicating that the people in this profile experienced Social Self-Authorship as less autonomous, or did not experience Social Self-Authorship at all.

The Gaussian Graphical Models demonstrated how the different PhICAM subscales (and all other sampled subscales) interact. The partial correlations between the different PhICAM subscales shows how much more similar Social Self-Authorship is to the non-autonomous subscale in terms of unique shared variance than the rest of the subscales. Additionally, while the non-autonomous subscale understandably correlates most strongly with amotivation (from the MTES scale), Social Self-Authorship correlates most strongly with the external motivation subscale of the MTES scale. Meanwhile, the other subscales of autonomous motivation (Personal Self-Authorship, Self-Governance and Volitional Resolve) all correlate most strongly with the more autonomous subscales of the MTES scale. Given that Social Self-Authorship is meant to be experienced as autonomous, this may indicate that the operationalisation of the items of this subscale are not entirely in line with the conceptualisation of the construct upon which it is based. Other than this, it is interesting to see that when the behaviours are taken together, the GGM shows that the only significant partial correlation between intrinsic motivation subscale from the MTES scale and the PhICAM scale is with the Personal Self-Authorship subscale. Additionally, the GGM models depicting the two different behaviours side-by-side show that for different behaviours (waste disposal and buying sustainably), the only MTES subscale to have a significant partial correlation with any of the PhICAM subscales is between introjected motivation and Self-Governance.

The regression analyses demonstrated that Self-Governance is predictive of waste separation and recycling intentions, whereas only Volitional Resolve predicts intentions for buying

sustainable products. With regards to actual recycling behaviour, and controlling for intentions, however, the non-autonomous, instrumental items of the subscale and Social Self-Authorship positively predict waste separation, but Self-Governance negatively predicts recycling waste. These results should be interpreted with caution as the Self-Governance subscale correlated most strongly with the Volitional Resolve subscale for two items in the case of waste separation and recycling. Similarly, for buying sustainable products, only the non-autonomous PhICAM subscale predicts behaviour significantly.

Interestingly, for the sake of understanding what role autonomy plays in predicting or explaining variance in intrinsic motivation, a multivariate regression analysis was performed for the first three subscales of the Motivation Toward the Environment Scale. In each case, Personal Self-Authorship significantly predicted motivation, as did biospheric values, but other subscales of autonomy also significantly predicted variance for one or some of the subscales, including Self-Governance and Social Self-Authorship. This indicates that although Personal Self-Authorship may be the best individual subscale to predict all forms of motivation, difference conceptions of self-determined motivation are additionally predicted by different philosophical conceptualisations of autonomy.

Regarding the prediction of the indexed measure of all the actual behaviours for the surveyed pro-environmental behaviours, the PhICAM scale did not significantly predict behaviours, although this may be due to the more specified nature of the autonomy scale, surveyed for only two of the 5 behaviours. As the responses vary significantly for waste recycling and buying sustainably, it makes sense that the autonomy experienced for these behaviours may not adequately predict all pro-environmental behaviour.

Study 1 showed that, for the most part, we can empirically distinguish the different subscales of autonomy from the philosophical literature. Additionally, these subscales of autonomy all seem to play a unique role in predicting different forms of self-determined motivation, intentions and behaviour. Improving the quality of the scale (conceptually rigour with an empirically sound factor structure) is an important next iterative step in developing the autonomous motivation scale further. Additionally, the question arises why such a different pattern is found for waste recycling and buying sustainable products, both for the MGM factor analysis, the GGM representation and for the regression analysis. Whether this can be explained by the easier or more difficult and more or less common nature of the behaviours will be addressed in the next study.

3.3. Study 2

Study 2 primarily aimed to replicate the findings of Study 1 after some improvements made to the scale following the results of the first study. Second, we tested whether the differences observed in Study 1 for the predictive power of waste separation and buying sustainably were due to these behaviours differing with regards to how easy to perform and common these behaviours are perceived to be. Van der Werff and colleagues (2013) found a significant difference between easier and more common behaviours compared to more difficult and less common behaviours with respect to the frequency people engage in them. This is further corroborated by studies that show that difficulty of behaviours moderates the relationship between self-determined motivation and sustainable behaviour (Green-Demeirs et al., 1997). In this study, we wanted to investigate whether this perception of ease and commonality may influence how autonomous one feels when engaging in the behaviour.

3.3.1. Methods

3.3.1.1. Participants

A total of 292 participants were recruited from a pool of first year psychology students to take part in an online questionnaire, which took an average of 17 minutes to complete (*M* = 17.23, SD = 14.66) after trimming the data to exclude the extreme 2.5% (duration was 92.97 minutes, SD = 686.76, before trimming due to some outliers). After successfully completing the informed consent page, the questionnaire included questions about pro-environmental behaviours, the PhICAM scale, a number of alternative intrinsic motivation questions, the motivation toward the environment scale, the Index of Autonomous Functioning, Values, the Social Comparison Scale, and demographics, in that order. This study was approved by the ethics board of the university and participants were fully debriefed at the end.

In total, 245 valid surveys were completed (84% success rate) in an average of roughly 19 minutes (*M* = 18.99, SD = 24.84 after trimming the data to exclude the extreme 2.5%) by 67 males and 174 females. Age ranged from 17 to 40 (*M* = 20.15 years old, SD = 2.22). The sample was recruited from the Dutch and English taught Psychology Bachelor student pool (2019-2020) at the University of Groningen, in the Netherlands. The overwhelming majority was either Dutch (130, 53.06%) or German (75, 30.61%).

3.3.1.2. Materials

Intentions and actual behaviour.

As in Study 1, participants were asked to indicate how often they intend and how often they actually engage in five pro-environmental behaviours on a 7-point Likert scale from never to always (Intentions: *M* = 5.15, SD = 0.96; Actual: *M* = 4.63, SD = 0.96). Additionally, in this study, we also asked participants how easy to perform they perceived the behaviours to be (Easy: *M* = 5.22, SD = 0.87) and how commonly performed these behaviours are (Common: *M* = 4.39, SD = 0.93). In each case, the order of the behaviours was randomised to avoid ordering effects.

Table 3-7: Means and Standard Deviations of the Behavioural Measures

Behaviour	Intention (SD)	Actual (SD)	Easy (SD)	Common (SD)
Minimizing unnecessary electricity consumption	5.54 (1.33)	5.17 (1.54)	4.91 (1.43)	6.25 (1.06)
Disposing of waste responsibly	5.74 (1.23)	5.33 (1.57)	5.08 (1.39)	5.36 (1.4)
Buying sustainable products	4.64 (1.48)	3.80 (1.43)	3.60 (1.31)	3.91 (1.53)
Minimizing water consumption at home	4.35 (1.52)	3.82 (1.52)	3.93 (1.44)	5.19 (1.4)
Reducing unnecessary consumption	5.48 (1.37)	5.04 (1.36)	4.44 (1.46)	5.38 (1.45)

Philosophically Informed Conceptualisation of Autonomous Motivation (PhICAM) Scale

We included an updated version of the 20-item scale developed in Study 1, with changes implemented to the way the question was asked and to the items that are expected to load onto the different autonomy sub-scales. The phrasing of the prompt of the scale was made more direct as it has been shown that people tend not to be particularly good at reporting which underlying processes play which role in determining whether to engage in a behaviour (Steg, 2016). Rather, participants are usually more able to report what they agree with, and this, indirectly, acts as a proxy for evaluations about the role a consideration plays in deciding to engage in a behaviour. Respondents were asked to indicate to what extent they agree with the following statements, "… considering the extent to which a choice you make is influenced by the following dimension", on a 7-point Likert scale (from 1 = Strongly Disagree to 7 = Strongly Agree).

The items were phrased such that they would complete the leading question, e.g., “Disposing of waste responsibly, e.g., bringing glass bottles to the recycling bin & separating paper from waste…” as follows: “… is financially attractive” (Non-autonomous); “… is the reasonable thing for everyone to do” (Self-Governance); “… matters to me and who I aspire to be” (Personal Self-Authorship); “… is a common goal of the members of groups I identify with” (Social Self-Authorship); “… is something I genuinely care about” (Volitional Resolve).

Table A1.2, in the appendix, gives an overview of the items reflecting the 5 sub scales of the measure of autonomous motivation. An additional item was included as an attention check in the same format as all other items of the scale. The items were, again, randomised to avoid ordering effects. All items of the scale were presented to each participant twice, once for separating waste (i.e., recycling, a relatively easy and common behaviour) and once for the behaviour of minimising water use, for example by taking shorter showers (a typically more difficult and less common sustainable behaviour; Van Der Werff et al., 2013).

Intrinsic Motivation.

In Study 2, we included some other measures that have been used in the environmental psychology literature on intrinsic motivation (Sharpe, 2022; Zeiske, 2021). In order to not only evaluate the success and usefulness of our new scale by comparing and contrasting it to the Motivation Toward the Environment Scale (MTES, a Self-Determination theory measure; Pelletier et al., 1998), this measure captures different facets of intrinsic motivation more generally, including items related to the hedonic component of intrinsic motivation (“enjoyable”, “pleasurable”) and the eudemonic component (“meaningful”, “purposeful”), as suggested by Zeiske (2021), and some more general items, grouped under Miscellaneous Intrinsic Motivation, (“sensible”, “in line with my principles”, “important”, “the right thing to do”) in line with the operationalisation of Sharpe (2022).

Other Measures

We used the same Motivation Toward the Environment Scale, Index of Autonomous Functioning instrument, Values measure and Social Comparison Scale as in Study 1. Lastly, a few demographic questions were asked pertaining to gender, age and nationality.

3.3.2. Results

3.3.2.1. Multiple Group Method

Table 3-8, below, presents the corrected correlations for the loadings of items on the subscales of autonomous motivation for waste separation and recycling in Study 2. The Internal consistency of the sub-scales are reasonably high: Non-Autonomous (α = 0.69); Self-Governance (α = 0.83); Personal Self-Authorship (α = 0.83); Social Self-Authorship (α = 0.89); Volitional Resolve (α = 0.79).

Table 3-8: Multiple Group Method Study 2, Waste Separation and Recycling

Item	Subscale	Autonomy Subscale Clusters				
		Non-Autonomous	Self-Governance	Self-Authorship		Volitional Resolve
				Personal	Social	
Item 1	Non-Autonomous	***0.578***	0.145	0.312	0.222	0.238
Item 2		***0.592***	0.234	0.271	0.217	0.300
Item 3		*0.253*	**0.468**	0.296	0.349	0.351
Item 4		***0.468***	0.247	0.321	0.194	0.279
Item 5	Self-Governance	0.253	***0.711***	0.431	0.444	0.512
Item 6		0.308	***0.648***	0.431	0.378	0.548
Item 7		0.327	***0.592***	0.580	0.517	0.578
Item 8		0.311	***0.661***	0.446	0.435	0.485
Item 9	Personal Self-Authorship	0.307	0.365	***0.631***	0.510	0.589
Item 10		0.383	0.521	*0.687*	0.633	**0.726**
Item 11		0.301	0.531	*0.641*	0.522	**0.655**
Item 12		0.377	0.502	*0.675*	0.536	**0.696**
Item 13	Social Self-Authorship	0.270	0.474	0.569	***0.794***	0.554
Item 14		0.316	0.488	0.590	***0.777***	0.590
Item 15		0.234	0.411	0.493	***0.785***	0.473
Item 16		0.353	0.528	**0.682**	*0.665*	0.631
Item 17	Volitional Resolve	0.257	**0.572**	0.498	0.425	*0.524*
Item 18		0.385	0.505	**0.798**	0.598	*0.653*
Item 19		0.337	0.531	0.636	0.502	***0.671***
Item 20		0.285	0.461	**0.609**	0.498	*0.569*

Correlations between autonomy items and autonomy subscales, corrected for auto-correlation
Values in italics are those values that are expected to be the highest correlation for that item, given that the item corresponds to that sub-scale.
Values in bold are the values with the highest correlations to a subscale per item

The only factor for which each of the intended items actually load most strongly onto the expected subscale is Self-Governance; all others have at least some "*wrong*" factor loadings. Non-autonomous, as expected, generally performs quite well, as the correlation coefficients to other sub-scales are all quite low – all except for item 3 (… is affordable), which loads highest

on the Self-Governance sub-scale. Personal Self-Authorship performs rather unexpectedly and items 10, 11 and 12 (… is in line with how I choose to live my life, … represents a goal I want to pursue, and … matters to me and who I aspire to be, respectively) load highest onto Volitional Resolve. Social Self-Authorship performs well, but item 16 (… matters to me, just as it matters to people who inspire how I want to live) only barely loads higher onto Personal Self-Authorship than the intended Social Self-Authorship. Volitional Resolve, as was the case in Study 1, performs seemingly poorly, with item 17 (… is what I want myself to want to do) loading onto Self-Governance, and items 18 and 20 (… is something I genuinely care about, and … is what I choose to do after considering my preferences, respectively) load onto Personal Self-Authorship.

Table 3-9: Multiple Group Method Study 2, Reducing Water Consumption

Item	Subscale	Autonomy Subscale Clusters				
		Non-Autonomous	Self-Governance	Self-Authorship		Volitional Resolve
				Personal	Social	
Item 1	Non-Autonomous	***0.724***	0.139	0.196	0.190	0.262
Item 2		***0.777***	0.144	0.229	0.249	0.261
Item 3		***0.717***	0.229	0.234	0.241	0.327
Item 4		***0.492***	0.183	0.145	0.092	0.155
Item 5	Self-Governance	0.121	***0.757***	0.637	0.463	0.672
Item 6		0.294	***0.652***	0.557	0.445	0.529
Item 7		0.171	***0.758***	0.645	0.508	0.636
Item 8		0.120	***0.698***	0.536	0.389	0.579
Item 9	Personal Self-Authorship	0.279	0.584	***0.767***	0.706	0.738
Item 10		0.213	0.584	***0.785***	0.645	0.782
Item 11		0.124	0.664	*0.739*	0.575	**0.761**
Item 12		0.229	0.640	***0.801***	0.631	0.785
Item 13	Social Self-Authorship	0.188	0.440	0.561	**0.764**	0.520
Item 14		0.176	0.504	0.664	**0.787**	0.624
Item 15		0.190	0.391	0.605	**0.782**	0.535
Item 16		0.255	0.534	0.719	**0.720**	0.655
Item 17	Volitional Resolve	0.225	0.671	**0.682**	0.444	*0.649*
Item 18		0.263	0.651	**0.816**	0.644	*0.747*
Item 19		0.193	0.535	0.722	0.555	***0.727***
Item 20		0.336	0.539	**0.708**	0.601	*0.683*

Correlations between autonomy items and autonomy subscales, corrected for auto-correlation
Values in italics are those values that are expected to be the highest correlation for that item, given that the item corresponds to that sub-scale.
Values in bold are the values with the highest correlations to a subscale per item

Table 3-9, above, presents the auto-corrected correlations for the loadings of items on the subscales of autonomy for reducing water consumption in Study 2. The Internal consistency of the sub-scales are high: Non-Autonomous (α = 0.84); Self-Governance (α = 0.86); Personal Self-Authorship (α = 0.9); Social Self-Authorship (α = 0.89); Volitional Resolve (α = 0.86).

Contrary to the MGM of Waste recycling, the MGM of reducing water use much closer resembles the expected factor structure. In this case the Non-Autonomous, Self-Governance and Social Self-Authorship subscales load exactly as intended. For Personal Self-Authorship only item 11 (… represents a goal I want to pursue) loads slightly better onto Volitional Resolve, and for Volitional Resolve, items 17, 18 and 20 (… is what I want myself to want to do, … is something I genuinely care about, and … is what I choose to do after considering my preferences, respectively) load better onto Personal Self-Authorship.

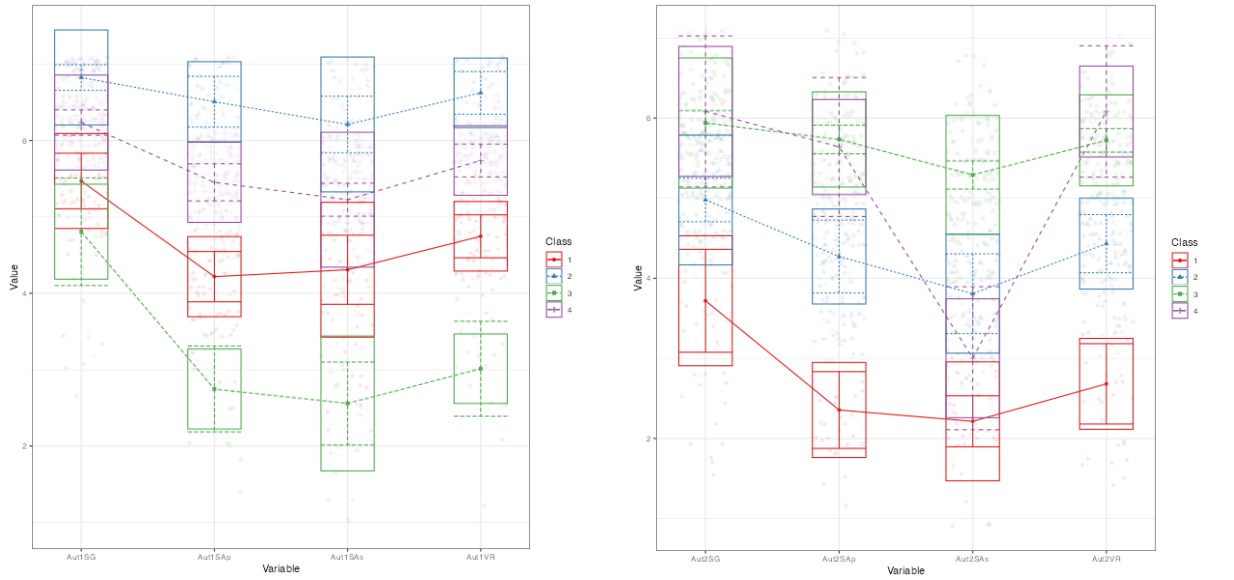
3.3.2.2. Latent Profile Analysis

Once again, for this study we conduct a latent profile analysis (Figure 3-6), to ascertain whether there are different clusters (or profiles) of people that tend to associate more with particular subscales of the autonomous motivation (PhICAM) scale.

For waste separation and recycling (Figure 3-6.a), we observe an almost parallel pattern for the PhICAM subscale responses. There is a clear (albeit not always significantly different) difference between profile 2 (n=32) with the highest PhICAM scores, followed by profile 4 (n=134), profile 1 (n=63), and finally with profile 3 (n=16) which has the lowest scores for each subscale. There is no noticeable difference in kind of association with PhICAM scales, only in degree.

In contrast, we find that for water reduction (Figure 3-6.b), the new behaviour that was not tested in the previous study, we observe a similar pattern to Study 1, with a single profile deviating from the rest. Profiles 1 (n=15), 2 (n=24), and 3 (n=53) again correspond to a generally low, medium and high autonomous motivation. Profile 4 (n=80), follows a different pattern, being roughly equivalent to profile 3's high autonomous motivation for Self-Governance (M=6.00), Personal Self-Authorship (M=5.66) and Volitional Resolve (M=6.16), but is significantly lower for Social Self-Authorship (M=2.84).

Additionally, for both behaviours, but particularly in the case of waste separation and recycling, we see that Self-Governance is the highest subscale for every profile, and clustered closest together. This may indicate that, particularly for recycling, this represents a behaviour that participants universally expect of themselves.



a) Waste Recycling b) Water Reduction

Figure 3-6: Latent Profile Analysis Study 2

Table 3-10: Latent Profile Analysis Study 2, Profile Means and SDs

Profile	N	SG (SD)	SAp (SD)	SAs (SD)	VR (SD)
1	63	5.44 (0.798)	4.19 (0.535)	4.29 (0.911)	4.71 (0.430)
2	32	6.89 (0.245)	6.58 (0.383)	6.26 (0.633)	6.68 (0.366)
3	16	4.84 (1.13)	2.72 (0.724)	2.58 (0.907)	3.02 (0.727)
4	134	6.23 (0.492)	5.45 (0.481)	5.22 (0.932)	5.74 (0.422)

a) Waste Recycling

Profile	N	SG (SD)	SAp (SD)	SAs (SD)	VR (SD)
1	15	3.73 (1.31)	2.33 (0.593)	2.19 (0.616)	2.69 (0.747)
2	24	4.98 (0.780)	4.27 (0.584)	3.80 (0.779)	4.42 (0.576)
3	53	5.94 (0.666)	5.74 (0.576)	5.30 (0.701)	5.73 (0.482)
4	80	6.00 (0.896)	5.66 (0.582)	2.84 (0.611)	6.16 (0.481)

b) Water Reduction

3.3.2.3. Regressions

The factor analysis above is a good indication of how well the underlying concepts of autonomy correlate with each other. Equally interesting, however, is how well such a scale can actually explain variation in or predict pro-environmental behaviour. First, we tested the minimal model, including only the sub-scales of the PhICAM measure to predict Intentions for the respective behaviour and the PhICAM sub-scales and intentions to predict Actual behaviour, each conducted separately for Waste Recycling and Water Consumption.

Table 3-11: Regression results for full models Study 2

	(1) Waste Intentions	(2) Waste Behaviour	(3) Waste Behaviour	(4) Water Intentions	(5) Water Behaviour	(6) Water Behaviour
Intercept	1.81***	00.30	0.09	0.94*	-0.72*	-0.99**
Intentions		0.67***	0.51***		0.51***	0.48***
Common			0.13*			0.11*
Easy			0.30***			0.04
Non-Autonomous	-0.01	--0.02	-0.01	0.07	0.13*	0.10^
Self-Governance	0.15	-0.30*	-0.44***	-0.11	0.02	0.00
Personal Self-Authorship	0.33**	0.17	0.17	0.25^	0.15	0.15
Social Self-Authorship	0.24**	0.18*	0.15^	0.13	0.18**	0.16*
Volitional Resolve	0.04	0.24^	0.19	0.48***	0.05	0.06
df	5, 239239	6, 238238	8, 236	5, 239239	6, 238238	8, 236
F-Statistic	2323.93***	4040.78***	40.30***	3131.7***	6969.51***	54.44***
R-Squared	0.333333	0.5151	0.57	0.4040	0.646464	0.65

*** p < .001, ** p < .01, * p < 0.05, ^ p < 0.1

The regression analysis above (Table 3-11) shows that for recycling waste (model 1; ($F(5,239)=23.93$, $p<.001$, $R^2=.33$) intentions are predicted by Personal Self-Authorship ($b=.33$, $p=.003$) and Social Self-Authorship ($b=.24$, $p=.002$). Actual waste recycling behaviour ($F(6,238)=40.78$, $p<.001$, $R^2=.51$) is predicted by Intentions to recycle ($b=0.67$, $p<.001$), as well as Self-Governance ($b=-.30$, $p=.013$) and Social Self-Authorship ($b=.18$, $p=.030$), as shown in model 2. Model 3 includes the same regression as model 2, but includes the measures of how

easy and common the behaviour is perceived to be (R^2=.57, F(8,236)=40.30, p<.001). In this case, intentions (*b*=.51, *p*<.001), commonness of the behaviours (*b*=.13, *p*=.02), ease (*b*=.30, *p*<.001), and Self-Governance (*b*=-.44, *p*<.001) are all significant.

Model 4 shows that for the intentions to reduce water use (F(5,239)=31.70, p<.001, R^2=.40) only Volitional Resolve is a significant predictor (*b*=0.48, *p*=.001). Model 5 shows that with respect to the actual behaviour associated with reducing water use (F(6,238)=69.51, p<.001, R^2=.64), intentions (*b*=0.51, *p*<.001), Social Self-Authorship (*b*=0.18, *p*=.005) and non-autonomous (financial) motivation significantly predicts reducing water consumption (*b*=0.13, *p*=.01). Finally, model 6, adding commonness of behaviour and the ease associated with reducing water use is significant (F(8,236)=54.44, p<.001, R^2=.65). Intentions (*b*=0.48, *p*<.001), commonness (*b*=0.11, *p*=.02) and Social Self-Authorship (*b*=0.16, *p*=.01) are the only significant predictors (non-autonomous is no longer significant when common is included).

Table 3-12, below, shows the full regression models predicting average intentions, average actual behaviour, and the three self-determined subscales of the Motivation Toward the Environment Scale for Study 2. Model 1, predicting intentions with average PhICAM responses to both behaviours, MTES, Values, social comparison, IAF and demographics (F(19,225)=7.75, p<.001, R^2=.40), demonstrates that IAF (*b*=0.22, *p*=.030) is the only significant predictor. Model 2 predicts average actual behaviour with average intentions, average PhICAM, MTES, values, IAF, Social Comparison and demographics, and explains a lot of variance (F(20,224)=15.07, p<.001, R^2=.57), but only intentions (*b*=0.59, *p*<.001), is a significant predictor.

Finally, we analyse the full models predicting the three self-determined motivation subscales of the MTES (Intrinsic, Integrated and Identified motivation) with the PhICAM Scale, Values, Social Comparison Scale, the Index of Autonomous Functioning, and Demographics. The key results for these final models (Model 3 – Model 6) are that the significant predictors of Intrinsic Motivation (F(13,231)=14.46, *p*<.001, R^2=.45) are the non-autonomous subscale of PhICAM (*b*=0.23, *p*=.005), Biospheric values (*b*=0.27, *p*<.001), Altruistic values (*b*=-0.23, *p*<.001), IAF (*b*=0.41, *p*<.001) and gender (*b*=0.50, *p*<.001). Integrated motivation (F(13,231)=38.41, p<.001, R^2=.68), is predicted by all subscales of PhICAM except Volitional Resolve (Non-Autonomous: *b*=0.17, *p*=.005; Self-Governance: *b*=-0.28, *p*<.001; Personal Self-Authorship: *b*=0.57, *p*<.001; Social Self-Authorship: *b*=0.12, *p*=.049). Additionally, Biospheric (*b*=0.38, *p*<.001), egoistic (*b*=-0.11, *p*=.010) and altruistic (*b*=-0.21, *p*<.001) values all predict integrated motivation, together with IAF (*b*=0.32, *p*<.001) and age (*b*=0.07, *p*=.001). Identified motivation

(F(13,231)=23.55, p<.001, R^2=.57), is predicted by Self-Governance (b=0.27, p<.001), Volitional Resolve (b=0.38, p<.001), biospheric values (b=0.16, p<.001), egoistic values (b=-0.10, p=.009), and IAF (b=0.20, p=.011). Finally, the composite measure of Intrinsic motivation found elsewhere in the literature was predicted using the same variables (F(13,231)=35.94, p<.001, R^2=.67), and here, too, Self-Governance (b=0.38, p<.001), Volitional Resolve (b=0.38, p<.001) and biospheric values (b=0.38, p<.001) were the significant predictors.

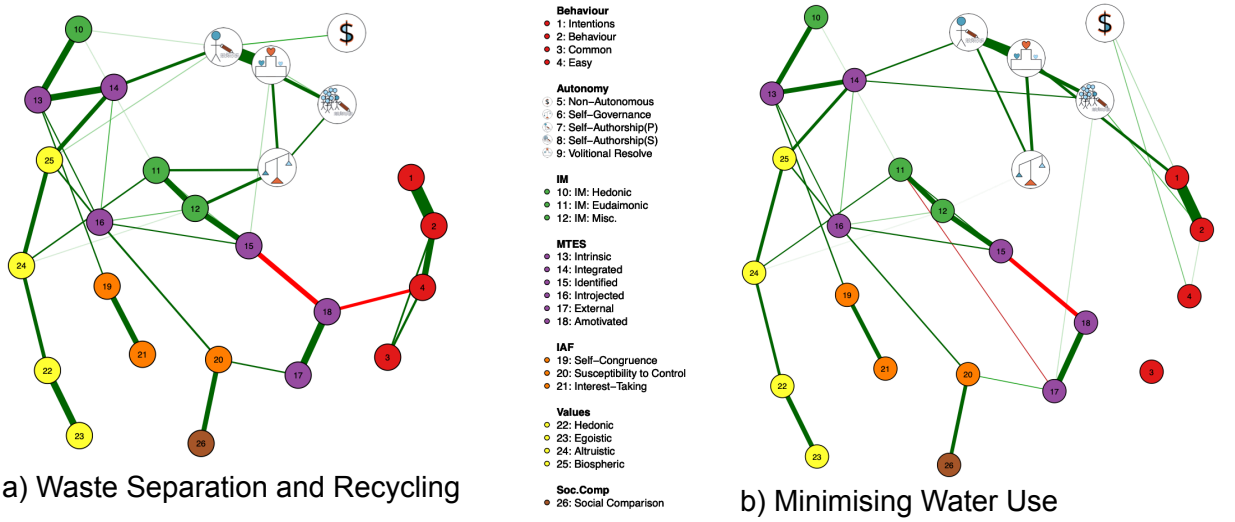
Table 3-12: Regression results for full models, Study 2

Predictor	(1) Intentions	(2) Actual Behaviour	(3) MTES: Intrinsic Motivation	(4) MTES: Integrated Motivation	(5) MTES: Identified Motivation	(6) Alt. Intrinsic Motivation
Intercept	1.85*	0.78	-1.65	-1.92*	0.80	0.97^
Intentions		0.59***				
Non-Autonomous	0.09	-0.02	0.22**	0.17**	-0.05	-0.00
Self-Governance	0.03	-0.11	-0.15	-0.28***	0.27***	0.27***
Personal Self-Authorship	0.03	0.11	0.15	0.57***	-0.02	0.03
Social Self-Authorship	0.08	0.04	0.14^	0.12*	-0.07	-0.07
Volitional Resolve	0.23^	-0.00	0.18	0.01	0.38***	0.26***
MTES Intrinsic	-0.03	0.06				
MTES Integrated	0.03	0.05				
MTES Identified	0.01	0.08				
MTES Introjected	0.04	-0.07				
MTES External	-0.10^	-0.06				
MTES Amotivation	-0.10	-0.02				
Values Bio.	0.08	0.01	0.27***	0.38***	0.16***	0.14***
Values Hed.	-0.02	-0.01	0.11	0.03	0.05	0.05
Values Ego.	-0.03	0.05	0.01	-0.11*	-0.10**	-0.05
Values Alt.	-0.06	-0.00	-0.23***	-0.21***	0.01	0.07^
Soc. Comp.	-0.05	-0.06	0.08	0.08	-0.01	0.09^
IAF	0.22*	0.01	0.41***	0.32***	0.20*	0.06
Gender	0.14	0.14	0.50***	0.13	0.07	0.03
Age	0.02	0.01	0.00	0.07**	0.01	0.01
df	19, 225	20, 224	13, 231	13, 231	13, 231	13, 231
F-Statistic	7.75***	15.07***	14.46***	38.41***	23.55***	35.94***
R-Squared	0.40	0.57	0.45	0.68	0.57	0.67

*** p < .001, ** p < .01, * p < 0.05, ^ p < 0.1

3.3.2.4. Gaussian Graphical Modelling

In this study, when considering the Gaussian Graphical Models (Figure 3-7), and using the same parameters as in Study 1, we observe a similar pattern as in Study 1, but this time with the extra variables of Intrinsic Motivation included somewhere in between the PhICAM subscales and the MTES subscales, and the Easy and Common variables most closely related (both in terms of proximity and partial correlations) to actual behaviour for Waste Recycling, and with a partial correlation between easy and the non-autonomous PhICAM subscale.



a) Waste Separation and Recycling

b) Minimising Water Use

Figure 3-7: Gaussian Graphical Models of Study 2

In the case of waste separation and recycling, the only significant partial correlation between any of the variables *easy, common, intention or behaviour*, and the rest of the variables is a negative partial correlation between amotivation and Easy. The PhICAM subscales mostly form partial correlations with one another, but Personal Self-Authorship also positively partially correlates with Hedonic Intrinsic Motivation, Integrated Motivation (MTES), and Biospheric Values. Volitional Resolve positively and significantly partially correlates with Identified Motivation (MTES). Self-Governance positively and significantly partially correlates with Eudemonic Intrinsic Motivation (Zeiske, 2021) and with Miscellaneous Intrinsic Motivation measures (Sharpe, 2022).

Conversely, in the case of minimising water use, besides having a strong partial correlation to actual behaviour, intentions are partially correlated with Volitional Resolve. Actual behaviour, besides being predicted by Intentions, is also predicted by Social Self-Authorship, the

Non-Autonomous subscale of the PhICAM scale, and how easy the behaviour is said to be. Social Self-Authorship is also partially correlated to External Motivation (MTES), and Integrated Motivation (MTES). The last remaining partial correlation between one of the PhICAM subscales and any other variables beyond the PhICAM scale is between Personal Self-Authorship and Integrated Motivation (MTES).

3.3.3. Discussion

Study 2 aimed to replicate, for the most part, the results found in Study 1. Particularly important for the sake of developing the Philosophically Informed Conceptualisation of Autonomous Motivation (PhICAM) Scale, is improving the operationalisation of the foundational concepts of the subscales of autonomy and realising this improvement in the factor analysis (multiple group method). Although conceptually the scale has improved, this is not necessarily reflected in the factor analysis, where particularly Personal Self-Authorship and Volitional Resolve seem to empirically covary and correlate strongly. Again, this leads us to conclude that indeed the subscales of self-authorship (personal and social), though conceptually distinct, are empirically similar. By itself, this does not necessarily pose a problem for the scale or for our conceptualisation of autonomy. Self-Governance and Social Self-Authorship, by contrast, have relatively successful and consistent factor structures.

Once again, there seems to be a difference in the performance of the MGM analysis for the different surveyed behaviours. Waste disposal and recycling has eight items that do not correlate as expected, where minimising water use only has four. It may simply be that the scale works better for more complex or difficult behaviours, particularly behaviours that require explicit and deliberate choice (for many people recycling paper and glass is a default and a part of their routine). This seems to be in line with the descriptive results in Study 2 in particular. The items of the scale will be revisited with these insights to determine whether and how they may be amended and improved further, particularly for easier and more common behaviours, and for the items of Volitional Resolve.

Regression analysis revealed that different subscales of autonomy predict intentions and actual behaviour, and that these relationships are again different for waste recycling and minimising

water use. Personal and Social Self-Authorship both predict intentions to recycle, whereas Volitional Resolve predicts intentions to minimise water use.

On the other hand, actual waste recycling behaviour is predicted by intentions, Self-Governance (although the coefficient is negative, contrary to expectations) and Social Self-Authorship (over and above the contribution this makes to predicting intentions. The directionality of Self-Governance is puzzling, and suggests that people are more likely to perform a behaviour the less they perceive this as the right thing or morally justified thing to do. This may be due to the desire to feel like pro-environmental behaviours are a choice rather than an imposition (even if this imposition comes from within the self).

The contribution of Social Self-Authorship seems to explain the same variance that the variables common and easy explain when they are included. This suggests that whereas people feel like their environment makes them want to behave this way autonomously, this desire does not seem to be empirically over and above the contribution that the social norm makes directly. Regarding minimising water consumption, intentions and Social Self-Authorship remain significant predictors, even after including the dimensions *common* and *easy*, indicating that in this case, people may be motivated internally to behave sustainably even when considering the initial (descriptive) social norm that may have influenced them. It seems that Social Self-Authorship influences one's intentions for easy and common behaviours, but once this variance is controlled for, Social Self-Authorship no longer predicts actual behaviour. This does not seem to be the case for the more difficult and less common behaviour, where Social Self-Authorship remains a significant predictor after controlling for these effects, in line with attribution theory's discounting principle (Kelley & Michela, 1980). From these analyses of the simple regression models, it seems that Social Self-Authorship plays a particularly interesting role.

To answer the hypothesis regarding the predictive power of the PhICAM scale relative to the MTES, full model regressions showed that indeed, in line with our theorising, it seems that PhICA, which we argue is closer to what actual autonomy represents, does not predict intrinsic motivation (the subscale of MTES), but does predict integrated and identified motivation, which we believe to be better approximations of what intrinsic motivation should actually represent. Similarly, the composite measure of intrinsic motivation we prefer to use was again predicted by Self-Governance and Volitional Resolve, in models where the regression coefficients look much more like those in the models predicting the integrated and identified subscales of MTES than

intrinsic subscale. Along those same lines, the index of autonomous functioning did not significantly predict the intrinsic motivation composite measure, indicating that, at least regarding the operationalisation we believe describes intrinsic motivation best, our scale of autonomy is a better predictor of intrinsic motivation.

Finally, the Gaussian Graphical Modelling visually demonstrated the difference between the two sampled behaviours. It is clear that there is some difference between recycling waste and minimising water use, at least within our sample. The fact that there are no significant partial correlations between the PhICAM scale and the waste recycling outcome variables (intentions or actual behaviour) suggests that there may not be a strong consideration of motivation when engaging (or not) in recycling behaviours. By contrast, for minimising water use, Volitional Resolve has a strong partial correlation with intentions, and Personal Self-Authorship has a smaller but significant partial correlation with actual behaviour. This demonstrates the difference in how behaviours are perceived and considered.

Another point that may be relevant in this discussion is that in this study, the participants were sampled from a psychology student sample at the University of Groningen, in the Netherlands. We posit that Dutch students, and in our case psychology students, are also generally more liberally oriented than non-students, but perhaps not as financially well-off as their non-student liberal counterparts (Brianne Hastie, 2007; Pascarella & Terenzini, 1991). This would explain the ceiling effects observed for the sustainable behavioural intentions for recycling, but lower scores for buying sustainable products, which is often more expensive (Van der Werff et al., 2013). We maintain that for the purposes of developing a scale, student samples are particularly useful and sufficiently valid.

Study 2 showed that, for the most part, we can empirically distinguish the different subscales of autonomy developed from the philosophical literature. Additionally, these subscales of autonomy all seem to play a unique role in predicting different forms of intrinsic motivation, self-determined motivation, intentions and behaviour regarding specific individual behaviours and pro-environmental behaviours in general. Our prediction that how easy and common a behaviour is determines which form of autonomy plays a more important role seems to be largely confirmed.

3.4. Study 3

For Study 3 of the development of the PhICAM scale, we test our scale in an experiment conducted by Philipp Schneider, another SCOOP consortium PhD researcher working on the sister project of this project, 11.6 Mobilizing Households for a Sustainable Energy Transition. The purpose of this collaboration is to demonstrate the validity and reliability of the PhICAM scale after having been translated to Dutch. Concurrently, Schneider and colleagues were able to use the scale to measure autonomous motivation for sustainable behaviour as a general measure. First, we present some information about the study itself, and its aims, before describing the hypotheses we investigate for our own purposes.

The original study, conducted by Schneider and colleagues (2023), investigates how diffusion of behaviour, attitudes and beliefs propagate through a network. Specifically, the study sets out to demonstrate how behaviours, beliefs and attitudes tend to converge and become uniform throughout a network for continuous behaviours (e.g., wastefulness with plastic), whereas for binary behaviours (e.g., whether or not to purchase green energy) the network can be stable with multiple states as local majorities. The study presents a model representing this argument and tests it. The model demonstrates how participants choose make investments after receiving information that may be true or false depending on the assigned condition.

As this study is conducted in Dutch, this study presented an opportunity to test a translated version of the PhICAM scale with a different sample. Our main hypothesis is that all the items of the scale have the highest correlation with their own sub-scale, even after correcting for auto correlation, compared to the other PhICAM subscales. Additionally, we predict that a latent profile analysis will demonstrate that participants will cluster into profiles that differ only in degree, not in kind, of dominant autonomous motivation orientations.

3.4.1. Methods

3.4.1.1. Participants

In order to test the scale in another (experimental) setting, we added the PhICAM scale in the Experimental Laboratory for Sociology and Economics (ELSE) at Utrecht University. Ethics approval was requested and received by Schneider et al., (2023) at the University of Utrecht. Participants (n=222) were assigned to groups of 6 participants each. Each group played 8 “investment games”. 114 participants started playing the investment games in each of the 4 different networks making their investment decisions continuously followed by playing another 4 investment games in each of the 4 networks making decisions binarily. 108 participants started their first 4 games making decisions binarily and then played another 4 games where they could make investments on a continuous scale. The experiment took about 45 minutes and then the participants had 15 minutes for the questions. It was during these last 15 minutes that participants were asked to fill in the survey including the PhICAM scale.

3.4.1.2. Materials

The main variable of interest the philosophically informed conceptualization of autonomous motivation (PhICAM) scale in a different setting. By testing the scale in a different setting, with participants from a different university and department’s student participant pool, we can test if the scale is reliable across studies and contexts. The data also includes the original variables as used by Schneider and colleagues (2023), including a dependent variable (Invest) and two independent variables (Treatments and Network).

3.4.1.3. Data Analysis

Just as in the previous two studies, we will use the multiple group method which is computed using R, and the latent profile analysis (Rosenberg et al., 2019) using the snowRMM package (Seol, 2022) in Jamovi (The Jamovi Project, 2021).

3.4.2. Results

3.4.2.1. Multiple Group Method

Table 3-13: Multiple Group Method Study 3.

Item	Mean	s.d.	Autonomy Subscale Clusters			
			Self-Governance	Self-Authorship		Volitional Resolve
				Personal	Social	
Self-Governance (α = 0.90)	5.358	1.227				
Item 1	5.534	1.382	***0.920***	0.636	0.475	0.698
Item 2	5.475	1.400	***0.887***	0.601	0.469	0.698
Item 3	4.949	1.484	***0.869***	0.664	0.550	0.697
Item 4	5.475	1.306	***0.844***	0.649	0.539	0.682
Personal Self-Authorship (α = 0.90)	4.519	1.380				
Item 5	3.890	1.688	0.500	***0.875***	0.532	0.691
Item 6	4.915	1.465	0.749	***0.872***	0.568	0.841
Item 7	4.754	1.574	0.661	***0.848***	0.496	0.778
Item 8	4.517	1.562	0.650	***0.915***	0.557	0.780
Social Self-Authorship (α = 0.87)	3.930	1.186				
Item 9	3.915	1.291	0.410	0.407	***0.808***	0.379
Item 10	4.017	1.444	0.540	0.568	***0.895***	0.560
Item 11	3.619	1.507	0.443	0.549	***0.861***	0.501
Item 12	4.169	1.335	0.570	0.548	***0.829***	0.586
Volitional Resolve (α = 0.89)	4.883	1.367				
Item 13	5.280	1.473	0.741	0.743	0.557	***0.859***
Item 14	4.686	1.594	0.577	0.803	0.493	***0.852***
Item 15	4.839	1.659	0.752	0.744	0.515	***0.899***
Item 16	4.729	1.540	0.709	0.769	0.526	***0.877***

Note: Correlations between autonomy items and autonomy subscales, corrected for auto-correlation
Values in italics are those values that are expected to be the highest correlation for that item, given that the item corresponds to that sub-scale.
Values in bold are the values with the highest correlations to a subscale per item

As Table 3-13, above, demonstrates, the PhICAM scale demonstrates very good internal consistency and reliability. Each of the subscales is individually internally reliable, with sufficiently high alphas, starting with the lowest for Social Self-Authorship at α = 0.87, Volitional Resolve at α = 0.89 and both Self-Governance and Personal Self-Authorship with alphas of α = 0.90.

Each of the items correctly loads most strongly onto the subscale for which it is designed, which is a first for the scale in our studies so far. Each item loads onto the remainder of the subscale for which it is designed (as it is adjusted for autocorrelation) with a minimum of r=.808. Item 1 has the highest MGM subscale correlation coefficient with r=.920. Although it still loads most strongly onto Volitional Resolve (r=.852), item 14 also correlates highly with Personal Self-Authorship (r=.803).

3.4.2.2. Latent Profile Analysis

For the purposes of understanding the dominant autonomous motivation orientations of the participants, we conduct a latent profile analysis (Figure 3-8). This allows for an analysis of whether people only differ in terms of their autonomous motivation in their extent, or also in kind. That is to say, some people may be autonomously motivated through moral considerations (i.e., Self-Governance), whereas others may be motivated by hierarchical desires (i.e., Volitional Resolve).

In line with Studies 1 and 2 of this chapter, the most obvious difference between the emergent profiles is that there is a difference in average degree of autonomous motivation (see Figure 3-8 and Table 3-14, below). This is to say that profile 2 (n=40) has the lowest average autonomous motivation, followed by profile 3 (n=120), and profile 1 (n=208). Finally, profile 4 (n=64) showed the highest level of autonomous motivation on the subscales of Personal Self-Authorship (M=6.47), Social Self-Authorship (M=6.53) and Volitional Resolve (M=6.59), but was significantly lower for Self-Governance (M=4.38). Apart from this seeming anomaly, the average trend among the first three profiles is that participants tend to report the highest scores on Personal Self-Authorship, followed closely by Volitional Resolve and Self-Governance. The lowest scores for profiles 1, 2 and 3 were all for Social Self-Authorship. Only Profile 4 with the very low results for Self-Governance is the outlier to this trend.

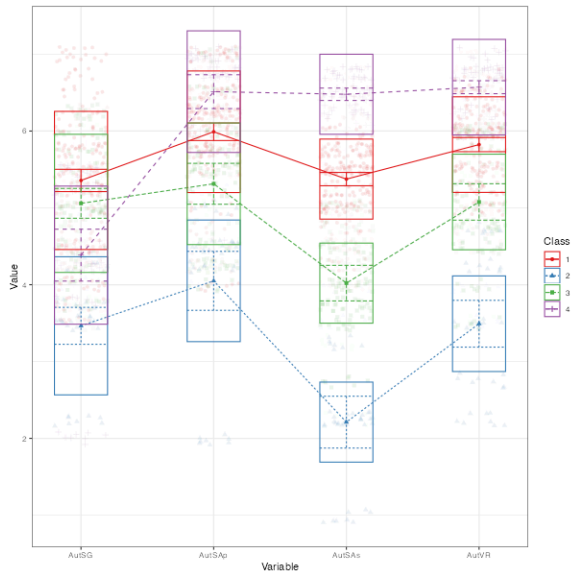


Figure 3-8: Latent Profile Analysis Study 3

Table 3-14: Latent Profile Analysis Study 3, General Sustainable behaviours

Levels	N	SG (SD)	SAp (SD)	SAs (SD)	VR (SD)
1	208	5.38 (0.943)	6.06 (0.627)	5.37 (0.430)	5.87 (0.473)
2	40	3.45 (0.668)	4.05 (1.07)	2.20 (0.723)	3.50 (0.934)
3	120	5.08 (0.748)	5.25 (0.870)	4.07 (0.597)	5.02 (0.725)
4	64	4.38 (1.09)	6.47 (0.811)	6.53 (0.197)	6.59 (0.307)

3.4.3. Discussion

In this study, we test the PhICAM scale for the third time. The main change to the scale is that we removed the Non-Autonomous subscale. Furthermore, we tested the scale in Dutch for the first time, after translating the scale following two rounds of back-translation and conferring with academic specialists.

The results indicate that the PhICAM scale works better than previous studies when it comes to internal consistency and reliability. The Multiple Group Method demonstrates that each of the items loads onto the intended subscale with a higher autocorrected correlation than it correlates with any other subscale. This is an interesting finding, given that not much had changed to the items of the subscales that remained, but perhaps participants were more inclined to vary their answers more for the relevant autonomous motivation subscales now that the non-autonomous subscale was removed (as if the removal of a “decoy” removed a relative ceiling effect).

The Latent Profile Analysis demonstrates mostly similar results to previous studies, showing that for the most part, profiles emerge that are different in degree, but not in kind. People are generally more or less autonomously motivated to engage in sustainable behaviours, but do not generally differ regarding the source of their autonomous motivation. That is, except for one emergent profile. Just as was the case in Study 1 and Study 2 (in the case of water use minimisation), there was a single profile that did not follow the same trend of being roughly equal across subscales, and roughly parallel between other profiles in terms of autonomous motivation. The difference this time was that rather that Social Self-Authorship being the odd one out with a very low score for one of the profiles, in this study, the lowest score was found for Self-Governance.

Some differences to mention between this study and previous studies is that this time, we asked participants to report to what extent they agreed with the statements of the PhICAM scale for sustainable behaviours in general, whereas in previous iterations of the scale, specific sustainable behaviours were targeted. This may have prompted participants to think more generally about going out of their way to be sustainable, which can seem intimidating. In previous studies, participants may have considered smaller, more manageable behaviours like separating waste and recycling which is less daunting. For such general lifestyle changing behaviours, it could be argued that people may feel less like it should be considered a moral matter (in line with Self-Governance), even if it is self-imposed, as it can make participants feel

like their choice to be less than sustainable is unacceptable. Even though the moral judgment is self-imposed, if people do not act in accordance with these judgments, this can still lead to negative self-reflecting consequences (i.e., cognitive dissonance; Bem, 1967; Festinger, 1962).

The predominant change between this study and the last study is that in this study, participants were sampled from the sociology and economics faculty at the University of Utrecht. This is contrasted to Study 2, where participants were sampled from a psychology student participant pool from the University of Groningen. We posit that it is possible that psychology students have more left-wing views than economics students, and these differences may play a role in suggesting moralisation of sustainable behaviour (Guimond & Palmer, 1990). The less moralised the behaviour is (experienced), the lower people may report being influenced by Self-Governance. Similarly, the more moralised a behaviour is, the more Self-Governance may play a role, rather than Social Self-Authorship, for example, even though most moral judgments we hold as a society are socially construed and permeated (Ellemers et al., 2019).

The main limitation of this study is that because it was carried out by a fellow researcher, we had less control over the rest of the study and the measured variables. It was interesting to see how the scale could be applied in a different setting and in a different language, but for this some sacrifices had to be made. Overall, the study demonstrates that the scale works well in capturing different facets of autonomous motivation. Nonetheless, the subscales are likely still very closely related, at least experientially.

3.5. General Discussion

This chapter aimed to study the relationship between autonomy, intrinsic motivation and pro-environmental behaviour. Our focus was predominantly to develop, test and validate a scale of Philosophically Informed Conceptualisation of Autonomous Motivation (PhICAM) developed from the philosophical literature. The subscales of this new measure are based on Kantian moral autonomy (what we call Self-Governance), Razian self-authorship (which we combine further with self-categorisation theory to develop Personal Self-Authorship and Social Self-Authorship) and Frankfurtian hierarchy of desires (what we call Volitional Resolve). This conceptualisation of autonomous motivation is a novel approach aimed to shed light on the narrow scope of existing autonomy and intrinsic motivation measures. We predominantly aimed to test the PhICAM scale in order to determine if the four selected subscales of autonomy we developed actually measure empirically distinguishable concepts. Second, we want to know if these facets can significantly predict intentions and actual (self-reported) behaviour.

Our studies largely support the distinction between Self-Governance, Personal Self-Authorship, Social Self-Authorship and Volitional Resolve as separate facets, definitions and understandings of autonomous motivation. After some tweaking of the initial scale's items, the factor structure improved significantly over the three iterations, to become clearly distinct subscales of autonomous motivation for each subscale. This suggests that the distinction may be theoretically important and practically relevant. Furthermore, these insights may be interesting to a broader audience interested in autonomy or motivation as such, indicating that the conceptual disagreements in philosophy may be investigated empirically by allowing for each 'type' of autonomy as derived from the philosophical literature to be a meaningful predictor of behaviour.

Our second hypothesis, concerning the predictive power of the scale and specifically its subscales, was confirmed as well. In the first two studies we found that different subscales of autonomous motivation were predictive for different behaviours: less so for waste recycling in Studies 1 and 2, but more so for buying sustainable products and minimising water use, Study 1 and 2, respectively. Being able to significantly predict intentions and behaviour with different conceptualisations of autonomy over and above the existing Index of Autonomous Functioning (Weinstein et al., 2012) or the Motivation Towards the Environment Scale (Pelletier, Nortel, et al., 1998) indicates the need for a revised scale, which we offer. In particular, in Study 2, a distinction was made between easy and difficult, or common and less common behaviours. Not

only is more variance explained in the models predicting the more difficult behaviours, the types of autonomy that explain the most variance also changes accordingly. As such, for waste disposal and recycling, Self-Governance (Study 1), Personal Self-Authorship (Study 2) and Social Self-Authorship (Study 1 and 2) are important predictors of intentions, whereas for buying sustainable products or reducing water use (the more difficult behaviours sampled), Volitional Resolve is consistently more important. This suggests that for more difficult behaviours, participants are likely to make an evaluative judgment, considering alternatives to the behaviour. Additionally, the scale was also translated for Study 3, in which we found that the factor structure of the scale is perfectly consistent, in a new language and with a new demographic sample.

Whether the predictive power of autonomous motivation subscales (based on different conceptions of autonomy) is truly due to the difference in how easy and common these chosen behaviours are, or something else entirely is something that will be addressed in future research. We believe that the scale has been sufficiently developed and tested in three different settings. We have tested different specific sustainable behaviours and sustainability motivation in general, with two student samples (psychology students in Groningen, and economics/ sociology students in Utrecht), and an online sample (using mTurk in the United States), in both English and in Dutch. The next step is to conduct experimental studies to see if an experimental and controlled manipulation of a group norm can be observed to lead to a change in autonomous motivation to engage in sustainable behaviours.

4. Experimental Studies with Manipulation and Mediation

Abstract

When people can be motivated autonomously, rather than due to external factors, this comes with a host of benefits, including that people engage in behaviours without a need for surveillance or incentivisation. In this chapter we use different interventions to attempt to make people more autonomously motivated to be sustainable through their own morality, desires or goals. Using a scale developed in the previous chapter, we are able to shed light on how a group norm may lead to increased sustainable behaviour by understanding the process of internalisation as autonomous motivation.

We conducted three experimental studies in which we manipulated the group norms presented to participants. Study 1 (n=118) manipulated whether participants saw an in-group or out-group for petitions to reduce meat consumption or improve electronic waste recycling. We find some evidence for full (serial) mediation of the relationship between group importance of behaviour and intentions for behaviour. Study 2 (n=213) manipulated how the introduction of a meat tax was framed: for collective environmental, individual health, or governmental financial reasons. Volitional Resolve, again is the best predictor of the outcome variable and mediates the relationship between the manipulation check and intention to reduce meat consumption. Study 3 (n=1014) presented a nationally representative sample with an in- or out-group norm for lab grown meat, nuclear power and farmers' protests. Study 3 features a significant in-group norm manipulation that was experienced as autonomously motivating. In the case of lab grown meat and farmers' protests, a manipulation of group norms led to a change in policy support, mediated through the PhICAM scale we have developed. Implications for disentangling the oxymoron of manipulating a group norm to stimulate autonomous motivation are discussed.

4.1. Introduction

4.1.1. Pro-environmental Behaviour and Intrinsic motivation.

Human behaviour is a major contributor to, and a source of overcoming environmental problems (IPCC, 2021). Given that the current policy climate leaves a lot of decisions to individuals, it is important that people are sufficiently motivated to make sustainable choices. Intrinsic motivation has been shown to be an important predictor of pro-environmental behaviour (Steg, 2016). Intrinsic motivation requires and implies that people make decisions autonomously (cf. self-determination theory; e.g., Ryan & Deci, 2000b). For motivation to be intrinsic means that people are not steered by external pressures, but rather behave in a certain way because they choose to do so themselves (Deci & Ryan, 1985). Intrinsic motivation thus comes from within, and requires that a behaviour or motivation comes from an internal locus of control; this is what it means for decisions to be made autonomously (Deci & Ryan, 1985).

4.1.2. Autonomy vs. individuality (SDT).

Autonomy implies that convictions and resulting behaviour are experienced as internal—emanating from within the self rather than external to the self—and that these convictions must be perceived as genuinely endorsed by the individual (Dworkin, 2015). While the understanding of autonomy posited by the self-determination literature may be sufficient in some cases, there are many different understandings of autonomy, with important nuances (Chapter 2). Some theories focus on reasons and rationality, while others focus on desires and sentiments; some are more individualistic in form whereas others are more socially constructed (see Chapter 2 of Christman & Anderson, 2005). The degree of actual autonomy that people have is, of course, very important, as many (behavioural) freedoms and qualities of life may be limited under, for example, a totalitarian regime, subsuming autonomy (Heying et al., 2016). However, as long as some basic or moderate level of actual autonomy is realised, perceived autonomy may be more influential than some objective measure of autonomy when it comes to a behaviour being experienced as motivated autonomously or intrinsically. Thus, we believe perceived autonomy with regard to a particular behaviour, which is what we will call autonomous motivation, is crucial for a behaviour to be sustained without any need for surveillance, enforcement or incentivisation.

As intrinsic motivation emanates from within an individual and classically supposes an individual is free from external pressures, it is often assumed that autonomy cannot be derived from or in conjunction with group influence (cf. self-determination theory; Ryan & Deci, 1985). However, we posit that social influence may also be intrinsically motivating, or may foster intrinsic motivation. Based on social identity theory we suggest that a conviction may be experienced as autonomous, even when this emerges from the group, as long as the individual strongly identifies with that group because the group can be defined as a level of self (J. C. Turner et al., 1979).

Self-categorization theory (Turner, 1991) states that while individuals may be an important part of the groups to which they belong, these same groups also contribute to who the individual is: the group within the individual is an integral part of the self (Spears, 2021). In fact, the unique combination of groups that we are a part of is what constitutes our identity—who we are. The more we identify with a group, the more a group is considered to be a fundamental part of the self: the group within the individual. This means that if people identify strongly with a group, the influence from the group may be experienced as autonomous (coming from within the self) and thus intrinsically motivating (Spears, 2021).

4.1.3. Philosophically Informed Conceptualisation of Autonomous Motivation (PhICAM).

In order to investigate whether social influence may indeed be experienced as intrinsically motivating, we must delineate the intricacies and subtleties of different philosophical understandings of autonomy. To do so, we developed a scale of Philosophically Informed Conceptualisation of Autonomous Motivation (PhICAM). This scale is made up of four sub-scales: Self-Governance, Volitional Resolve, Personal Self-Authorship and Social Self-Authorship. These sub-scales differ in terms of where the conviction of autonomy is derived from, either a sense of morality, one's unique desires or one's overarching goals; and in terms of individualism or communitarianism. With this scale, we measure different aspects of autonomous motivation, each based on a different type of philosophical autonomy, and likely with different implications for the role of social influence. Although these sub-scales are based on different understandings of autonomy, there is a lot of overlap between the concepts, as they all pertain to the core concept of autonomy. It is therefore entirely possible that if someone is

autonomously motivated through one facet of the PhICAM scale (Volitional Resolve, say) that they also experience autonomous motivation through another facet (such as Personal Self-Authorship).

Self-Governance is a highly rational and moral interpretation of autonomous motivation, based on Kant's categorical imperative. It states that an individual should want to do those things that they could freely will themselves to do (Kant, 1785); their capacity for reason and rationality should be what dictates the right course of action, particularly regarding universalizability.

Volitional Resolve, on the other hand, is based on desires rather than reasons. This type of autonomous motivation requires that an individual to behave in line with not just what they want to do (their first-order desires), but in line with their "reflective self-evaluations" of these wants (their second-order desires, or what they *want to* want to do) which need not have any grounding in rationality or reason (Frankfurt, 1971, p.7).

Self-authorship concerns behaving in such a way that this is in line with one's comprehensive, or overarching goals (Raz, 1986). We decided to divide this single understanding of autonomous motivation into two sub-scales, given that Raz discusses autonomy as individual and communitarian. As such, we distinguish between Personal Self-Authorship and social (e.g., group-identity based) self-authorship. Personal Self-Authorship concerns behaving in line with what someone considers personally important and stemming from deeply held individual convictions. Contrary to Kant, however, this is not necessarily based on morality or universalizability. Social Self-Authorship, on the other hand, pertains to the experience of autonomy through a process of learning and growing, adopting and adapting behaviours from one's social surroundings. Essentially this conceptualisation of autonomous motivation pertains to the internalisation of group influences and making it or experiencing it as one's own. Personal and Social Self-Authorship are the two most closely related facets of autonomous motivation in terms of their conceptualisation and their operationalisation. It is thus likely that there will be some empirical overlap between the two.

Although each of the sub-scales of the PhICAM scale represent novel conceptualisations of intrinsic motivation, Social Self-Authorship is of particular interest. It brings together the intrinsic motivation literature and the social identity literature, through a philosophical approach to autonomy and communitarianism. As such, exploring Social Self-Authorship may be valuable

for understanding how to address certain societal issues using social processes while maintaining and fostering the perception and experience of autonomy.

The main tenet of Social Self-Authorship is that people are dynamic and social beings, that influence and are influenced by the people around them. Raz explicitly mentions the importance of social pursuits and relations, and social forms of behaviour as they exist within societies. These societies (made up of individuals, groups and an overarching culture) tend to help an individual develop a (few) comprehensive goal(s) that drives much of their behaviour and is intertwined with their intrinsic or autonomous motivation. The influence that others have on an individual may become internalised if they endorse, adopt and adapt these goals as their own (see Chapter 2).

4.1.4. Comprehensive goals and Social Self-Authorship.

According to Raz, for behaviour to be considered autonomous, the behaviour should be in line with and in the perpetual pursuit of a comprehensive goal. “Success in one’s comprehensive goals... depends to a large extent on success in socially defined and determined pursuits and activities.” (Raz, 1986, p.309). Such comprehensive goals should stem from social forms of behaviour, or existing social institutions in the given society in which one lives. This is to say that the overarching goals that we have and act in line with should be based on some plausible goal within the realm of socially constituted possibilities of society. These social forms are somewhat flexible, in that the behaviours may be deviations or variations on a common theme, but this does mean that “one’s cultural membership determines the horizon of one’s opportunities” (Raz, 1986, p. 177). For example, it is not possible to have the comprehensive goal of living sustainably to mitigate climate change if there is no concept of climate change, or no societal institutions that currently bar this or make it relevant for an individual to want to do so. Our goals should be possible or plausible given the context in which we live. Additionally, the goal must have “ramifications which pervade important dimensions of my life” (Raz, 1986, p. 308). Accordingly, the goal of environmental protection, sustainable living or climate change mitigation is only a comprehensive goal if it is consequential for one’s life.

4.1.5. Behaviour types (domains and dimensions) and types of Autonomous Motivation.

We theorize that different types of behaviours are more or less likely to be predicted by different types of autonomous motivation. For example, certain behaviours may be quintessentially moralised, and those would be most likely to be predicted by Self-Governance. A behaviour like murder may be predicted better by Self-Governance than by one of the other facets of PhICAM, given that there tends to be consensus that this pertains to a fundamental matter of right and wrong. A behaviour involving an internal conflict of desires, such as smoking or another addictive behaviour, may be better predicted by Volitional Resolve: whether, upon reflection and evaluation, the person wants to be swayed by a certain desire.

Similarly, there may be behaviours that are predicted particularly well by more individualistic interpretations of autonomous motivation, such that these behaviours are of significant personal importance, and contribute to one's individually held comprehensive goals. Conversely, in line with Social Self-Authorship, it is entirely plausible that someone develops a comprehensive goal through their social pursuits. They may adopt and adapt, or internalise, another individual's or a group's comprehensive goal as their own.

While we distinguish between personal and Social Self-Authorship for the sake of experimental and empirical purposes, we believe that the distinction between social and Personal Self-Authorship is predominantly experiential. People may perceive their beliefs and motivations to be inherent to themselves or individual, but virtually all of our beliefs have been shaped through social sources in the past, including our upbringing and environment. Social Self-Authorship may at some point, after sufficient time and internalised repetition start to feel more individually sourced rather than the original social source when this influence cannot be remembered.

4.1.6. Group importance of behaviour.

Behaviour can be predicted by autonomous (intrinsic) motivation and autonomous motivation may be influenced through social processes. We expect social influence to be intrinsically motivating when this involves (or leads to) the internalisation of a group's comprehensive goals. We expect that the motivation to engage in a certain behaviour will be internalised only if the identity strength (identification) and identity content are sufficiently high.

Identity strength or level of identification is quite a common factor to study in the social identity literature, and is a measure of how important a group is to an individual (see Schubert & Otten, 2002). Identity strength (identification) has also been confirmed as an important predictor of environmental concern and behaviour (Schmitt et al., 2019). Identity content, the qualitative counterpart to the quantitative identification, however, is not studied nearly as often in social psychology (Turner, 2016), featuring more prominently in developmental. Identity content refers to "the semantic space associated with an identity" (Turner, 2016, p.12), which is to say how central the belief, goal, or behaviour, is to the definition or essence of the group.

We operationalise identity content as *group importance of [behaviour/goal]*, or how important a [behaviour/goal] is to the group, its core values and its members. Group importance of behaviour has been suggested to be a critical element in the internalisation of group norms for intrinsic motivation (Milovanovic, 2020). This is all to say that behaviours can only be autonomously motivated through a process of social influence if the behaviour is sufficiently important to the group and if the (in-)group is sufficiently important to a person. It is at this point that the comprehensive goal which the behaviour represents can be internalised.

Importantly, group importance of behaviour should be distinguished from descriptive and injunctive norms. A descriptive norm refers to a behaviour that is characteristic for the group, and as such people may be inclined to perform the behaviour as a matter of conformity (Cialdini & Goldstein, 2004). An injunctive norm implies what is typically approved or disapproved of and has thus, implicitly at least, a moral character. However, this may be experienced as an external social pressure to conform with the norm; a sense of ought different from Self-Governance as this does not emanate from the self (Spears, 2021). Such norms do not maintain the experience of autonomy and are thus beyond the scope of intrinsic motivation.

Thus, autonomous motivation derived from a group (Social Self-Authorship) is likely to predict a type of behaviour if:

1. The behaviour is an instantiation of a comprehensive goal;
2. The behaviour represents a social form of behaviour practised in society;
3. The behaviour is prototypical of and signifies a particular importance to a group;
4. The individual considers themselves a part of and identifies with the group;
5. The individual does not expect reprimanding or sanctions for not engaging in the behaviour;
6. The behaviour is not so commonplace in society that it loses meaning or significance as a characteristic of the identity content of the group.

4.1.7. Previous studies

In the previous studies of Chapter 3, we developed and tested the PhICAM scale for a number of different behaviours and there is some indication that different behaviours are predicted by different sub-scales of the PhICAM measure. It seemed that recycling (specifically paper and glass) was predicted by personal and Social Self-Authorship, whereas buying sustainable products (e.g., organic produce at the supermarket) was additionally predicted by Volitional Resolve. As a next step, we want to understand why different behaviours seem to be predicted by different facets of autonomous motivation, and whether it is possible to foster intrinsically motivated behaviour with social influence strategies by stimulating Social Self-Authorship.

4.1.8. The current studies.

Based on this theorising, we investigate under which circumstances different subscales of the PhICAM scale are more relevant for fostering autonomous motivation through social influence manipulations.

In Study 1, we test whether a commitment campaign for one of two environmental behaviours, framed as developed by an in-group or an out-group, is more likely to be signed by participants. Specifically, we investigate how these manipulations affect how important to one's in-group the

behaviour is perceived to be (i.e. prototypical of the group), and how this is internalised to generate autonomous motivation (mediation) to sign the commitment for the behaviour.

In Study 2, we manipulate the informational frame that accompanies the message that a specific meat tax will be introduced in the Netherlands. We are particularly interested in whether introducing such a tax under the guise of being better for the environment, better for individuals' health, or simply as a financial income for the government makes participants more likely to intend to eat less meat going forward, and particularly if this process occurs through a different form of autonomous motivation.

In Study 3, we use a larger representative sample of the Netherlands to investigate how similar news stories, manipulated to differ only in whether they convey an in-group or out-group norm, lead to differences in anticipated behaviours for types of behaviours that people are generally considered to be more ambivalent towards.

4.1.8.1. General Hypotheses

In general, we predict that there will be a direct effect of the manipulations on the outcome variable (intentions to change behaviour or signing a petition/ commitment), but we expect that this direct effect will be mediated by autonomous motivation. We further expect that the conditions that feature an in-group norm, or are presented as more socially relevant will be more likely to be internalised through Social Self-Authorship than the other conditions. Studies 2 and 3 will build on the insights gained from Study 1, just as in Study 3 we apply and implement the insights from Studies 1 and 2.

4.2. Study 1: Petition for Commitment to Behaviour

4.2.1. Introduction

This first study features a call to action from participants in the form of a commitment. These commitments will be framed as developed by either the in-group (psychology students at the participants' own university, the University of Groningen, or RuG) or an out-group (psychology students at Hanze university of applied sciences, or Hanze). Additionally, the commitments will feature one of two behaviours: reducing meat consumption or recycling electronic waste. Recycling is expected to be relatively more universal and not necessarily associated with any particular identity, whereas reducing meat consumption is less ubiquitous and does not represent a norm in each sub-culture within society. Reducing meat consumption may not be a part of everyone's identity, but it may be integral to certain groups, and be perceived as less important for other groups.

This study will demonstrate how manipulating the relevant reference group of a commitment influences the identity content (group importance of behaviour), can lead to an autonomously motivated behaviour (signing the commitment) by stimulating the internalisation of the group's goal (operationalised as Social Self-Authorship) as illustrated in the process model in Figure 4-1, below. Furthermore, it will shed light on what kinds of behaviours are more likely to be autonomously motivated through the individual components of the PhICAM scale, and which behaviours are more likely to strengthen the social component of autonomous motivation. We posit that those behaviours presented as important to the participant's in-group (rather than out-group) will be experienced as more communitarian and thus be predicted by Social Self-Authorship (rather than Personal Self-Authorship, Volitional Resolve or Self-Governance).

4.2.1.1. Hypotheses

We present our main hypotheses below:

- H1 (manipulation check): Participants will perceive a behaviour as more important to their in-group (contributing to the identity content of their in-group) when they see a commitment for the behaviour written by their in-group than when this commitment is written by an out-group.
- H2: Participants are more likely to sign a commitment if the commitment behaviour is regarded as important to their in-group.

- H3: The relationship between group importance of behaviour and actual behaviour is mediated by Social Self-Authorship (and not the other sub-scales of the PhICAM scale), representing the process of autonomous internalisation of the group goal.
- H4: The group goal is more likely to be internalised as one's own goal if the participant identifies strongly with the in-group.
- H5: A commitment about reducing meat consumption will be more effective at conveying a group importance of the behaviour than recycling electronic waste.

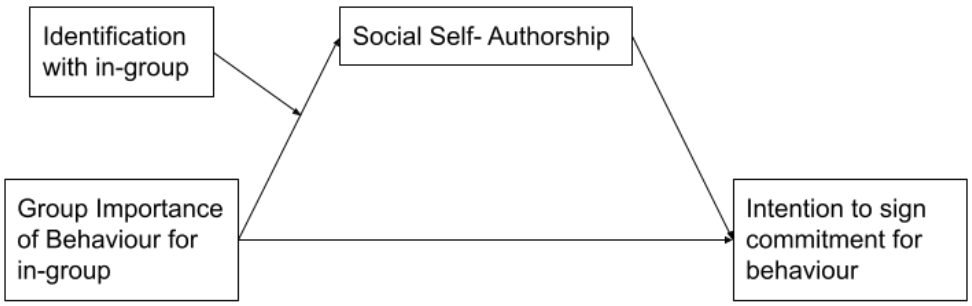


Figure 4-1: Process Model Experimental Study 1

4.2.2. Method

4.2.2.1. Design and Participants.

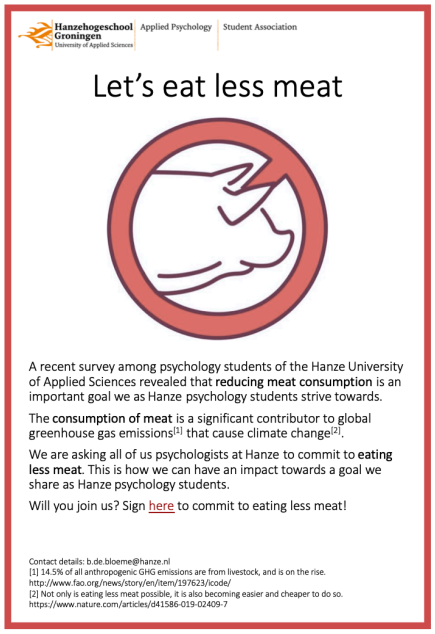
For this study, we recruited 118 participants from the first-year psychology pool of students from the University of Groningen (RuG). This study was approved by the ethics board of the university and participants were fully debriefed after participating. Participants were shown a commitment campaign. These simulated commitments will feature a call to action, presented as either a behaviour that is representative of what psychology students at the RuG (the participants' in-group) find important, or as an issue that psychology students at the Hanze (the participants' out-group) find important.

The commitment was described as designed by the participant's in-group [out-group] based on the outcome of a recent survey that revealed that psychology students at the RuG [Hanze] genuinely care about the behaviour the campaign is based on. The 'campaign' is now shared

with the participants of this study to spread the commitment campaign among new fellow RuG psychology students [students at the RuG], and because the research team is interested in what makes a commitment campaign effective. Participants either see a commitment for reducing meat consumption or recycling electronic waste.

The behaviours were chosen following a very small *pilot study* conducted among fellow environmental psychology researchers (n=8) to gauge which behaviours might be considered typically personally important and group important. The behaviour that was mentioned to be group important most frequently was dietary behaviour, specifically reducing meat consumption (mentioned by 5/7 participants). The behaviour that was considered most personally important was transport behaviour (particularly flying, which was excluded as a possibility due to limited freedom of movement following COVID-19), dietary choices (excluded as it was the most common group important behaviour) and recycling behaviour (5/8). Because our previous research also targeted waste disposal, the continuity of using recycling was also preferable. Rather than recycling paper and glass, in this study we focused on recycling E-waste (electric and electronic waste, such as batteries, light bulbs and such). We chose E-waste recycling as this is generally considered to be slightly more difficult than paper and glass recycling (Van der Werff, Steg & Keizer, 2013) and is also more standardised in different neighbourhoods across the Netherlands, whereas paper and glass have different recycling possibilities in different neighbourhoods and municipalities.

Except for the targeted behaviour and the target in-group, the commitment campaigns were designed to be as similar as possible, all featuring the same layout, type of image and message structure, and with similar references in terms of authority and reliability. The study is therefore a 2 (behaviour: reduce meat consumption vs. recycle electronic waste) X 2 (reference group: in-group fellow RuG psychology students vs. out-group Hanze psychology students) between-subjects design. The commitment campaigns that participants saw are shown in Figure 4-2, below.



Manipulations for meat and E-Waste for in-group (RuG, left) and out-group (Hanze, right)

Figure 4-2: Manipulations Experimental Study 1

4.2.2.2. Measures.

After participants give informed consent they are first asked whether they are RuG or Hanze students, intended to make their in-group salient, after which the commitment and subsequent measures is presented. These measures consist of a number of items pertaining to the (perceptions of the) behaviour; intrinsic motivation measured with the PhICAM scale developed by the research team, containing the theorised mediating variable Social Self-Authorship and a measure consisting of a more generic conceptualisation of intrinsic motivation for contrasting purposes; items pertaining to the identity content (group importance of behaviour) and strength (identification with their in-group); values and participants' demographic characteristics.

Manipulation and Commitment.

Participants are randomly allocated to one of the four conditions (in-group/ out-group and meat consumption/ E-waste recycling). After reading a cover story explaining why they are going to be shown a commitment campaign they are presented with a commitment campaign. Next, they will be asked how likely they are to voluntarily sign the commitment they have just seen (the first dependent variable). At the end of the survey, participants are presented with a link (unique to the condition they were presented with, which will take them to a new survey where they can sign the commitment. The survey has been coded to record whether participants click on this link, which gives us a binary behavioural outcome measure of intrinsically motivated pro-environmental behaviour.

Behaviour and perceptions

A single item was used to measure the second dependent variable, participants' self-reported intentions to engage in the behaviour they saw a commitment for (7-point scale, *Strongly disagree* – *Strongly agree*); the control variable of self-reported actual behaviour in the past (*Never* – *Always*); and how easy the behaviour is considered to be (*Strongly disagree* – *Strongly agree*) to see if this explains the difference between the different behaviours (meat consumption and E-Waste recycling).

Intrinsic Motivation measures

We will measure the Philosophically Informed Conceptualisation of Autonomous Motivation (PhICAM) and a 4-item measure of hedonic and eudaimonic based intrinsic motivation. PhICAM is measured with four items for each of the four subscales of autonomous motivation:

Self-Governance, Volitional Resolve, Personal Self-Authorship and Social Self-Authorship. Respondents were presented with the following question “We want to know which considerations play a role for you in deciding to eat less meat. Please indicate to what extent you agree with the following considerations.” Each of the behaviours was then included at the same level of specificity as the commitment, e.g., “Eating less meat…” or “Recycling electronic waste...” followed by four items for each of the four subscales in a randomised order. Self-Governance was measured by items including “... is the reasonable thing for everyone to do”; Volitional Resolve is measured with items such as “... is something I genuinely care about”; Personal Self-Authorship items include “... matters to me and who I aspire to be”; and Social Self-Authorship is measured with items such as “... is an ideal that is shared between myself and those important to me”. To reiterate, the Social Self-Authorship items represent the extent to which the group importance of the behaviour has been internalised and influences the individual’s decision making and behaviour. All items are measured on a 7-point scale from *Strongly disagree* to *Strongly agree.*

Besides the philosophically informed conceptualisation of autonomous motivation scale we developed, we also included a general intrinsic motivation for pro-environmental behaviour measure, consisting of four items. The measure is adapted from the work of Sharpe et al. (forthcoming) which explicitly splits intrinsic motivation into two components: hedonic and eudaimonic motivation. This measure is also asked at the same level of specificity of the PhICAM scale and the commitment the participants have seen: “Reducing my meat consumption is…”. The hedonic items are “... enjoyable” and “... pleasurable”; the eudaimonic items are “... meaningful” and “... purposeful” (7-point Likert, *strongly disagree – strongly agree*).

Importance of behaviour

Importance of beahviour is a collection of measures pertaining to how *group important* and *personally important* the behaviour is perceived to be as well as the injunctive norms and resulting extrinsic motivation associated with the behaviour. Group importance of behaviour—representing how important a behaviour is to the group, but not necessarily the extent to which this has been internalised—consists of four items (based on the single measure of Milovanovic, 2020) that ask participants to what extent they agree with statements such as “Reducing meat consumption is important to psychology students at the University of Groningen”. This measure will serve as a manipulation check to see whether the commitments

designed by fellow University of Groningen psychology students (in-group) imbue a stronger sense of group importance of behaviour than a commitment campaign designed by psychology students of the Hanze (an out-group).

Next, personal importance is measured with the same items, but in this case only pertaining to the self, e.g., “Reducing meat consumption is important to me”. Finally, injunctive norms are assessed with the two items “Other University of Groningen psychology students expect me to reduce my meat consumption” and “Most University of Groningen psychology students disapprove of me eating meat” (adapted from Minton & Rose, 1997). Finally, two items relating to the extrinsic motivation experienced as a result of the injunctive norms are surveyed, pertaining to guilt and avoiding social sanctions, e.g., “Fellow University of Groningen psychology students would make me feel guilty if I don't reduce my meat consumption”. This extrinsic motivation from injunctive norms will be contrasted with Social Self-Authorship, the internalised and motivating result of group importance of behaviour, to indicate that Social Self-Authorship represents an autonomous, intrinsic form of motivation. Participants are asked to answer all these items on a 7-point Likert scale from strongly disagree to strongly agree.

Identification

Identification is measured with respect to three groups: psychology students at the university of Groningen (in-group), psychology students at the Hanze (out-group), and psychology students in the Netherlands (the superordinate in-group). For each of these groups, the level of identification is measured using the overlap of self, ingroup and outgroup measure, where participants select one of a series of overlapping Venn diagrams that best represents the participant’s relation to the group (Schubert & Otten, 2002). Groupiness (Kuppens et al., 2022), a measure of the extent to which an individual tends to identify with groups in general, comprises eight items, including “I like building bonds with members of the same group”, all of which are measured on a 7-point scale from Strongly disagree to Strongly agree.

Values

Valules were also included in the survey for exploratory purposes and is the final scale we included related to pro-environmental behaviour. The 16 item Environmental Schwartz’s Value Scale (E-SVS, e.g., De Groot & Steg, 2008), asks participants to “Please rate the following values as guiding principles in your life.” The measure includes four subscales: hedonic (e.g., “Enjoying life: enjoying food, sex, leisure, etc.”), egoistic (e.g., “Influential: having an impact on

people and events"), altruistic (e.g., "Helpful: working for the welfare of others") and biospheric (e.g., "Protecting the environment: preserving nature"). Each item is measured on a 9-point scale (-1 = *Opposed to my Principles* and 0 = *Not important at all* to 7 = *Extremely important*).

Demographics

Finally, participants are asked to provide their gender, age and nationality. After this, participants are provided with a link to another survey where they can sign the commitment, and are subsequently brought to a debriefing which highlights that the commitment they were shown as a manipulation were not designed by their peers, but by the research team. After this, all respondents are awarded course credit.

4.2.2.3. Analysis plan.

This research features three main research questions: Are participants more likely to sign a commitment campaign if this campaign is written by people in their ingroup than if the commitment was written by members of an outgroup; is this process mediated through the Social Self-Authorship subscale of autonomous motivation; and is the mediation process moderated by the strength of identification of the participant with the target group. In order to test these hypotheses, we will conduct a moderated mediation analysis (see Figure 4-1, above) using structural equation modelling.

A mediation path analysis will investigate whether the relationship between group importance of behaviour and intentions to engage in sustainable behaviour is partially or fully mediated by Social Self-Authorship. To determine the unique contribution of Social Self-Authorship to the literature, this mediation path will also be tested for the other sub-scales of the PhICAM scale to investigate if Social Self-Authorship is unique as a form of autonomous motivation regarding the internalisation of a group's norms to lead to intrinsically motivated behaviour.

In order to test for the existence of a moderation effect of identification with the reference groups (fellow University of Groningen psychology students or Hanze psychology students), we will test for the interaction effect between identification (moderator) and group importance of behaviour to predict Social Self-Authorship. We expect that there will be a stronger relationship between group importance of behaviour for psychology students at the University of Groningen (in-group) and Social Self-Authorship for those that identify strongly with the target group (+1 SD) than those that do not identify strongly with the target group (-1 SD).

We will also exploratively investigate the moderating role of biospheric values and groupiness on the relationship between group importance of behaviour and the Social Self-Authorship subscale of autonomous motivation to engage in pro-environmental behaviours. Similarly, the role of demographic variables will also be exploratively investigated to explore if factors such as age, gender and nationality correlate with the outcome variables and the mediation process. We expect that for those that do not identify strongly, the group goal will elicit more of an injunctive norm in people, which is not expected to predict autonomous motivation to engage in a behaviour.

Previous behaviour, dietary requirements (vegetarian or vegan) and biospheric values will be used as control variables, also to see if the mediation pathway, as shown in Figure 4-1, works uniquely for different demographics, or consistently across the board for the prediction of whether someone will opt to sign a commitment (for autonomous and intrinsic reasons).

4.2.3. Results

4.2.3.1. Descriptive Statistics

As discussed in more detail in the previous chapter on scale development (Chapter 3), Study 1 demonstrated that the PhICAM scale of autonomous motivation developed by the researchers is reliable and that each of the items loads most strongly onto the factors as intended. Each sub-scale has a high reliability coefficient, with alphas ranging from $\alpha = 0.87$ for Social Self-Authorship, $\alpha = 0.89$ for Volitional Resolve, and $\alpha = 0.90$ for both Self-Governance and Personal Self-Authorship, indicating high internal consistency. Each sub-scale does correlate rather strongly and significantly with other sub scales (with Pearson's r correlation coefficients between .578 and .877; see Table 4-2, below), as is to be expected, given that, although they are different, each of the four conceptions are inherently related as different facets of autonomous motivation. The partial correlations are significantly lower, particularly between Self-Governance and Personal Self-Authorship ($r = .045$, $p<.001$) and Social Self-Authorship and Volitional Resolve ($r = .049$, $p<.001$). Interestingly, when controlling for all other PhICAM subscales, only Social Self-Authorship is significantly partially correlated with group importance ($r=.638$, $p<.001$).

Table 4-1: Multiple Group Method Experimental Study 1

			Autonomous Motivation subscales			
				Self-Authorship		
	Mean	s.d.	Self-Governance	Personal	Social	Volitional Resolve
Self-Governance (α = 0.90)	5.358	1.227				
Item 1	5.534	1.382	***0.920***	0.636	0.475	0.698
Item 2	5.475	1.400	***0.887***	0.601	0.469	0.698
Item 3	4.949	1.484	***0.869***	0.664	0.550	0.697
Item 4	5.475	1.306	***0.844***	0.649	0.539	0.682
Personal Self-Authorship (α = 0.90)	4.519	1.380				
Item 5	3.890	1.688	0.500	***0.875***	0.532	0.691
Item 6	4.915	1.465	0.749	***0.872***	0.568	0.841
Item 7	4.754	1.574	0.661	***0.848***	0.496	0.778
Item 8	4.517	1.562	0.650	***0.915***	0.557	0.780
Social Self-Authorship (α = 0.87)	3.930	1.186				
Item 9	3.915	1.291	0.410	0.407	***0.808***	0.379
Item 10	4.017	1.444	0.540	0.568	***0.895***	0.560
Item 11	3.619	1.507	0.443	0.549	***0.861***	0.501
Item 12	4.169	1.335	0.570	0.548	***0.829***	0.586
Volitional Resolve (α = 0.89)	4.883	1.367				
Item 13	5.280	1.473	0.741	0.743	0.557	***0.859***
Item 14	4.686	1.594	0.577	0.803	0.493	***0.852***
Item 15	4.839	1.659	0.752	0.744	0.515	***0.899***
Item 16	4.729	1.540	0.709	0.769	0.526	***0.877***

Note: values shown represent the correlations of each item with each of the sub-scales, corrected for autocorrelation. Values in bold indicate which of the sub-scales each of the items correlates with most strongly.

4.2.3.2. Manipulation Check

We were not able to reject the null hypothesis that participants exposed to conditions with commitment campaigns targeting the participants' in-group scored higher on the measure for group-importance of behaviour. Neither a t-test, ($M_{Out\text{-}group}$ = 3.928, $M_{In\text{-}group}$ = 3.996, t(113.18) = -.331, *p*=.742, CI = [-0.474, 0.338]), nor an ANOVA (F(1,114) = 0.101, *p*=.752) between these groups showed any indication of a successful manipulation (see Tables 4-3 and 4-4, below). Similarly, we found no evidence to conclude a significant difference exists between the

participants shown different behaviours in terms of their perception of group importance of the behaviour, neither with a t-test ($M_{Recycling}$ = 4.034, M_{Meat} = 3.890, t(115.94)=.704, *p*= .483, CI = [-0.261, 0.549]), or with an ANOVA (F(1, 114) = 0.488, *p*=.486). Given the unsuccessful manipulation, the four conditions were aggregated to test the remainder of the model.

Table 4-2: Correlation between PhICAM and Group Importance of Behaviour

	Self-Governance	Pers. Self-Authorship	Soc. Self-Authorship	Volitional Resolve	Group Importance	Intentions
Self-Governance	-	.024	.225*	.391***	-.119	.121
Pers. Self-Authorship	.725***	-	.216*	.618***	-.079	.080
Soc. Self-Authorship	.578***	.613***	-	.009	.638***	.010
Volitional Resolve	.796***	.877***	.599***	-	.051	.350***
Group Importance	.261***	.302***	.663***	.303***	-	-.042
Intentions	.661***	.699***	.471***	.765***	.210*	-

*Note: numbers above the diagonal represent the partial correlation coefficients, numbers below the diagonal represent bivariate Pearson correlation coefficients. *** p<.001, ** p<.01, * p<.05*

Table 4-3: Manipulation check Experimental Study 1

		Mean 1	Mean 2	t	df	p	CI
1	GI Meat vs. GI Recycling	4.034	3.890	.704	115.94	.483	[-0.261, 0.549]
2	GI In-group vs. GI Out-group	3.928	3.996	-.331	113.18	.742	[-0.474, 0.338]
3	PI Meat vs. PI Recycling	4.343	4.653	-1.208	108.10	.230	[-0.817, 0.198]
4	PI In-group vs. PI Out-group	4.568	4.428	.543	115.94	.588	[-0.370, 0.650]

** Group Importance (GI) and Personal Importance (PI) of behaviours for different conditions of reducing meat consumption and recycling E-waste, and in-group or out-group framing.*

Table 4-4: ANOVA of Group Importance predicted by behaviour and reference group

	df	Sum sq	Mean Sq	F	p
Behaviour	1	0.61	0.6123	0.488	0.486
Group	1	0.13	0.1260	0.101	0.752
Interaction	1	0.30	0.2975	0.237	0.627
Residuals	114	142.92	1.2537		

4.2.3.3. Confirmatory Analyses

Hypothesis 2, regarding the direct effect of perceived group importance of behaviour on willingness to sign the commitment campaign showed a positive and significant relationship following a simple regression analysis (*M*=.268, *p*=.042). This positive relationship was also established for the alternative dependent variable or intention to engage in the behaviour stipulated in the campaign (M=.261, *p*=.047) but not for the behavioural measure of individuals that actually clicked on the link provided to allow them to actually sign the commitment anonymously (M=.035, *p*=.191).

Next, we tested the model of the relationship between group importance of behaviour on the outcome variable of intention to sign the commitment, mediated by Social Self-Authorship. We reject the null hypothesis as the model was significant (F(3)=90.096, *p*<.001). The full regression model can be found in the appendix, but critically the indirect effect is significant

(M=.475, *p*<.001), while the direct effect is not (*M*=-.207, *p*=.206), indicating that the effect of group importance on the intention to sign the commitment is fully mediated by Social Self-Authorship. Results of the same nature were found to the alternative outcome measure of intention to behave in accordance with the commitment campaign (F(3)=92.951, *p*<.001; Indirect: M=.508, *p*<.001; Direct: M=-.247, *p*=.124). We did not find significant results for the mediation of the behavioural measure of whether participants clicked on the link to sign the commitment (F(3)=72.737, *p*<.001; Indirect: M=-.038, *p*=.100; Direct: M=.074, *p*=.036).

Hypothesis 4 adds to the previous model that the mediation by Social Self-Authorship of the relationship between group importance and the outcome measures is moderated by level of identification with the participant's in-group. For the intention to sign, the model is significant (F(7)=90.958, *p*<.001), and again the indirect effect fully mediates the relationship (Indirect: *M*=.355, *p*<.001; Direct: *M*=-.137, *p*=.415). However, the moderating role of identification with the participant's in-group did not significantly affect the relationship between the importance of the behaviour and Social Self-Authorship (*M*=.068, *p*=.361). In fact, Identification was also never significant as a direct effect for the mediator or the outcome measure. For the same model but with intention to adjust behaviour as the outcome variable, we find the same general trend, with a fully mediated significant model without significant moderation (F(7)=102.288, *p*<.001p; Indirect: *M*=.380, *p*<.001; Direct: *M*=.107, *p*=.505; Moderation: *M*=.068, *p*=.361), but in this case identification with RuG students was a significant predictor of intention to adjust behaviour (*M*=.245, *p*=.003). Finally, regarding the behavioural measure of clicking to sign the actual anonymous commitment, the model and direct effect were significant, and there was no significant mediation or moderation (F(7)=75.146, *p*<.001; Indirect: *M*=-.153, *p*=.093; Direct: *M*=.420, *p*=.019; Moderation: *M*=.068, *p*=.361).

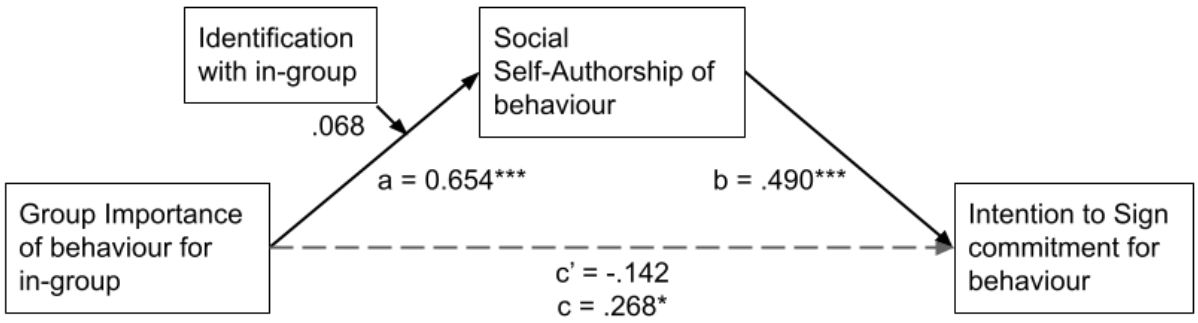
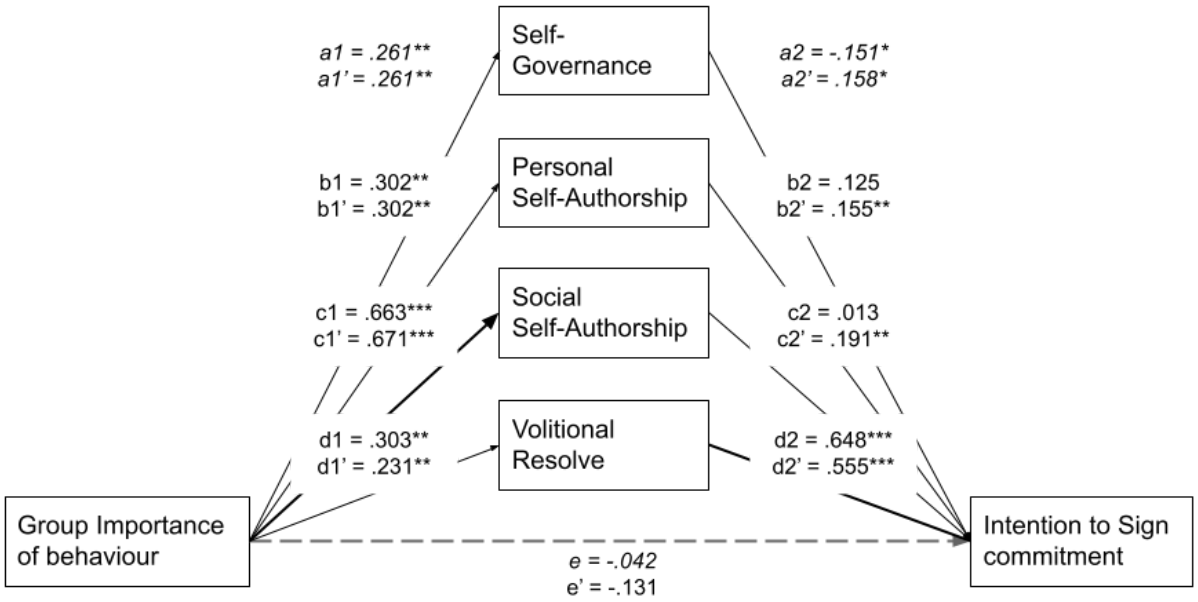


Figure 4-3: Moderated Mediation of Group Importance of Behaviour with Regression Estimates

4.2.3.4. Exploratory Analyses

For the sake of completeness and rigour, we tested whether any of the other sub-scales of the PhICAM scale were potential mediators of the relationship between group importance of behaviour and intentions. Rather than running separate regression analyses for each potentiality, we specified three structural equation models with: each of the subscales as free parameters to mediate the relationship, Social Self-Authorship as the strongest of the mediators; and Social Self-Authorship as not the strongest mediator. We then compared each of the models to see which model is best according to a number of fit indices.

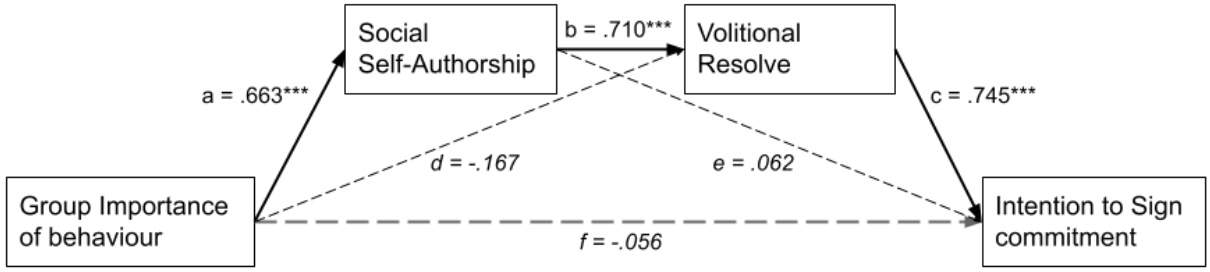
The free model (Model(6)=330.695, p<.001, CFI=.378, RMSEA=.677) shows that only Volitional Resolve was a significant predictor (M_{VR_STD}=.196, *p*=.001), beating out Social Self-Authorship (M_{SAs_STD}=.009, *p*=.885), Personal Self-Authorship (M_{SAp_STD}=.038, *p*=.114) and Self-Governance (M_{SG_STD}=.039, *p*=.080). In the restricted model where Social Self-Authorship was fixed as a stronger mediator than any of the other subscales (Model(6)=334.089, p<.001, CFI=.371, RMSEA=.681), Social Self-Authorship and Volitional Resolve are both significant mediation paths (M_{SAs_STD}=.128, *p*=.002; M_{VR_STD}=.128, *p*=.002), but Personal Self-Authorship and Self-Governance are not (M_{SAp_STD}=.047, *p*=.076; M_{SG_STD}=.041, *p*=.084). Finally, the restricted model where Social Self-Authorship was fixed as not being the strongest mediator of all the subscales (Model(6)=330.695, p<.001, CFI=.378, RMSEA=.677), is identical to the unspecified model, with Volitional Resolve as the only significant mediator (M_{VR_STD}=.196, *p*=.001; M_{SAs_STD}=.009, *p*=.885; M_{SAp_STD}=.038, *p*=.114; M_{SG_STD}=.039, *p*=.080). This points to the result that while Social Self-Authorship is a good mediator of the process, it is not the only one and not even the best one when considered separately. Furthermore, and ANOVA shows that the restricted model with Social Self-Authorship as the strongest mediator is significantly worse than the other two models (chi-sq-difference=3.3944, p<.001).



Standardized SEM estimates (top is unrestricted e.g., a1; bottom is restricted, e.g., a1').
Unrestricted SEM Mediation model Pathways:
*SG: a1*a2=.039, p=.08; SAp: b1*b2=.038, p=.114; SAs: c1*c2=.009, p=.885; VR: d1*d2=.196, p=.001*
Restricted SEM Mediation model Pathways (Social Self-Authorship is the strongest mediator):
*SG: a1'*a2'=.041, p=.084; SAp: b1'*b2'=.047, p=.076; SAs: c1'*c2'=.128, p=.002; VR: d1'*d2'=.128, p=.002*

Figure 4-4: Parallel Mediation of Group Importance of Behaviour Through all PhICAM subscales

We conducted a complementary analysis to determine whether there may be serial mediation, such that group importance of behaviour is internalised to become Social Self-Authorship, which needs to affect Volitional Resolve before influencing intentions for a behavioural change. This SEM model (Model(6)=227.916, p<.001, CFI=1.000, RMSEA<.001) is significant, and shows that indeed the serial mediation is the strongest path (M_{Serial_STD}=.350, p<.001, M_{SAs_STD}=.041, *p*=.516, M_{VR_STD}=-.124, *p*=.090). Not only is serial mediation the strongest path, but it also makes VR as an independent mediator negative and non-significant.



Serial mediation of group importance of behaviour to intention through Social Self-Authorship and Volitional Resolve with standardized SEM estimates.
Results: Serial Mediation: a*b*c = .350***, SAs Mediation: a*e = .041, VR Mediation: d*c = -.124

Figure 4-5: Serial Mediation of Group Importance of Behaviour

4.2.4. Discussion

In this first experimental study, we sought to investigate whether a commitment campaign is more effective when phrased as being important to the participant's in-group compared to the outgroup, and whether this is more effective when the targeted behaviour is reducing meat consumption (presumed to be more indicative of a group's social identity) or incorrect E-waste disposal (presumed to be less indicative of a group's social identity). Irrespective of whether participants were shown a campaign to commit to a behaviour that is important to their in-group or an out-group, participants judged the behaviour as equally important to the identity content of the group they belong to, thereby giving us no support for the first hypothesis of a successful manipulation. Similarly, there was no evidence in support of hypothesis 5, as the mean levels of group importance were not statistically different between meat consumption and for the recycling of electronics. Although the experimental manipulation proved to be unsuccessful, the remainder of the hypotheses were still testable with the rest of the model. Given that there was no statistical difference between the groups, the responses for all conditions were combined for the remainder of the analyses.

In line with our expectations for hypothesis 2 and 3, the relationship between the perceived group importance of the behaviour and the outcome variable intention to sign the commitment is fully mediated by Social Self-Authorship, using structural equation modelling (SEM). Contrary to expectations, we found no evidence that the mediation effect is moderated by the participant's identification with their in-group (hypothesis 4).

Supplementary analyses were conducted to check whether the results found are robust. Interestingly, we found that each of the subscales of the PhICAM scale produced significant mediation results from the group importance of behaviour to the intention to sign the commitment. Social Self-Authorship was predicted better by group importance of behaviour than all other PhICAM subscales. However, in line with previous research (Chapter 2, Study 1 & Study 2), Volitional Resolve is particularly effective at explaining variance in intentional outcome measures. This is not necessarily a problem for the theoretical implications of the model, but more research is needed to establish if this will always the case, given the evaluative nature of Volitional Resolve, or if a stronger manipulation can evoke more of an internalisation of a group norm to influence the intentions for a behaviour through Social Self-Authorship. The serial mediation, if replicated, could be an important insight for designing behaviour change manipulations and policies.

We propose that the reason why the manipulation of group importance of behaviour was not successful is because the salience of in-group and out-group was not strong enough.
In particular, the out-group may have simply been seen as a superordinate in-group, given that psychology students at the Hanze University of Applied Sciences would likely have been perceived to fall under the larger in-group of psychology students in the city of Groningen. As such, a commitment campaign originally designed for this ‘out-group’ may have been perceived as extending naturally to university of Groningen students, and thus not alien enough. In order to more effectively test the hypotheses regarding the manipulation, we plan a follow-up study featuring a stronger manipulation of an in-group/out-group norm.

4.3. Study 2: Frames for a Meat Tax

4.3.1. Introduction

In the second experimental study we aimed to build on the results and insights from the first study collaborating with a master student (Florieke Wattel) of environmental psychology doing an internship at the Dutch ministry of finance. The Dutch ministry of finance was particularly interested in how Dutch people would respond to a (hypothetical) meat tax and what would make people more receptive to such a tax and reducing their meat consumption.

A meat tax has the potential to change consumption habits and decrease meat consumption (Broeks et al., 2020; Lentz et al., 2018). Pricing strategies like taxes can be particularly effective when combined with other behaviour change strategies (see Lentz et al., 2018 for a meta-analysis). A meat tax is expected to be more effective citizens understand why and agree with its implementation (Lentz et al., 2018). Framing the meat tax in different ways may give consumers more context of why the tax is implemented and may support their motivation to adjust their behaviour accordingly (rather than leading to reactance).

The two main negative consequences of high meat consumption are the environmental costs of the production of the meat (with the livestock industry contributing around 18% of all greenhouse emissions worldwide; IPCC, 2022), and the negative health outcomes related to the consumption of the meat (an increased risk of e.g., cancer, heart disease, and diabetes; Godfray et al., 2018; Nelson et al., 2016; Sanchez-Sabate & Sabaté, 2019). Although these consequences of meat consumption are becoming more well-known, the extent of their consequences is generally underestimated. Although there are other consequences of meat consumption, such as animal welfare, this is generally not found to be one of the main motivators of reducing meat consumption in previous research (Letz et al., 2018), so this will not be the focus of this study.

Behavioural and pricing interventions have been shown to be more effective when combined with other interventions (Lentz et al., 2018). One way that previous research has attempted to get people to change their behaviour is to ask participants to sign a commitment to themselves to commit to changing their behaviour (Lokhorst et al., 2013). If participants are willing to sign a commitment to change a certain behaviour this will be most effective at changing their behaviour when this is experienced as active, voluntary, public and specific (Cialdini, 2001b; Lokhorst et

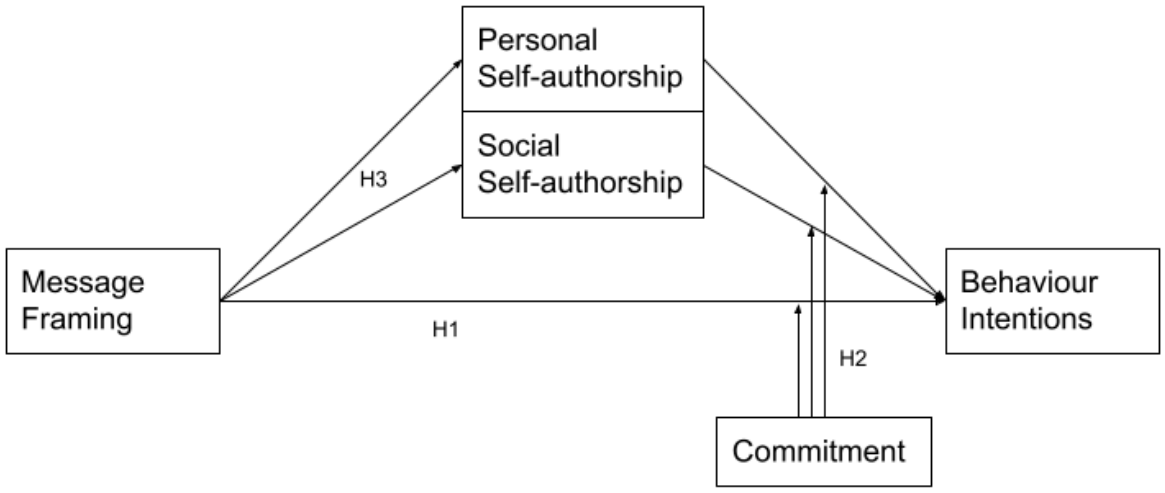
al., 2013). We also posit that at this point the commitment will be experienced as autonomously motivated.

We experimentally test how message framing (as financial, individual or social) might affect participants' intention to reduce their meat consumption, and how this is mediated by autonomous motivation. We also included commitment manipulations to see if such a simple manipulation would also influence behavioural intentions, and if this interacts with the message frame. This study is a 3x2 design of message framing (environmental framing, health framing, or control) and commitment (asked to sign a commitment or shown a control task) investigating how best to motivate people to eat less meat following the introduction of a meat tax.

4.3.1.1. Hypotheses

We seek to test the effect of message framing on the intentions to reduce meat consumption. Specifically, we expect that a message frame focusing on environmental (H1.a) or health (H1.b) consequences of (reducing) meat consumption will be more effective than a control in terms of convincing participants to eat less meat, per their behavioural intentions. We also expect that participants that are shown a commitment will have higher intentions to reduce their meat consumption if they choose to sign the commitment (H2.a), but will have a lower intention to reduce their meat consumption if they choose not to sign the commitment, relative to the control group (H2.b).

We also expect that the PhICAM scale will mediate the relationship between message framing and intentions to reduce meat consumption. Specifically, we expect that participants that are shown the environmental frame will be made more aware of the societal consequences of meat consumption, and will therefore be relatively more likely to be motivated through Social Self-Authorship (H3.a), and those shown the health frame will be made more individually aware, which will more likely be translated to a mediation of Personal Self-Authorship (H3.b).



Process model for mediation of message framing through Personal Self-Authorship (health) or Social Self-Authorship (environment) to predict meat consumption intention, strengthened by commitment.

Figure 4-6: Process Model Experimental Study 2

4.3.2. Methods

4.3.2.1. Participants

The online survey was conducted using Qualtrics (2005). In total 213 Dutch participants were recruited from the direct environment of the researchers, through social media channels (e.g., WhatsApp, E-mail, Facebook, Linked-in, and Instagram). To increase participation, a chance of winning a gift card through a lottery was offered to the participants. Participants were excluded if they indicated that they never eat meat, did not meet the age requirements, or did not give consent. This study was approved by the ethics board of the university and participants were fully debriefed after participating.

As a result, the final sample consisted of 182 participants between 18 and 30 years old (M = 23.43, SD = 2.86). This age group was chosen because the Ministry of Finance specifically asked about young adults. Young people also tend to be more open to shifting to more plant-based diets (Wynes & Nicholas, 2017), and they are more open to signing a commitment (Gollwitzer & Sheeran, 2006; Lokhorst et al., 2013).

Around 64.8% identified as female (n=118), 34.6% as male (n=63 males) and 0.5% as prefer to self-describe (n=1). Approximately 28% of the participants completed a master's degree (n=51), 36.8% completed a bachelor's degree (n=67), 14.8% completed higher vocational education (n=27), 9.3% middle level vocational education (n=17) and 11% said to have another education (n=20; most of them indicated they are still going to high school).

Health Frame

Environmental Frame

Control frame

Figure 4-7: Manipulations of information frame for the meat tax

In terms of dietary requirements, 44.4% of the participants perceived themselves as meat-eaters (n=88), 46.0% as flexitarians (n=91), 1.5% as vegetarians (n=3), 1.5% as pescatarians (n=3), 0.5% as vegans (n=1) and 5.9% as different (n=12; most of them indicating as flexitarians). Strict vegetarians and vegans were removed from the analyses as their meat consumption could not decrease any further following a meat tax intervention. This revealed a final sample of 182 participants, a sufficient sample size to find a small-medium effect size (Faul et al., 2009).

4.3.2.2. Procedure

Participants were randomly assigned to one of the three manipulation texts with information about the potential meat tax: health frame (n=62), environmental frame (n=61), or the control condition (n=59; see Figure 4-7, above). After that, they were asked to indicate how interesting they found the text.

Next, they were randomly assigned to one of two conditions: a commitment text about reducing meat consumption (n=94) or a control condition (an irrelevant commitment about listening more to podcasts, n=88; see Appendix 3). After the reducing meat commitment condition, participants were asked if they were willing to sign the commitment. Since the podcast condition was a control condition, the participants that were shown this text were only asked for their opinions on the text to match the cognitive load.

4.3.2.3. Measures

Following these manipulations, the survey continued with the measures and scales pertaining to the dependent, independent and control variables.

The dependent variable, intention to reduce meat consumption, was measured using an adapted 4-item scale based on the Fishbein & Ajzen (2011) general intention scale but adjusted to be specific to the topic of reducing meat consumption (e.g., “I plan to eat less meat”). Responses were recorded on a 7-point Likert scale from strongly disagree to strongly agree.

The Dutch translation of the PhICAM scale (as piloted in Study 3 of the scale development paper with Schneider et al., forthcoming) was asked in its entirety with a 16-item scale on a 7-point scale from strongly disagree to strongly agree. This scale uses the same subscales and items as what was used in Study 1.

Scales for attitudes, subjective norms and perceived behavioural control were included to answer a master student's research question concerning the theory of planned behaviour.

After this, participants were presented with manipulation checks for both the framing and the commitment conditions. The two manipulation checks entailed two questions, one for the informational frames and one for the commitment. The manipulation checks for the different conditions asked the participants to rate how they valued health, environmental and financial reasons for reducing their meat consumption, on a 7-point Likert scale (strongly disagree = 1 to strongly agree = 7; e.g., "How important would you rate the following reasons for reducing your meat consumption?" rating health, environment, and money). The same scale was used for the commitment manipulation check, where participants were asked to indicate how important three categories were to them: reading more books, reducing meat consumption, and listening to more podcasts.

Lastly, participants were asked to fill in some demographic questions (gender, age, education level, income bracket, dietary preference, frequency of meat consumption, and household composition. After this, participants were debriefed and given the opportunity to participate in the lottery.

4.3.2.4. Analysis plan

After checking if the manipulations have any significant effect on the manipulation checks (ANOVA), we then test the ANOVA model predicting intentions to reduce meat consumption with the information frame to test hypothesis 1. Next, we will test the ANOVA model of commitments on intention to reduce meat consumption for hypothesis 2. Finally, we will use structural equation modelling to test hypothesis 3: the mediation model for the PhICAM scale.

4.3.3. Results

4.3.3.1. Descriptive Statistics

Table 4-5: Multiple Group Method for Experimental Study 2

Items	Mean	SD	Self-Governance	Self-Authorship		Volitional Resolve
				Personal	Social	
Self-Governance	5.14	1.30				
Item 1	5.65	1.45	***0.83***	0.57	0.49	0.58
Item 2	5.15	1.52	***0.86***	0.56	0.50	0.57
Item 3	4.69	1.68	***0.87***	0.64	0.51	0.62
Item 4	5.07	1.51	***0.82***	0.61	0.54	0.63
Personal Self-Authorship	4.33	1.47				
Item 5	3.74	1.67	0.62	***0.83***	0.61	0.57
Item 6	4.64	1.62	0.63	***0.90***	0.71	0.76
Item 7	4.72	1.68	0.62	***0.88***	0.66	0.72
Item 8	4.22	1.73	0.62	***0.91***	0.75	0.71
Social Self-Authorship	4.00	1.49				
Item 9	3.93	1.76	0.51	0.68	***0.91***	0.59
Item 10	4.08	1.70	0.60	0.69	***0.91***	0.64
Item 11	3.85	1.70	0.41	0.61	***0.89***	0.52
Item 12	4.14	1.56	0.61	0.78	***0.84***	0.72
Volitional Resolve	4.76	1.31				
Item 13	5.00	1.55	0.64	0.70	0.63	***0.87***
Item 14	4.81	1.66	0.69	0.76	0.64	***0.88***
Item 15	4.47	1.49	0.59	0.64	0.58	***0.86***
Item 16	4.78	1.46	0.49	0.56	0.50	***0.80***

Note: values shown represent the correlations of each item with each of the sub-scales, corrected for autocorrelation. Values in bold indicate which of the sub-scales each of the items correlates with most strongly.

The MGM in Table 4-5, above, shows the Multiple Group Method results of the equivalent to a confirmatory factor analysis, and demonstrates that each item has the highest correlation with its own self-corrected subscale, as expected. This table shows the correlations of PhICAM items across all conditions, but the same results are found when split by manipulation condition.

4.3.3.2. Manipulation Checks

The manipulation of message framing was not successful. Participants' responses to how important environmental reasons are for reducing meat consumption were constant across conditions ($M_{Control}$=5.846, M_{Env}=5.853, M_{Health}=5.831). The ANOVA model to test differences in means of importance to reduce meat consumption for environmental reasons between these conditions was not significant (F(1,179)=.001, *p*=.974). Similarly, there were no significant differences between the means of importance for reducing meat consumption for health reasons across information frame conditions ($M_{Control}$=3.345, M_{Env}=3.705, M_{Health}=3.419); the ANOVA was not significant (F(1,179)=.031, *p*=.86).

Manipulation of commitment was checked by assessing the differences between importance of reducing meat consumption and importance of listening to podcasts for the different conditions (having seen a commitment for reducing meat consumption or listening to more podcasts). When comparing only whether participants saw a commitment for podcasts or meat consumption, there were no significant differences in responses in importance to reduce meat consumption (M_{Meat}=4.742, $M_{Podcast}$=4.580), as demonstrated by the ANOVA (F(1,179)=0.351, *p*=.554). Similarly, there were no significant differences across the same groups for how important it is to listen to podcasts (M_{Meat}=2.404, $M_{Podcasts}$=2.432; F(1,179)=.011, *p*=.916).

When including whether participants chose to sign the commitment to reduce meat consumption, we find that the three emergent groups do yield significantly different means for how important it is to reduce meat consumption (M_{Sign}= 5.273, $M_{Don't}$= 3.974, $M_{Podcast}$= 4.580). Comparing these three groups, the ANOVA demonstrates that these differences are marginally significant (F(1,179)=3.662, *p*=.0573). When only considering participants that were shown the commitment, we find that, unsurprisingly, those who opt to sign the commitment are more likely to have higher intentions to reduce meat consumption (F(1,96)=10.87, *p*=.004). This is, however, a rather trivial result.

4.3.3.3. Confirmatory Analyses

Irrespective of the manipulation checks, we continue with the proposed analyses, and conduct the ANOVA for how message framing and commitment jointly affect intention to reduce meat consumption. As is to be expected for a failed manipulation check, this two-way ANOVA demonstrates that neither informational frame nor commitment are significant predictors of intention to reduce meat consumption (*p*s>.05).

Table 4-6: Analysis of Variance for Fame and Commitment

	Df	Sum Sq	Mean Sq	F-value	Sig.
Frame (3)	1	0.7	0.7129	0.385	0.536
Commitment (3)	1	2.7	2.7200	1.469	0.227
Interaction	1	0.0	0.0401	0.022	0.883
Residuals	178	329.5	1.8510		

*Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1*

We can also compare the intentions to reduce meat consumption between just the people who have seen the commitment. Those that chose to sign the commitment had significantly higher intentions to reduce their meat consumption (M=5.707) than those that chose not to sign the commitment (M=4.884). An ANOVA demonstrated that this difference is significant (F(1,95)=8.512, *p*=.0044).

Table 4-7: Analysis of Variance for those that saw the commitment

	df	Sum Sq	Mean Sq	F value	Sig.
Frame	1	0.000	0.000	0.000	0.9992
Sign Commitment	1	16.29	16.289	8.512	0.0044 **
Residuals	95	181.80	1.914		

*Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1*

When analysing the original basic SEM model including message framing, commitment and their interaction, the model is not significant (Chi-sq(3) = 1.908, *p*=.592) and none of the estimates of the predictors are either. Given that the manipulation checks are not significant, this

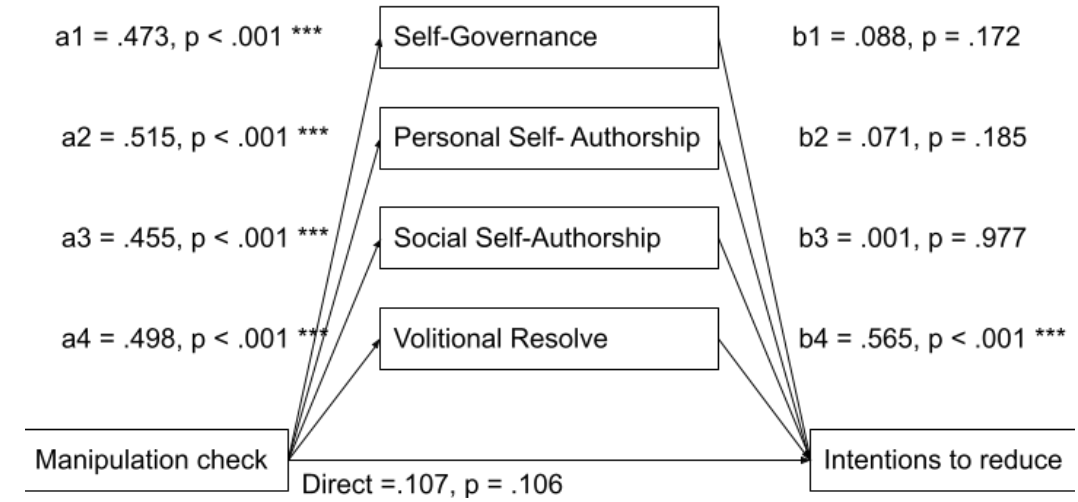
is to be expected. It does not make sense to conduct a moderated mediation structural equation model if the simple model is not significant.

4.3.3.4. Exploratory Analyses

We are only left with the possibility/opportunity to perform the structural equation modelling analyses with individual differences (on the manipulation check variable), rather than the original manipulations. This way we can analyse how important participants think environmental and health reasons are to and their relationship with intentions to reduce meat consumption. In this case, the model is significant (Chi-square(5)=73.366, p<.001) and both importance of environmental reasons and importance of health reasons are significant predictors of intentions to reduce meat consumption (Environmental=.423, p<.001 and Health=.191, p=.001). Signing the commitment and the interactions between perceived importance and commitment are all not significant (ps>.05).

We continue our analyses by looking at the role that autonomous motivation plays in explaining the relationship between message frame and commitment on intentions to reduce meat consumption. We can assess this with a mediation analysis using structural equation modelling (SEM).

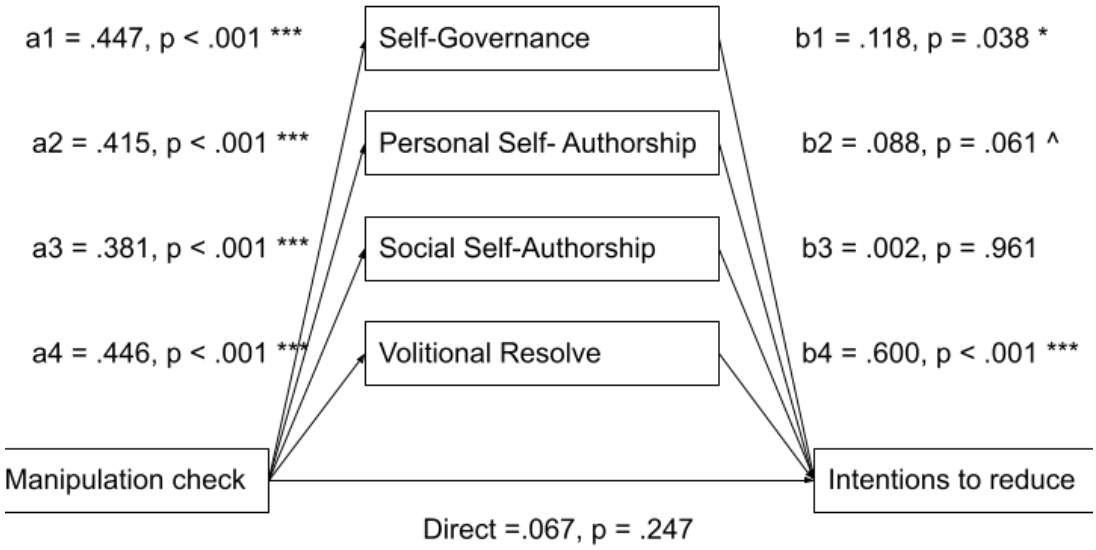
In the main SEM model, we include the importance of reducing meat consumption manipulation check as individual differences, rather than the original conditions as the independent variable (given non-significance established with the manipulation checks) combined with all PhICAM scales as mediating variables. We find that this model is not only significant (MTUM(6) = 239.760, p<.001) but the importance of reducing meat consumption is a significant predictor of all PhICAM subscales (all ps<.001), and in turn, Volitional Resolve is a significant predictor of intentions, making the Volitional Resolve mediation pathway significant (mediation pathway estimate=.281, p<.001). See Figure 4-8, below, for all coefficient estimates.



Mediation coefficients:
SG: (a1*b1)= 0.041, *p*=.175; SAp: (a2*b2)= 0.037, *p*=.188;
SAs: (a3*b3)= 0.001, *p*=.977; VR: (a4*b4)= 0.281, *p*=.000***

Figure 4-8: Parallel Mediation Importance of Reducing Meat Consumption

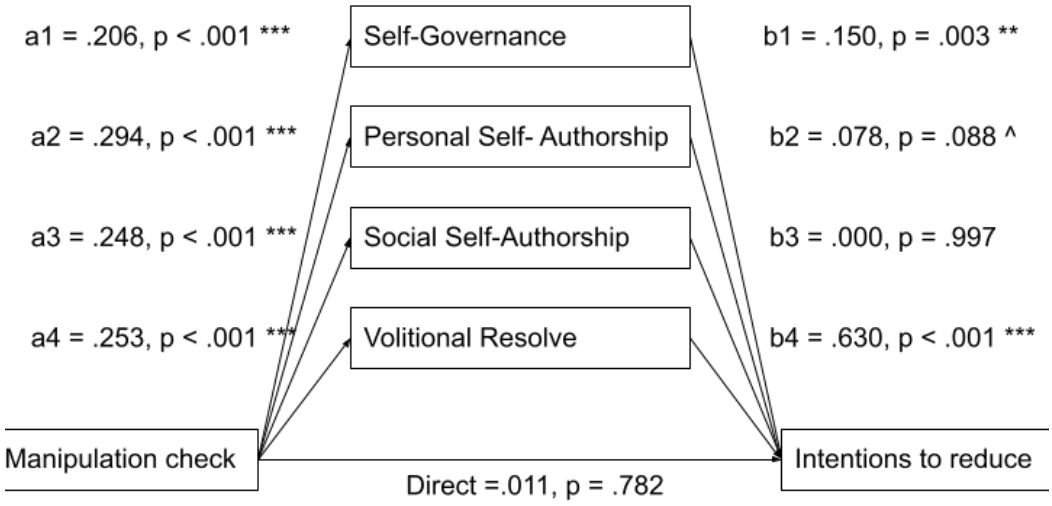
The full mediation model for the importance of reducing meat for environmental reasons as the predictor variable and the same rest of the model is also significant (MTUM(6)=367.260, p<.001). Additionally, the importance of reducing meat consumption for environmental reasons is a significant predictor of all PhICAM subscales (with all *p*s<.001), and in turn, Volitional Resolve and Self-Governance are significant predictors of intentions, making the Volitional Resolve and Self-Governance mediation pathways significant (SG=.053, *p*=.042, VR=.267, p<.001) and the Personal Self-Authorship mediation pathway marginally significant (SAp=.036, *p*=.070). See Figure 4-9, below, for all coefficient estimates.



Parallel Mediation Coefficients for PhICAM Pathways
SG: (a1*b1)= 0.053, *p*=.042*; SAp: (a2*b2)= 0.036, *p*=.070^
SAs: (a3*b3)= 0.001, *p*=.961; VR: (a4*b4)= 0.267, *p*=.000***

Figure 4-9: Parallel Mediation of Environmental Concerns

Finally, we perform the same mediation analysis with the importance of health reasons for reducing meat consumption as the predictor variable, the model is also significant (MTUM(6)=367.260, p<.001). Additionally, the importance of reducing meat consumption for environmental reasons is a significant predictor of all PhICAM subscales (with all *p*s<.001), and in turn, Volitional Resolve and Self-Governance are again significant predictors of intentions, making the Volitional Resolve and Self-Governance mediation pathways significant (SG=.031, *p*=.012, VR=.160, p<.001) and the Personal Self-Authorship mediation pathway marginally significant (SAp=.023, *p*=.100). See Figure 4-10 below for all coefficient estimates.



Parallel Mediation Pathway Coefficients for PhICAM
SG: (a1*b1)= 0.031, *p*=.012*; SAp: (a2*b2)= 0.023, *p*=.100^
SAs: (a3*b3)= 0.000, *p*=.997; VR: (a4*b4)= 0.160, *p*=.000***

Figure 4-10: Parallel Mediation for Importance of Health Reasons

Given that for each of these analyses Volitional Resolve was best predicted of the PhICAM subscales and the best predictor of intentions, there is no added value of testing for serial mediation.

4.3.4. Discussion

First, it must, of course, be acknowledged that the manipulation checks for the different conditions were not significant. This means that it was not possible to reject the null hypothesis for any of the initial hypotheses: there was no direct effect of framing on intentions to reduce meat consumption (H1); there was only a marginally significant effect of commitment on intentions when accounting for whether participants chose to sign or not to sign (H2); and there was no significant mediation of the direct effect of framing on intentions through the PhICAM scale (as this effect did not exist to begin with; H3).

All subsequent analyses were conducted with an internal analysis, using individual differences, with the limitations that entails. We could no longer interpret the effects of the manipulation as there were none. The resulting insights may seem slightly trivial. Nonetheless, what we can learn from these mediation analyses is that in each case Volitional Resolve seems to be the strongest when it comes to predicting intentions and mediating the relationship between beliefs (of importance of reducing meat consumption, the importance of environmental reasons to reduce meat consumption and the importance of health reasons to reduce meat consumption) and intention to reduce meat consumption

For general beliefs about the importance of reduced meat consumption, only Volitional Resolve was significant. For environmental reasons for reduced meat consumption, Volitional Resolve and Self-Governance were significant, and Personal Self-Authorship was marginally significant. For health reasons for reduced meat consumption, Volitional Resolve and Self-Governance were significant, and Personal Self-Authorship was again marginally significant. Interestingly, Social Self-Authorship was never significant, despite bringing up environmental societal/global matters in the manipulation. It may be that a stronger social manipulation is necessary to make people believe that their surroundings are a source of the norms that they may internalise as Social Self-Authorship. The manipulation in this study focused more on the effects on an individual and society, but not so much on the norms that individuals and groups hold, which may explain why the manipulation was not generally effective at changing intentions or autonomous motivation.

There was no reason to test for serial mediation in this instance as Volitional Resolve was the best predicted of the subscales and the best predictor of intentions.

4.3.4.1. Limitations

The sample was obtained through convenience sampling in a master student's personal network. This sample clearly seemed to care for environmental reasons irrespective of the condition they were assigned to as the median response for importance of reducing meat consumption for environmental reasons was subject to ceiling effects. Perhaps a more representative sample of participants would have demonstrated some more variance in their responses, which could have made it easier to find significant manipulation effects (it is hard to make people more aware of something they are already aware of).

The sample was selected based on their age both for this age bracket being more likely to make the long-term behavioural changes regarding shifting away from meat-based diets (Wynes & Nicholas, 2017), and have been found to be more likely to sign a commitment (Gollwitzer & Sheeran, 2006; Lokhorst et al., 2013). Finally, this sample was also chosen as this was a target group of particular interest for the Dutch Ministry of Finance, with whom this research was conducted. Given how important the internalisation of a group norm is posited to be for Social Self-Authorship, this may have been a combined issue of the sample and the behaviour selected, and this will be addressed in a follow-up study.

Finally, the main issue regarding specificity is that generally manipulations with a focus on social norm manipulations are especially effective when they demonstrate a (large) majority social agreement, particularly within a group that the subject is a part of and identifies with (Cialdini, 2001a; Cialdini & Goldstein, 2004). Unfortunately, this manipulation did not focus on conveying a specific value as being normative within a group that the participants identify with. An attempt was made to convey group importance through the environmental argument, but this still did not include an actual norm. Future research should focus on demonstrating a group norm that is convincing, specific and targeted to the participants.

Finally, the sampled behaviour of eating less meat has been increasingly popular for scientific study (e.g., a single meta-analysis reviewed 100 studies on reducing meat consumption using animal welfare appeals alone; Mathur et al., 2021), and in media coverage (Cordts et al., 2014; Happer & Wellesley, 2019). Future studies should opt to focus on behaviours that are less likely for participants to have strong opinions about already. Perhaps when participants are undecided or ambivalent towards certain behaviours they might be more likely to be swayed by certain arguments.

4.4. Study 3: Representative Sample

4.4.1. Introduction

Results from Study 1 of this chapter proposed that group norms can be internalised to inform autonomous motivation in the form of Social Self-Authorship. This is to say that the more salient a group's norms are to an individual, and this is a group that a participant belongs to/identifies with (i.e., the more important the behaviour is to the identity content of the group) the more the behaviour will be internalised as autonomous motivation and predict subsequent (intentions for) behaviour. Of course, if the norm someone is exposed to is not viewed as particularly important or defining of one's in-group, it is less likely that the norm will be adopted as one's own through this process of internalisation as Social Self-Authorship. Additionally, if identification with the in-group is not sufficiently greater than the out-group, then such a manipulation is also unlikely to be successful.

Study 2 also added to the speculation of Study 1 that the behaviours sampled so far may have been too common for a simple social norm intervention to develop any new, measurable autonomous motivation that the individual did not already possess. Generally, people already have an opinion about most things that are common in society. There are some behaviours that people are generally more ambivalent towards. Scholars have by and large assumed that polarising societal debates tend to lead people to take a well-defined stance on an issue. Some individuals, however, may not take a stance in favour or against an issue, but rather remain ambivalent (Ton et al., 2023).

For someone to be ambivalent this means that they may have "mixed reactions, feel torn and conflicted and/or being undecided" (Ton et al., 2023, p.31). This may be especially expected for behaviours pertaining to climate change which may be experienced as overwhelming, confusing, complex or sacrificing. The ambivalence towards certain environmental behaviours may be more likely to be explained by personal opinion discrepancy, whereas ambivalence for other behaviours may be explained more by social tensions, and therefore more likely to be subject to influence through a changing observed social norm. In previous studies, meat consumption was found to be linked more to personal opinion discrepancy rather than social or societal forces. This may be because it is a personal behaviour, and is not necessarily as polarising as other debates as meating meat is not merely a binary behavioural choice. There are a number of intermediate dietary options that range from being particularly high in meat

consumption to veganism with options in between like flexitarianism (rarely eating meat), pescatarianism (eating fish but no other meat) and vegetarianism (not eating meat; Dagevos & Voordouw, 2013; Ton et al., 2023).

Rather than focusing on a behaviour that is personal, not particularly polarising and well-established (such as meat consumption), it may be more plausible to autonomously motivate people through a social norm intervention for a behaviour that people may not already have fully formed opinions. This may be because it is less well-known, less grounded in experience, a complex or complicated topic, or has not been featured in social debate. Such behaviours may make it more likely that participants are not only ambivalent, but that this ambivalence might be grounded in social discrepancy (Ton et al., 2023), and therefore more likely for positions to be readjusted through a social norm intervention which may be experienced as autonomously motivating.

The Netherlands in particular is an interesting place when it comes to climate change policy and the energy transition. Broadly seen as innovative and progressive, the Netherlands likes to present itself as a leader in the face of mitigating and adapting to climate change. Mark Post and his team developed the very first lab-grown hamburger from cultured cells in 2013 at the University of Maastricht in the Netherlands (Post, 2012). Since then, however, lab-grown meat is still not available in the Dutch market, and the Netherlands is not a leader in bringing this technology to the masses. There are, however, some elements of Dutch society that are less amenable to the energy transition. Nuclear power in the Netherlands is a somewhat polarizing topic as 46% of the populations reported wanting more nuclear plants, 25% wanting less, 15% responded they do not know and only 14% reported they were happy with the current state of affairs (Van der Schelde & Kanne, 2021).

Despite being a relatively small country, there are also quite some differences within the different regions of the Netherlands. In the Netherlands there is a region or conurbation known as the Randstad or *Edge-city*, which is a crescent shaped area in the West of the Netherlands that includes Amsterdam, Rotterdam, The Hague and Utrecht, the four largest cities as well the area connecting these cities. Generally, this area is more urban than the rest of the country, and tends to be more liberal and progressive (Verheul & Besamusca, 2014). People from the Randstad are generally perceived to be more in favour of new environmental standards, whereas outside of the Randstad, there is a shared sentiment that national policy tends to be biased towards those in the Randstad, and that people outside the Randstad are treated as an

afterthought (Verheul & Besamusca, 2014). It is in this region, where more of the livestock farming in the country is done, that there tends to be more support for the farmers and their protests of new environmental policies that affect their livelihoods (see also the success of the Boer Burger Beweging political party [farmer citizen movement] in recent elections; NOS, 2023).

In this study we are interested in seeing whether it is possible to experimentally manipulate the extent to which a social norm is internalised, depending on whether participants are shown an in-group or out-group norm. In order to do so, and given our struggle to demonstrate this effect in the past, we have selected behaviours based on our findings from the pilot that suggested participants may be more ambivalent towards these behaviours. This seems important as it makes sense that it would be more difficult to affect someone's motivation to engage in a certain behaviour when they have their minds firmly made up. This study was approved by the ethics board of the university, and pre-registered on the Open Science Framework before data collection on 11 November 2022 (https://doi.org/10.17605/OSF.IO/VPEF7).

4.4.1.1. Hypotheses

H1. When shown an in-group manipulation, participants will be more in-favour of supporting relevant policy than with an out-group manipulation.

H2. When participants are shown an in-group manipulation for a group norm, they will report higher motivation on the Social Self-Authorship sub-scale of autonomous motivation to engage in that behaviour than when shown an out-group social norm manipulation.

H3. Higher autonomous motivation (and particularly Social Self-Authorship) is positively related to policy support.

H4. Social Self-Authorship (subscale of autonomous motivation) mediates the relationship between the manipulation of group norms and policy support.

H5. In fact, there is expected to be a serial mediation from the group norm manipulation to Social Self-Authorship (which encapsulates the internalisation of group norms as one's own) to Volitional Resolve (another sub-scale of autonomous motivation that captures an evaluation of

what a participant prioritises and genuinely cares about) and finally to policy support. This serial mediation is expected to explain more variance than the simple mediation.

H6. We predict that psychological distance between the in-group and out-group will predict the difference in internalisation of group-norms for the in-group and out-group for each behaviour. Thus, we expect the effect sizes of the manipulations to be largest for lab grown meat, followed by nuclear energy, followed by farmers' protests. The manipulation for lab grown meat will show the largest psychological difference between the in-group and the out-group, given that for our sample (Dutch people) the out-group for this behaviour (Singaporeans) is likely to be seen as more psychologically distant than for the other behaviours (Germans for nuclear energy; or fellow Dutch people from a different region for farmers' protests). Similarly, we expect the farmers' protests manipulations to be least effective, given that in this case participants are most likely to consider a superordinate in-group and thus not perceive the out-group manipulation as particularly external.

Interaction effects

H7. If a participant is more ambivalent toward a behaviour they are more likely to internalise a group norm manipulation and subsequently be more autonomously motivation to engage in a behaviour or support relevant policy.

H8. If a participant identifies more strongly with a relevant in-group, we expect a stronger relationship between an in-group norm manipulation and a participant's autonomous motivation to engage in a behaviour.

4.4.2. Methods

4.4.2.1. Research Participants and Procedure

Participants were recruited through Panel Inzicht, a panel agency that specialises in representative sampling of Dutch residents for (academic) surveys between December 2022 and February 2023.

Participants were sent invitations to participate in the survey based on quotas recommended by the panel service, ensuring that a representative sample would be attained. This included a quota for education level, region of residence within the Netherlands, and a combined quota of gender and age. Sample demographics and quota can be seen in Tables 4.8 – 4.10, below.

Any participants that completed the survey in less than 5 minutes were discarded, as were participants that failed the attention check, for a total retention rate of 68%. After this deletion of data for quality purposes, the final sample comprised a representative sample of 1014 Dutch adults, ranging from 18 to 65+, distributed across the age ranges and genders conform to the nationally representative distributions (male = 500, female = 501, Other/prefer not to say = 13). Participants took around 15 minutes (median = 14.43, trimmed mean = 15.92 minutes) to complete the survey in Dutch, hosted on Qualtrics, using any device with an internet connection.

The sample was shown to be representative of the Dutch population. There was no evidence of a difference between sampled and actual age and gender distributions (Chi-sq(3) = 0.692, *p*=0.875), actual or sampled education levels (Chi-sq(2) = 0.024, *p*=0.988) or actual or sampled region of origin (Chi-sq(4)=0.742, *p*=0.946).

Table 4-8: Demographics Experimental Study 3, Age and Gender

	Age				
Gender	18-34	35-49	50-64	65+	*Total*
Male	136 (140)	121 (120)	133 (130)	110 (110)	500 (500)
Female	130 (130)	120 (120)	129 (130)	122 (130)	501 (510)
Other/ Prefer not to say	6	4	3	0	13
Total	271	245	264	232	1014
Chi-Sq (3)=0.692, p=.875					
Values in parentheses represent nationally representative sample goals, used for Chi-sq.					

Table 4-9: Demographics Experimental Study 3, Nielsen Regions of Netherlands

Nielsen Region	Sample (Rep.)
Amsterdam, Rotterdam or Den Haag and their suburbs	163 (160)
North Holland, South Holland or Utrecht *(excluding 3 cities mentioned above)*	289 (300)
Groningen, Friesland, Drenthe	103 (100)
Overijssel, Gelderland, Flevoland	213 (210)
Zeeland, Noord Brabant, Limburg	246 (240)
Chi-sq (4) = 0.742, *p*=0.946	
Values in parentheses represent nationally representative sample goals, used for Chi-sq.	

Table 4-10: Demographics Experimental Study 3, Education Level

Education Level (defined by Panel Service)	Sample (Representative)
Low	212 (210)
Middle	401 (400)
High	401 (400)
Chi-sq (2) = 0.024, *p*=0.9881	
Values in parentheses represent nationally representative sample goals, used for Chi-sq.	

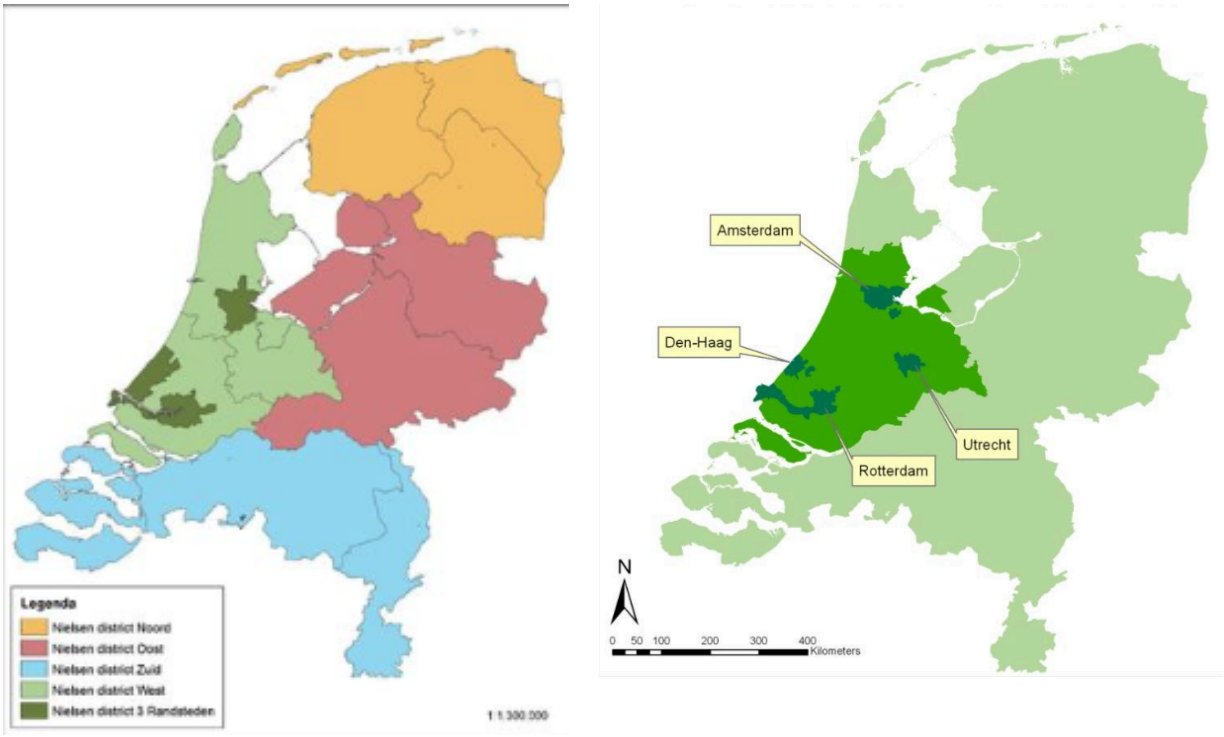
Demographics

After giving their consent to participate in the survey, participants were asked a few demographic questions. If the quota was full for any of their demographic factors, they would be screened out of the survey, otherwise they would be allowed to continue.

To establish eligibility based on demographic quotas, the panel service includes a question about which *Nielsen* region in the Netherlands they are from (these regions are common to the participants as they are primarily used for market research purposes such as this panel). Roughly 46% of the Dutch population and this sample is from the provinces of North Holland, South Holland and Utrecht, which is a close enough proxy for the Randstad, despite erroneously including certain parts of North Holland, and omitting Almere, which is in the province of Flevoland; see Figure 4.11, below). Given that this has the extra benefit of keeping the maintaining near equality of groups condition required for ANOVA, we use this operationalisation as being from the Randstad.

Manipulations

Participants were then randomly allocated to a series of manipulations featuring news article clippings—about lab grown meat, nuclear power, and farming protests—that had been changed slightly by the researchers to include an in-group norm or out-group norm.



a) Nielsen regions 1 and 2 (Greens) are used as operationalisation of Randstad

b) Darker shaded area commonly referred to as the Randstad

Figure 4-11: Actual Randstad compared to Nielsen operationalisation used in the study.

Behaviours on which the manipulations are based were selected following a pilot study with 106 participants sampled through the same panel service, and ensured to be nationally representative. In this pilot, participants were asked about their ambivalence towards a number of supposed pro-environmental behaviours (see Appendix A.2., for the behaviours and means). Behaviours were selected for the follow-up main study based on the average scores on the ambivalence scale, and for being deemed particularly relevant or interesting for follow-up.

Manipulations were in the form of a digital newspaper clipping from the NOS (Dutch national news station) which was either a mostly original piece, or had been doctored to present a

different in-group or out-group norm for the environmental behaviour than the original news article (see Figures 4.12.a-f, below).

In the case of lab grown meat, participants were either shown an article about Singapore being the first country to legalise the sale and consumption of lab grown meat, with a mention of a poll where the majority of Singaporean respondents said to be in favour of replacing their meat consumption with lab grown meat (the original, unedited version; NOS, 2020), or the same story but replacing every mention of Singapore and Singaporean people with the Netherlands and Dutch people.

For nuclear power, the original article discussed the Netherlands deciding at the last minute that they want to build new nuclear power stations to speed up their transition away from fossil fuels (NOS, 2022b). If further stipulated that people were, for the first time in decades in favour of building more nuclear power plants again. For the manipulation to be made an out-group norm for the Dutch sample, any mention of “the Netherlands” was changed to “Germany”.

Following new government policy limiting the amount of nitrogen dioxide that livestock farms are allowed to emit, some farmers and groups representing farmers’ interests in the Netherlands started protesting en masse, including blocking off highways. For the farmers’ protests manipulation, the news article clipping mentions either that particularly people from the Randstad are actually more sympathetic to the farmers’ cause than previously polled, or that people from outside the Randstad are more in favour of the farmers’ right to protest against the climate change policies. Both conditions featured a slightly amended version of the original news article (NOS, 2022a). In this case, the in-group is dependent on where participants are from themselves (inside or outside the Randstad).

After the manipulations, participants were presented with a number of scales and other measures pertaining to policy agreement, autonomous motivation, ambivalence, efficacy and attitudes, before they were debriefed and financially compensated for their time.

Lab grown meat:
Netherlands

NOS Nieuws Sport Uitzendingen

NOS Nieuws · Maandag 3 oktober 2022, 21:03 ·
Aangepast dinsdag 4 oktober 2022, 12:51

Nederland staat als eerste land verkoop van kweekkip toe

Inwoners van Nederland kunnen binnenkort kipnuggets eten die niet van geslachte kippen zijn gemaakt, maar zijn gekweekt in een bioreactor. Als eerste land ter wereld heeft de Nederlandse regering toestemming gegeven voor de verkoop van een vorm van kweekvlees. Het gaat om het Nederlandse bedrijf Eat Just dat z'n chicken bites aan de man mag brengen.

Wanneer de nuggets precies te verkrijgen zijn is nog onbekend, net als wat een portie gaat kosten. Volgens Eat Just zal de prijs te vergelijken zijn met die van echt kippenvlees van goede kwaliteit.

In eerste instantie zal één restaurant de kweekkip verkopen. Daarna volgen andere restaurants en weer later supermarkten, hoopt Eat Just. Het bedrijft verwacht dat de gekweekte kip op termijn goedkoper is dan vlees van geslachte kippen.

Dat Nederland het kweekvlees nu heeft goedgekeurd voor verkoop, is deels ingegeven door de toename in andere vegetarische vleesalternatieven. Sinds 2013 is de consumptie van vleesvervangers in Nederland sterk toegenomen. Ook is er veel hogere interesse in kweekvlees, en uit onderzoek van het Citisens panel blijkt dat zo'n 73% van de Nederlanders overweegt om hun vlees met kweekvlees te vervangen.

Serum van ongeboren kalfjes

Lange tijd was de discussie bij kweekvlees of je het wel volledig diervriendelijk zou kunnen noemen. In de beginjaren van de ontwikkeling van kweekvlees werd voornamelijk gebruik gemaakt van zogenoemd foetaal kalfsserum.

Omdat één van de doelen van kweekvlees juist het tegengaan van dierenleed is - naast de nadelige effecten die het houden van levend vee heeft op het klimaat - zijn bedrijven hard op zoek naar alternatieven voor foetaal kalfsserum. Eat Just claimt daarmee succes te hebben en een plantaardig serum te hebben gevonden. Maar voor de productie in Nederland wordt in eerste instantie nog wel foetaal kalfsserum gebruikt.

Singapore

NOS Nieuws Sport Uitzendingen

NOS Nieuws · Maandag 3 oktober 2022, 21:03 ·
Aangepast dinsdag 4 oktober 2022, 12:51

Singapore staat als eerste land verkoop van kweekkip toe

Inwoners van Singapore kunnen binnenkort kipnuggets eten die niet van geslachte kippen zijn gemaakt, maar zijn gekweekt in een bioreactor. Als eerste land ter wereld heeft de Aziatische stadstaat toestemming gegeven voor de verkoop van een vorm van kweekvlees. Het gaat om het Amerikaanse bedrijf Eat Just dat z'n chicken bites aan de man mag brengen.

Wanneer de nuggets precies te verkrijgen zijn is nog onbekend, net als wat een portie gaat kosten. Volgens Eat Just zal de prijs te vergelijken zijn met die van echt kippenvlees van goede kwaliteit.

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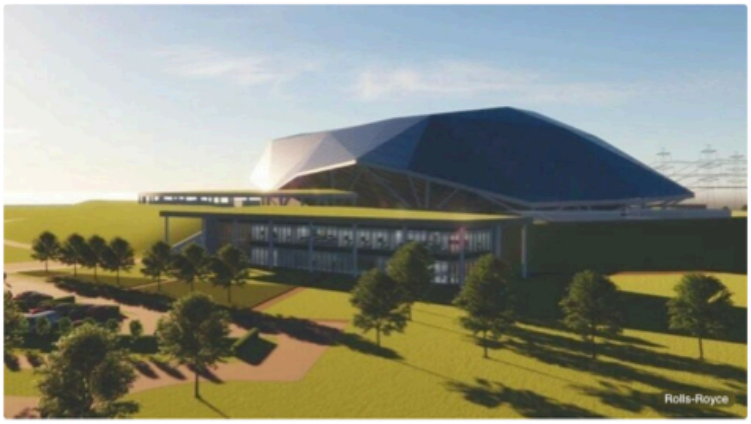
Omdat één van de doelen van kweekvlees juist het tegengaan van dierenleed is - naast de nadelige effecten die het houden van levend vee heeft op het klimaat - zijn bedrijven hard op zoek naar alternatieven voor foetaal kalfsserum. Eat Just claimt daarmee succes te hebben en een plantaardig serum te hebben gevonden. Maar voor de productie in Singapore wordt in eerste instantie nog wel foetaal kalfsserum gebruikt.

Nuclear power:
Netherlands

NOS Nieuws Sport Uitzendingen



nieuwsuur

Donderdag 6 oktober, 16:00

Toch kernenergie in Nederland, met kleinere centrales?

Yoeri Vugts
redacteur Nieuwsuur

Piet de Blaauw

Gedwongen door de huidige energiecrisis is kernenergie in veel landen weer bespreekbaar. In Japan gaan kerncentrales weer draaien, Engeland schuift de sluiting van enkele centrales voor zich uit en ook België heeft geplande sluitingen teruggedraaid.

In Nederland staat het kabinet open voor nieuwe centrales, een besluit daarover wordt dit najaar genomen. Volgens recente peilingen is de Nederlandse bevolking voor het eerst in decennia is weer van mening dat er meer kernreactoren moeten komen op Nederlandse bodem.

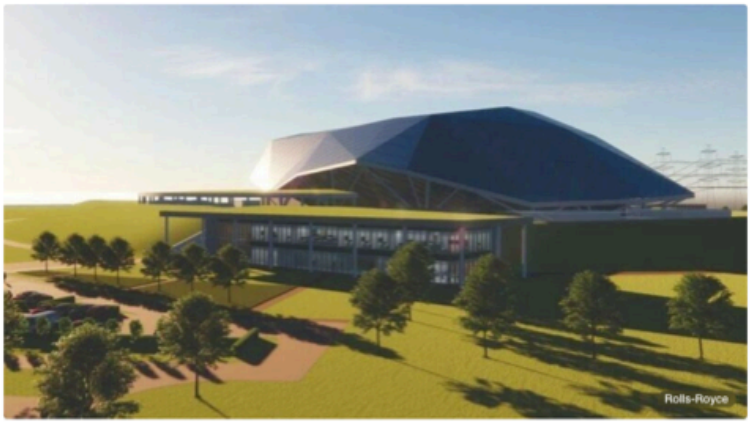
In de fabriek van Rolls-Royce in het Engelse Sheffield omarmen ze de Nederlandse ambities op het gebied van kernenergie. De fabrikant die vooral bekend is van vliegtuigmotoren en auto's, stapt ook in de markt van kerncentrales. Het gaat om zogenoemde Small Modular Reactors (SMR's), een ander type kerncentrale dan die in het Zeeuwse Borssele.

Bouwpakket

Het bouwen van een kerncentrale kost nu nog vele jaren en miljarden euro's per centrale. Het idee achter de SMR is dat ze als een serieproduct van de band kunnen rollen en daarmee goedkoper zijn. Rolls-Royce stelt dat de bouwtijd vijf tot zeven jaar is. Het eerste exemplaar kost 2,5 miljard euro, maar daarna moeten de kosten zijn teruggelopen tot 2 miljard per centrale.

SMR's zijn centrales die in de fabriek worden gemaakt. Anders dan de traditionele kerncentrales zijn het een soort bouwpakketten die op locatie in

NOS Nieuws Sport Uitzendingen



nieuwsuur

Donderdag 6 oktober, 16:00

Toch kernenergie in Duitsland, met kleinere centrales?

Yoeri Vugts
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Gedwongen door de huidige energiecrisis is kernenergie in veel landen weer bespreekbaar. In Japan gaan kerncentrales weer draaien, Engeland schuift de sluiting van enkele centrales voor zich uit en ook België heeft geplande sluitingen teruggedraaid.

In Duitsland staat het kabinet open voor nieuwe centrales, een besluit daarover wordt dit najaar genomen. Volgens recente peilingen is de Duitse bevolking voor het eerst in decennia is weer van mening dat er meer kernreactoren moeten komen op Duitse bodem.

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Bouwpakket

Het bouwen van een kerncentrale kost nu nog vele jaren en miljarden euro's per centrale. Het idee achter de SMR is dat ze als een serieproduct van de band kunnen rollen en daarmee goedkoper zijn. Rolls-Royce stelt dat de bouwtijd vijf tot zeven jaar is. Het eerste exemplaar kost 2,5 miljard euro, maar daarna moeten de kosten zijn teruggelopen tot 2 miljard per centrale.

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Farmers' Protests:
Randstad

NOS Nieuws Sport Uitzendingen

NOS Nieuws • Maandag 15 augustus, 17:23 •
Aangepast maandag 15 augustus, 21:22

Afgelopen weken ruim honderd arrestaties na boerenprotesten

Rondom de boerenprotesten van de afgelopen weken zijn ruim honderd personen aangehouden, meldt de politie. Het gaat om overtredingen en misdrijven zoals snelwegblokkades, brandstichtingen en afvaldumpingen. Ook schreef de politie meer dan 700 bekeuringen uit.

De politie heeft geen exacte cijfers over de bekeuringen en aanhoudingen die te maken hebben met de protesten, maar wel staat vast dat sinds het eerste grote boerenprotest in Stroe op 22 juni het aantal bekeuringen "opvallend sterk" is gestegen, zegt nationaal commandant Woelders. Zo zijn de afgelopen weken 186 boetes uitgeschreven voor rijden op de snelweg met trage motorvoertuigen, en 212 boetes voor stilstaan op de rijbaan.

Van de ruim honderd aangehouden mensen is een kwart niet ter plaatse gearresteerd; zij werden later opgespoord door de politie en alsnog aangehouden. Enkelen zitten nog vast, onder wie de drie mannen die in de afgelopen twee weken werden opgepakt voor het dumpen van afval op de A7, zegt de politie.

Begrip voor boerenacties in de Randstad

Nationaal commandant Woelders kwam onder vuur te liggen toen hij in een interview met NRC begrip uitte voor de boerenacties. "Veel mensen in de Randstad hebben begrip voor de positie van de boeren, ik ook", zei hij in het interview van 30 juni. Hij zei vandaag in het radioprogramma Dit is de Dag er spijt van te hebben dat hij dit niet eerder gecorrigeerd heeft.

Binnen de politie leidden zijn uitspraken tot onrust. Ook kwamen er klachten van agenten bij de Nederlandse Politiebond. "Als collega's hier last van hebben gehad is dat zeker reden voor excuus," reageerde Woelders op de radio.

Protest tegen stikstofplannen

Boeren hebben in de afgelopen maanden fel geprotesteerd tegen de

Non-Randstad

NOS Nieuws Sport Uitzendingen

NOS Nieuws • Maandag 15 augustus, 17:23 •
Aangepast maandag 15 augustus, 21:22

Afgelopen weken ruim honderd arrestaties na boerenprotesten

Rondom de boerenprotesten van de afgelopen weken zijn ruim honderd personen aangehouden, meldt de politie. Het gaat om overtredingen en misdrijven zoals snelwegblokkades, brandstichtingen en afvaldumpingen. Ook schreef de politie meer dan 700 bekeuringen uit.

De politie heeft geen exacte cijfers over de bekeuringen en aanhoudingen die te maken hebben met de protesten, maar wel staat vast dat sinds het eerste grote boerenprotest in Stroe op 22 juni het aantal bekeuringen "opvallend sterk" is gestegen, zegt nationaal commandant Woelders. Zo zijn de afgelopen weken 186 boetes uitgeschreven voor rijden op de snelweg met trage motorvoertuigen, en 212 boetes voor stilstaan op de rijbaan.

Van de ruim honderd aangehouden mensen is een kwart niet ter plaatse gearresteerd; zij werden later opgespoord door de politie en alsnog aangehouden. Enkelen zitten nog vast, onder wie de drie mannen die in de afgelopen twee weken werden opgepakt voor het dumpen van afval op de A7, zegt de politie.

Begrip voor boerenacties buiten de Randstad

Nationaal commandant Woelders kwam onder vuur te liggen toen hij in een interview met NRC begrip uitte voor de boerenacties. "Veel mensen buiten de Randstad hebben begrip voor de positie van de boeren, ik ook", zei hij in het interview van 30 juni. Hij zei vandaag in het radioprogramma Dit is de Dag er spijt van te hebben dat hij dit niet eerder gecorrigeerd heeft.

Binnen de politie leidden zijn uitspraken tot onrust. Ook kwamen er klachten van agenten bij de Nederlandse Politiebond. "Als collega's hier last van hebben gehad is dat zeker reden voor excuus," reageerde Woelders op de radio.

Protest tegen stikstofplannen

Boeren hebben in de afgelopen maanden fel geprotesteerd tegen de

Figure 4-12: Manipulations of Experimental Study 3

4.4.2.2. Measures

Manipulation check

In order to assess whether the manipulation had some effect on the intended perception of existing social norms, we asked participants to answer on a 7-point scale (*strongly disagree* to *strongly agree*) whether they agree with statements about norms for behaviours or policy being stronger in their in-group compared to their out-groups. For example, in the case of lab grown meat, we posit that Dutch people are frontrunners of legalising and consuming lab grown meat than people from other countries; Dutch people are more in favour of nuclear power than our neighbouring countries; and people from the Randstad are generally more against the farmers' protests than Dutch people outside of the Randstad.

PhICAM Scale

The 16-item scale of autonomous motivation we developed, which asks participants which considerations play a role in their motivation to support the following policy issues. It features four subscales of different facets of autonomous motivation: Self-Governance (e.g., "[replacing conventional meat consumption with lab grown meat] should be generally accepted as the right thing to do"); Personal Self-Authorship (e.g., "[replacing conventional meat consumption with lab grown meat] is important to who I have become"); Social Self-Authorship (e.g., "[replacing conventional meat consumption with lab grown meat] is a shared ideal between myself and people that I care about"); and Volitional Resolve "[replacing conventional meat consumption with lab grown meat] is what I want to do, more than the alternatives". Items are measured on a 7-point scale from *strongly disagree* to *strongly agree*.

Ambivalence Scale

An 8-item scale developed by Ton and colleagues (2023) of how ambivalent an individual is about a particular topic, e.g., "unless I really have to, I rather not pick a side when it comes to [lab grown meat]". There is also one reverse scored item phrased as "I am sure about [lab grown meat]". Items are measured on a 7-point scale from *strongly disagree* to *strongly agree*.

Policy Agreement

A one-item measure per surveyed topic to ascertain to what extent participants agree with implementing policies to support the topics of the survey as soon as possible. In this case the policies we phrased as: “Fake meat should be allowed as soon as possible to start replacing conventional meat consumption in the Netherlands”; “Nuclear power plants should be built to replace fossils fuels on the short term”; and “Law-breaking protesting farmers should be prosecuted to ensure the implementation of climate related agriculture policies”, each of which were answered on a 7-point scale from *strongly disagree* to *strongly agree*.

Participative Efficacy

Another one-item measure per topic which asks participants to what extent they believe that their own actions will “make a difference” to collective efforts aimed at achieving group goals (van Zomeren et al., 2013). In this case we asked about their perceived participative efficacy for the implementation of policies to allow the sale of lab grown meat, the building of new nuclear power plants, or farmers’ protests, answers on a 7-point scale from *strongly disagree* to *strongly agree*.

Attitude formation

For each behaviour/policy topic, participants were asked to indicate to what extent each of 10 groups of people contribute to their development of attitudes towards the topic. Groups included: family, friends, colleagues, neighbours, society, proponents of the issue, opponents of the issue, other ambivalent people, Dutch people, or Other (with the request to fill in which group this is for the participants). Participants responded on a 7-point scale from *strongly disagree* to *strongly agree* with an option for *not applicable*.

Identification with groups

Similar to attitude formation, in this case participants were asked to report to what extent they identify with other groups in the context of the different topics. The same groups and same answer scale were used as with attitude formation.

Inclusion of Self in Others

We next asked participants to what extent they identified with: people from the Netherlands, people from the *Randstad*, people from outside of the *Randstad*, Germans (for the nuclear power out-group manipulation) and Singaporeans (for the fake meat out-group manipulation). We used the inclusion of self in others measure (Schubert & Otten, 2002), which depicts the individual and the relevant group as two circles at 7 different levels of proximity. They start out not touching one another (low level of identification), get closer together like a Venn diagram, and finally show a full overlap of the circles (high level of identification; see Figure 4.15).

Importance of Environmental Behaviours

As this study is a follow-up from a pilot where we surveyed how ambivalent people were towards certain environmental issues and behaviours, we included one final measure of how important these same behaviours from the pilot are to the participants. These behaviours include: reducing meat consumption; lab grown meat consumption; support for nuclear power; ending Russian gas imports; Extinction Rebellion protests; farmers' protests; increased airline ticket prices; car free city centres; and climate related education in schools. This composite measure will mainly be used to assess how similar the responses are in this survey compared to the pilot and give a general measure of importance of environmental issues, in lieu of a measure like environmental self-identity.

4.4.2.3. Data Analysis

For the confirmatory factor analysis, we perform a multiple group method, like in previous studies. Similarly, we conduct the latent profile analysis (Rosenberg et al., 2019) using the snowRMM package (Seol, 2022) in Jamovi (The Jamovi Project, 2021).

For the manipulation checks, we conduct a simple t-test for the first two behaviours (lab grown meat and nuclear power) to determine whether the manipulation had some effect on the intended perception of the norm. In the case of farmers' protests, the participants were randomly allocated to see a news article portraying people from inside or outside the Randstad as being more in favour of the farmers' protests. As participants' own place of residence would determine whether each of these conditions was seen as an in-group or an outgroup, we have to take this into account as well. As such, we will conduct an ANOVA for the farmers' protests

with both the place of residence of the participant and which condition the participants saw as independent variables. A successful manipulation would show that there is a significant effect in the main effect of the manipulation or in the interaction of manipulation and residence.

For significant manipulation checks, the direct effect of the manipulation on policy agreement will be tested in the same way as the manipulation check.

To answer the hypotheses concerning the mediation effect of autonomous motivation and the moderation effects of identification with the in-group and ambivalence towards the behaviours, we will use structural equation modelling using the Lavaan package in R (Rosseel, 2012). All data analysis is carried out in the latest version of RStudio.

4.4.3. Results

4.4.3.1. Manipulation Checks

The manipulation check for the perceived norm of Dutch support for lab grown meat showed that participants that were shown a positive in-group norm reported higher scores for thinking that Dutch people are leaders in interest in consumption (M=4.165) compared to those that saw an out-group norm (M=2.964). A t-test demonstrated that difference was statistically significant (t(1004.3)=-12.001, p<.001).

Table 4-11: Manipulation Check Lab Grown Meat

Group	Mean
In-group	4.165
Out-group	2.964
t statistic: -12.001, df=1004.3, p < .001	

The manipulation check for nuclear power support among the Dutch was not significant as there was almost no difference in means between those that saw a positive in-group norm (M=3.69) and those who saw that Germans are in favour of switching to more nuclear (M=3.76; t(1011.8)=0.741, *p*=0.459).

Table 4-12: Manipulation Check Nuclear Power

Group	Mean
In-group	3.757
Out-group	3.691
t test: t=0.741, df=1011.8, *p*=.459	

Finally, to check the manipulation for the support of the farmers' protests we conduct an ANOVA to include not just the manipulation but also where respondents are from: within the Randstad or outside of it. As the groups are not perfectly balanced, we use Type-III sum of squares method to run the ANOVA. The manipulation check asks participants to what extent they agree that people from the Randstad are more against the farmers' protests than people from outside the Randstad.

The ANOVA demonstrates that both place of residence inside or outside the Randstad (F(1,1010)=5.701, *p*=0.017) and the manipulation (F(1,1010)=4.315, *p*=0.038) are significant. The interaction effect is not significant (F(1,1010)=0.681, *p*=0.409).

Table 4-13: ANOVA Manipulation Check Farmers' Protests

	Sum-sq	Df	F	P
Intercept	6915.9	1	2505.7729	<.001 ***
Randstad	15.7	1	5.7013	0.017 *
Manipulation	11.9	1	4.3145	0.038 *
Interaction	1.9	1	0.6813	0.409
Residuals	2787.6	1010		

Table 4-14: Means Manipulation Check Farmers' Protests

Residence	Manipulation	n	Mean	SD
Not Randstad	Not Randstad	283	4.943463	1.560932
Not Randstad	Randstad	279	4.65233	1.641718
Randstad	Not Randstad	214	4.584112	1.746876
Randstad	Randstad	238	4.466387	1.720111

Participants that are not from the Randstad view people from the Randstad as more anti-farmers' protests (M=4.80) than participants from the Randstad view themselves (M=4.52). This is in line with the existing norm that people outside of the Randstad tend to support the farmers more, and perceive people from the Randstad as more against the farmers' protests. Furthermore, participants that saw a manipulation featuring a norm that people from outside the Randstad support farmers reported higher agreement with the manipulation check of people from the Randstad being more anti-farmer (M=4.79) than participants that saw a manipulation saying that people from the Randstad support the farmers' protests (M=4.57).

These trends are shown in the interaction plot below (Figure 4-13). People from outside the Randstad (dashed line) report higher agreement with the manipulation check that people from the Randstad are more against the farmers' protests than people from outside the Randstad, compared to people from the Randstad (solid line). The slopes of the lines indicate that participants report higher agreement with the statement 'people from the Randstad are more against the farmer protests' when they have seen a manipulation boasting support for the farmers' protests outside of the Randstad (left) compared to a manipulation boasting support for farmers' protests from people in the Randstad (right).

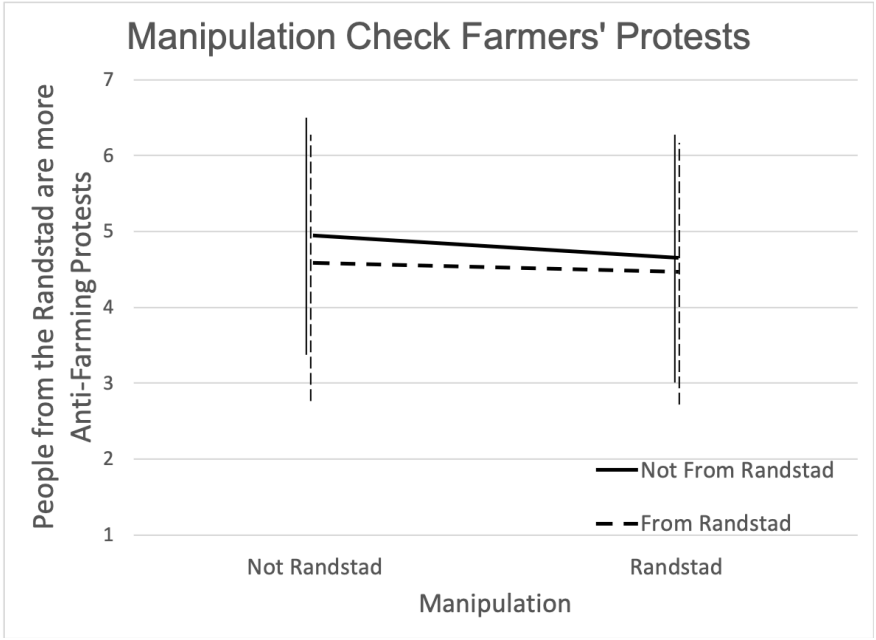


Figure 4-13: Interaction plot of the Manipulation Check for Farmers' Protests

4.4.3.2. Scales

Ambivalence:

As we expected, ambivalence is highest for lab grown meat (M=3.631, sd=1.333), likely because this is the most novel behaviour of the three, followed by nuclear power (M=3.474, sd=1.363) and farmers' protests (M=3.096, sd=1.217). Alphas are acceptable for all three behaviours (between alpha=0.85 and alpha=0.89).

Table 4-15: Ambivalence for Behaviours to be Manipulated

Variables	Mean	s.d.	Median	Skew	Kurtosis	Alpha
Lab Grown Meat	3.524	1.303	3.625	-0.030	-0.355	0.85
Nuclear Power	3.318	1.363	3.625	-0.112	-0.738	0.90
Farmers' Protests	3.080	1.222	3.250	0.028	-0.641	0.85

PhICAM:

The average levels of autonomous motivation range between M=3.030 (for Social Self-Authorship in the case of lab grown meat) and M=4.170 (for Self-Governance when it comes to nuclear power) out of a possible 7. Generally Social Self-Authorship is also the subscale for which participants tend to have the lowest reported scores on autonomous motivation, despite the behaviours having been selected for their higher levels of ambivalence and ambiguity, which we predicted would mean people look to others for guidance on what to believe and what to care about. Contrary to previous research, in this study, Self-Governance was consistently the subscale for which participants reported the highest means of autonomous motivation (in previous studies, this was often Volitional Resolve).

Table 4-16: Means for PhICAM Subscales by Behaviour

		mean	sd	median	skew	kurtosis	Alpha
Lab Grown Meat	Self-Governance	3.528	1.653	3.750	0.003	-0.903	0.94
	Personal Self-Authorship	3.128	1.644	3.250	0.288	-0.897	0.95
	Social Self-Authorship	3.030	1.587	3.000	0.311	-0.894	0.95
	Volitional Resolve	3.300	1.616	3.500	0.112	-0.948	0.94
Nuclear power	Self-Governance	4.170	1.483	4.125	-0.335	-0.237	0.94
	Personal Self-Authorship	3.823	1.457	4.000	-0.089	-0.349	0.94
	Social Self-Authorship	3.764	1.454	4.000	-0.045	-0.330	0.94
	Volitional Resolve	4.058	1.433	4.000	-0.262	-0.109	0.92
Farmers' Protests	Self-Governance	3.724	1.691	4.000	0.018	-0.861	0.96
	Personal Self-Authorship	3.513	1.547	4.000	0.058	-0.547	0.96
	Social Self-Authorship	3.458	1.561	4.000	0.036	-0.607	0.96
	Volitional Resolve	3.687	1.604	4.000	-0.039	-0.594	0.96

Multiple Group Method

Tables 4-17, 4-18 and 4-19 report the Multiple Group Method results for the sampled behaviours, demonstrating that each item has the highest correlation with its own self-corrected subscale, as expected. This table shows the correlations of PhICAM items aggregated across all conditions, but the same results are found when split by manipulation condition. In each case, the internal consistency and reliability is high, well within acceptable ranges (the lowest autocorrected correlation is r=.887, nuclear power, item 14 of Volitional Resolve).

Lab Grown Meat:

Table 4-17: Multiple Group Method Lab Grown Meat

Items	Mean	SD	Self-Governance	Self-Authorship		Volitional Resolve
				Personal	Social	
Self-Governance	3.586	1.605				
Item 1	3.637	1.738	***0.912***	0.754	0.724	0.780
Item 2	3.600	1.738	***0.916***	0.774	0.760	0.816
Item 3	3.342	1.775	***0.905***	0.794	0.795	0.820
Item 4	3.767	1.742	***0.919***	0.762	0.732	0.798
Personal Self-Authorship	3.134	1.597				
Item 5	2.932	1.663	0.710	***0.906***	0.844	0.811
Item 6	3.231	1.755	0.812	***0.927***	0.840	0.882
Item 7	3.310	1.788	0.821	***0.920***	0.832	0.864
Item 8	3.069	1.709	0.772	***0.942***	0.874	0.865
Social Self-Authorship	3.000	1.541				
Item 9	3.008	1.676	0.777	0.835	***0.929***	0.812
Item 10	3.023	1.651	0.764	0.847	***0.918***	0.822
Item 11	2.915	1.688	0.731	0.846	***0.925***	0.813
Item 12	3.056	1.662	0.773	0.859	***0.921***	0.832
Volitional Resolve	3.318	1.589				
Item 13	3.312	1.794	0.798	0.854	0.821	***0.921***
Item 14	3.302	1.740	0.798	0.829	0.802	***0.891***
Item 15	3.226	1.720	0.802	0.841	0.806	***0.907***
Item 16	3.432	1.738	0.800	0.844	0.799	***0.915***

Note: values shown represent the correlations of each item with each of the sub-scales, corrected for autocorrelation. Values in bold indicate which of the sub-scales each of the items correlates with most strongly.

Nuclear Power

Table 4-18: Multiple Group Method Nuclear Power

Items	Mean	SD	Self-Governance	Self-Authorship		Volitional Resolve
				Personal	Social	
Self-Governance	4.174	1.452				
Item 1	4.255	1.554	**0.925**	0.761	0.757	0.835
Item 2	4.238	1.554	**0.909**	0.767	0.768	0.825
Item 3	3.988	1.607	**0.900**	0.781	0.758	0.793
Item 4	4.214	1.570	**0.915**	0.770	0.753	0.825
Personal Self-Authorship	3.826	1.452				
Item 5	3.627	1.605	0.702	**0.897**	0.803	0.767
Item 6	3.927	1.601	0.793	**0.905**	0.785	0.838
Item 7	3.962	1.597	0.799	**0.904**	0.804	0.838
Item 8	3.789	1.616	0.760	**0.914**	0.825	0.807
Social Self-Authorship	3.753	1.440				
Item 9	3.746	1.580	0.745	0.781	**0.905**	0.775
Item 10	3.812	1.558	0.775	0.803	**0.898**	0.801
Item 11	3.691	1.611	0.751	0.817	**0.923**	0.776
Item 12	3.762	1.599	0.748	0.825	**0.904**	0.788
Volitional Resolve	4.060	1.457				
Item 13	3.957	1.632	0.782	0.824	0.793	**0.894**
Item 14	3.963	1.636	0.793	0.826	0.791	**0.887**
Item 15	4.111	1.634	0.811	0.773	0.760	**0.898**
Item 16	4.211	1.595	0.837	0.798	0.757	**0.908**

Note: values shown represent the correlations of each item with each of the sub-scales, corrected for autocorrelation. Values in bold indicate which of the sub-scales each of the items correlates with most strongly.

Farmers' Protests

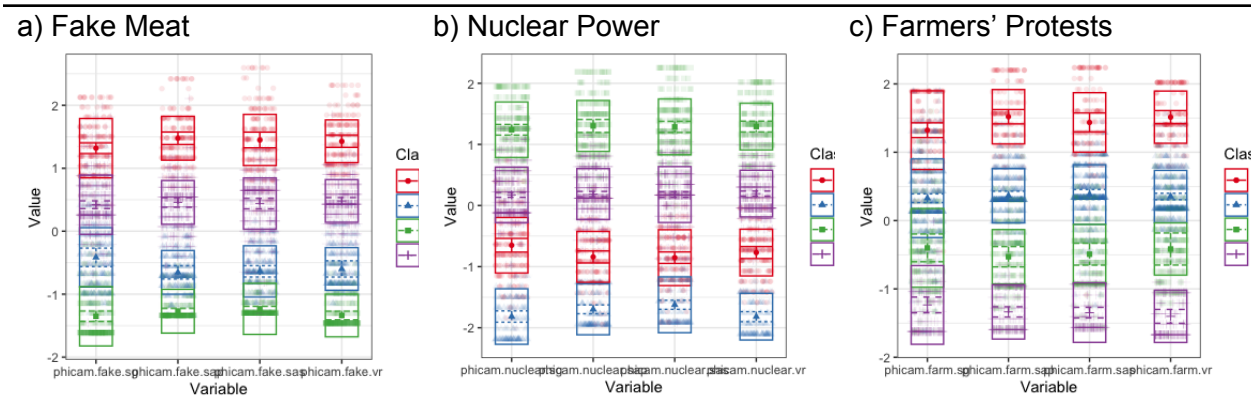
Table 4-19: Multiple Group Method Farmers' Protests

Items	Mean	SD	Self-Governance	Self-Authorship		Volitional Resolve
				Personal	Social	
Self-Governance	3.770	1.707				
Item 1	3.744	1.791	**0.946**	0.729	0.680	0.754
Item 2	3.748	1.791	**0.944**	0.729	0.677	0.747
Item 3	3.879	1.833	**0.937**	0.741	0.692	0.783
Item 4	3.706	1.774	**0.933**	0.775	0.717	0.781
Personal Self-Authorship	3.521	1.580				
Item 5	3.426	1.642	0.712	**0.916**	0.785	0.771
Item 6	3.557	1.704	0.767	**0.943**	0.817	0.831
Item 7	3.572	1.736	0.759	**0.934**	0.832	0.845
Item 8	3.529	1.695	0.711	**0.938**	0.839	0.833
Social Self-Authorship	3.468	1.578				
Item 9	3.500	1.699	0.720	0.836	**0.941**	0.839
Item 10	3.520	1.688	0.687	0.825	**0.944**	0.825
Item 11	3.364	1.648	0.666	0.815	**0.946**	0.815
Item 12	3.490	1.670	0.696	0.829	**0.935**	0.845
Volitional Resolve	3.714	1.625				
Item 13	3.593	1.715	0.743	0.853	0.871	**0.937**
Item 14	3.843	1.795	0.728	0.804	0.784	**0.918**
Item 15	3.658	1.726	0.788	0.822	0.839	**0.948**
Item 16	3.751	1.713	0.788	0.808	0.805	**0.936**

Note: values shown represent the correlations of each item with each of the sub-scales, corrected for autocorrelation. Values in bold indicate which of the sub-scales each of the items correlates with most strongly.

4.4.3.3. Latent Profile Analysis

In the case of each of the behaviours, the profiles that emerge do not differ based on different combinations of more or less important facets of autonomous motivation, but rather, are simply groupings of higher or lower scores across all subscales (Figure 4-14, below). This is a further replication of previous studies that showed no significant differences between latent profiles beyond average strength of autonomous motivation across all subscales.



In each figure, from left to right, the columns represent:
Self-Governance, Personal Self-Authorship, Social Self-Authorship and Volitional Resolve

Figure 4-14: Latent Profile Analyses Experimental Study 3

4.4.3.4. Correlations

There are some differences between the correlation matrices for the different behaviours. Policy agreement is significantly correlated with every other measured variable in the case of lab grown meat, but not for nuclear power or farmers' protests. Identification with the out-group also never correlated significantly with the policy support measure for any of the behaviours, whereas in-group identification always did (as is to be expected). Notably, identification with the in-group only correlates with Self-Governance, for lab grown meat, and only with Self-Governance and Volitional Resolve for nuclear power. For farmers' protests, identification with the Randstad correlates with all facets of autonomous motivation, whereas identification with people outside the Randstad seems unrelated to any form of autonomous motivation. Interestingly, participative efficacy correlates quite strongly with the facets of autonomous motivation for lab grown meat and nuclear power, but not at all for farmers' protests.

Table 4-20: Correlations Fake Meat

	Manip.	Pol. Agr	Efficacy	ID NL	ID Sing	Amb	SG	SAp	SAs
Manipulation Check									
Policy Agreement	0.38***								
Efficacy	0.33***	0.60***							
ID Netherlands	0.01	0.08**	0.04						
ID Singapore	0.06	0.13***	0.08**	0.05					
Ambivalence	-0.02	-0.20***	-0.11***	0.00	0.00				
Self-Governance	0.34***	0.75***	0.52***	0.07*	0.15***	-0.09**			
Self-Authorship (P)	0.29***	0.65***	0.49***	0.05	0.22***	-0.01	0.84***		
Self-Authorship (S)	0.29***	0.62***	0.48***	0.03	0.23***	0.02	0.82***	0.92***	
Volitional Resolve	0.29***	0.70***	0.52***	0.04	0.21***	-0.04	0.88***	0.93***	0.89***

Table 4-21: Correlations Nuclear Power

	Manip.	Pol. Agr	Efficacy	ID NL	ID DE	Amb	SG	SAp	SAs
Manipulation Check									
Policy Agreement	0.27***								
Efficacy	0.24***	0.34***							
ID Netherlands	0.03	0.08**	0.02						
ID Germany	0.01	0.08**	0.13***	0.26***					
Ambivalence	-0.09**	-0.36***	-0.12***	0.02	-0.01				
Self-Governance	0.27***	0.71***	0.35***	0.09**	0.10**	-0.23***			
Self-Authorship (P)	0.29***	0.58***	0.39***	0.07*	0.11***	-0.17***	0.84***		
Self-Authorship (S)	0.28***	0.55***	0.38***	0.06	0.12***	-0.14***	0.83***	0.89***	
Volitional Resolve	0.27***	0.67***	0.39***	0.08*	0.11***	-0.23***	0.90***	0.90***	0.86***

Table 4-22: Correlations Farmers' Protests

	Manip.	Rand.	Pol. Agr	Efficacy	ID RS	ID nRS	Amb	SG	SAp	SAs
Manipulation Check										
Randstad	-0.10***									
Policy Agreement	0.01	0.02								
Efficacy	0.03	-0.09**	-0.25***							
ID Randstad	-0.03	0.27***	0.15***	-0.05						
ID not Randstad	0.03	-0.11***	-0.04	0.05	0.24***					
Ambivalence	-0.07*	-0.01	0.18***	-0.05	0.07*	-0.05				
Self-Governance	0.04	-0.04	0.57***	-0.13***	0.17***	-0.03	0.16***			
Self-Authorship (P)	0.04	-0.01	0.44***	0.00	0.15***	-0.02	0.20***	0.79***		
Self-Authorship (S)	0.02	0.00	0.40***	0.02	0.15***	-0.05	0.21***	0.74***	0.88***	
Volitional Resolve	0.03	-0.02	0.46***	-0.01	0.17***	-0.02	0.18***	0.82***	0.88***	0.88***

Attitude formation

The formation of attitudes and beliefs about different environmental issues may give some indication as to why different behaviours may be more likely to be predicted or influenced by group norms such as those featured in the manipulations. When participants were asked to what extent their attitudes are formed by different groups, *society* and *Dutch people* were reported to be relatively formative/important, despite the means being below the mid-point across the groups for the behaviours. This suggests that people do not report forming their attitudes and opinions through groups, to a great extent.

In the case of lab grown meat, *society* was reported on average to be the most important group from which participants derive their attitudes (M=3.29), only behind 'Other, namely:', in which case participants thought of specific groups that are deemed individually more important (M=3.49). Unfortunately, the participants that filled in anything for this item (n=326, or roughly a third) generally did not specify which group they were thinking of, despite being prompted to do so. Dutch *people* were also reported as relatively important (M=3.21).

For nuclear power, participants' attitudes are also reported to be formed by *society*, the focus of the manipulations (M=3.56), only behind 'Others, namely' (M=3.57), which again was not generally specified by the third of the sample that responded to this item at all (n=333). Dutch people (M=3.43) were also reported as relatively important, but not quite as high as family (M=3.55) and friends (M=3.50).

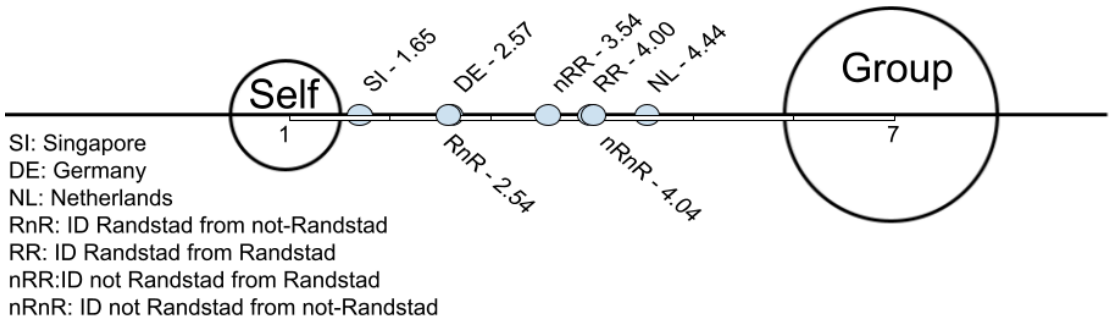
Finally, in the case of farmers' protests, the social group that was reported to most strongly shape the attitudes of respondents was 'Others in favour of the farmers' protests' (M=3.75), followed by family (M=3.71), 'Others, namely' (M=3.69), friends (M=3.69) and finally Society (M=3.62) and Dutch People (M=3.49). This may indicate that participants generally formed their opinion through a clearly non-ambivalent group, and that this may present an issue for the manipulation's success at influencing motivation and policy support.

Table 4-23: Groups that Contribute to Attitude Formation for Behaviours

	Lab Grown Meat			Nuclear Power			Farmers' protests		
	n	Mean	s.d.	n	Mean	s.d.	n	Mean	s.d.
Family	909	3.284	1.925	923	3.554	1.944	932	3.710	1.936
Friends	911	3.223	1.823	925	3.501	1.880	924	3.687	1.890
Colleagues	784	2.935	1.773	789	3.162	1.786	789	3.248	1.852
Neighbours	880	2.541	1.667	889	2.787	1.747	901	2.958	1.820
Society	919	3.293	1.767	941	3.560	1.783	942	3.622	1.783
Others For	913	3.056	1.879	923	3.163	1.796	936	3.746	1.948
Others Against	916	3.171	1.904	921	3.245	1.811	933	3.188	1.823
Others Ambivalent	907	3.031	1.718	908	3.186	1.731	909	3.177	1.721
Dutch People	904	3.213	1.816	930	3.435	1.835	919	3.492	1.839
Other, Namely	326	3.497	1.964	333	3.574	1.994	314	3.691	1.999

Identification with Groups

Participants, on the whole, do not tend to identify very strongly with any of the groups presented. As was to be expected, participants identified least with Singaporeans (M=1.65), the out-group of the lab grown meat condition. This was followed by how much people from outside the Randstad identify with people from the Randstad (M=2.54), which was even less than how much the Dutch participants in our sample on the whole tend to identify with Germans (M=2.47), the outgroup for the nuclear power condition. This goes to show how much of a divide there is between people from inside and outside the Randstad in the Netherlands. Interestingly, people from the Randstad identify quite a lot more with other Dutch people from outside the Randstad (M=3.54) than how much people not from the Randstad identify with Dutch people in the Randstad (M=2.54). Participants reported identifying most with Dutch people in general (M=4.44), even more so than with their respective in-groups; being from the Randstad (M=4.00) or not (M=4.04). This last point suggests that in the case of the Netherlands, national group norms may be more effective than group norm manipulations focusing on sub-groups.



Graphical representation of identification of self with different groups, made to look like the Schubert and Otten (2002) measure of overlap between self and group, just as participants were prompted in the study. Statistics represent average response on a 7-point scale.
The data points about identification with the Randstad and outside the Randstad are split by residence inside and outside the Randstad to create in-group and out-group measures.

Figure 4-15: Identification measure Experimental Study 3

4.4.3.5. Confirmatory Analyses

H1: Policy Agreement by manipulation

On average, participants tend to be most in favour of implementing policies to build new nuclear power plants (M=4.530, SD=1.722) and less in favour of policing farmers' protests (M=3.553, SD=1.992) and legalising and promoting lab grown meat (M=3.554, SD=1.881).

Table 4-24: Policy Agreement Means by Behaviour

Policy Agreement	mean	s.d.	median	skew	kurtosis	se
Lab Grown Meat	3.554	1.881	4.000	0.109	-1.040	0.059
Nuclear Power	4.530	1.722	5.000	-0.380	-0.515	0.054
Farmers' Protests	3.553	1.992	4.000	0.213	-1.117	0.063

The difference between the in-group and out-group policy support for lab grown meat was significant (t(1011)=-2.599, *p*=0.009 **), where the out-group participants on average support legalisation policy less (M=3.400, SD=1.865) than participants that saw the in-group manipulation (M=3.706, SD=1.886). This supports rejecting the null hypothesis for H1.a.

Table 4-25: Policy Agreement Fake Meat

	n	Mean	sd	median	skew	kurtosis	se
Out-group	503	3.400	1.865	4	.228	-0.952	0.083
In-group	510	3.706	1.886	4	-.009	-1.085	0.083
T(1011)= -2.599, *p*=0.009 **							

The difference in policy support for building nuclear power plants was not significant between the out-group (M=4.518, SD=1.768) and the in-group (M=4.542, SD=1.676). As there was no effect of the nuclear energy manipulation on the manipulation check or the dependent variable, we will not continue with subsequent analyses for nuclear power. This suggests no support for rejecting the null hypothesis for H1.b.

Table 4-26: Policy Agreements Nuclear Power

	N	mean	sd	median	skew	kurtosis	se
Out-group	515	4.518	1.768	5	-.337	-.633	0.078
In-group	498	4.542	1.676	5	-.426	-.389	0.075
T(1010)= -0.219, *p*=0.827							

Regarding the policy support to prosecute law-breaking farmers' protesters, Table 4-28 and Figure 4-16 do not support a significant difference between participants from inside and outside the Randstad (F(1,1009)= 457, *p*=.499) nor depending on the manipulation they saw (F(1,1009)=0.076, *p*=.783). This suggests no support for rejecting the null hypothesis for H1.c.

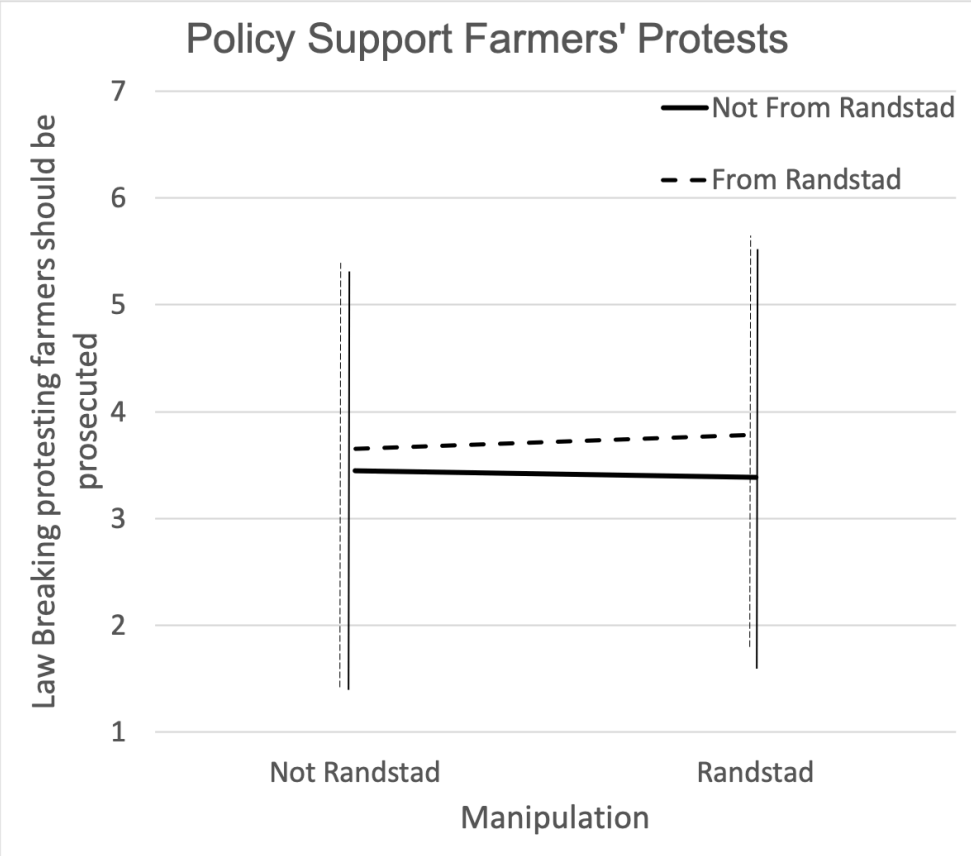


Figure 4-16: Policy Agreement Farmers' Protests Interaction Plot

Table 4-27: Means Policy Agreement Farmers' Protests

From	Manipulation	n	mean	s.d.	median	skew	kurtosis	se
Not Randstad	Not Randstad	283	3.445	1.998	3	0.277	-1.135	0.119
Not Randstad	Randstad	278	3.388	1.973	3	0.312	-1.084	0.118
Randstad	Not Randstad	214	3.654	2.024	4	0.156	-1.134	0.138
Randstad	Randstad	238	3.782	1.962	4	0.078	-1.098	0.127

Table 4-28: ANOVA Policy Agreement Farmers' Protests

	df	Sum Sq	Mean Sq	F value	Sig.
From Randstad	1	2	1.815	0.457	0.499
Manipulation	1	0	0.302	0.076	0.783
Interaction	1	0	0.000	0.000	0.993
Residuals	1009	4012.306	3.977		
F(1,1009)=.076, *p*=.783					

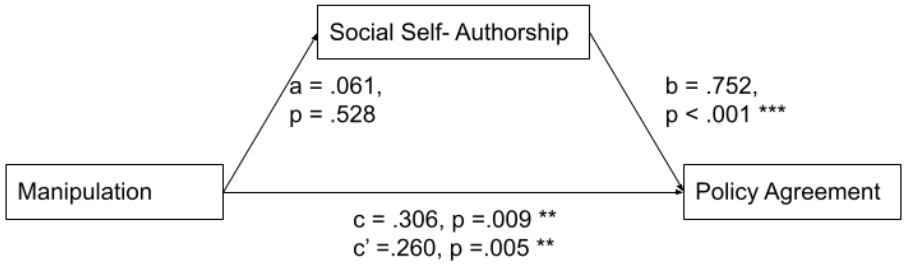
H2: Structural Equation Modelling

To assess the mediation pathways through autonomous motivation, we use Structural Equation Modelling (SEM).

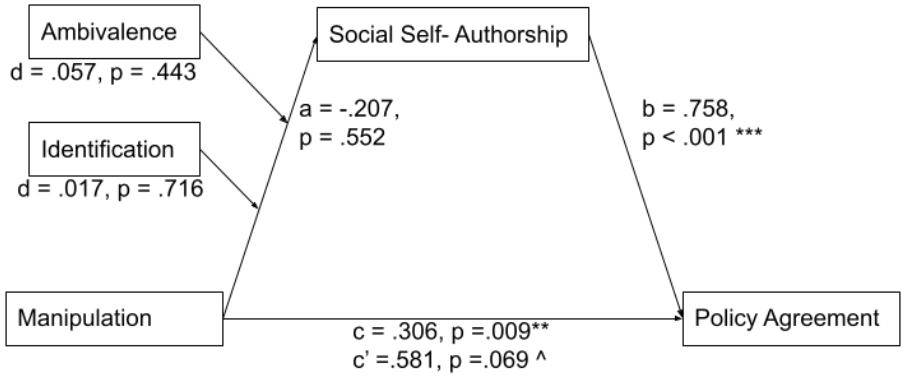
Fake Meat

The simple mediation pathway (shown below) demonstrates that the manipulation of in-group or out-group does not, by itself predict Social Self-Authorship for lab grown meat (a=.061, *p*=.528; hypothesis 2.a). Social Self-Authorship does, however, predict policy agreement (b=.752, p<.001; hypothesis 3.a). This results in a non-significant indirect mediation effect (M=.046, *p*=.528; hypothesis 4.a). The direct effect is still significant (c'=.260, *p*=.005; hypothesis 1.a), so we cannot say that the relationship between the manipulation and policy agreement is mediated through Social Self-Authorship. The model is significant (MTBM(3)=493.815, p<.001).

When the moderators (identification with the in-group and ambivalence towards lab grown meat) are added, the model does not change very much, as both moderators are not significant (hypothesis 7.a & 8.a). Given the additional predictors, the relationship between manipulation and Social Self-Authorship becomes negative, but this does not matter as it is still not significant. The model is marginally better, and significant (MTBM(11)=584.105, p<.001).



a) Simple Mediation Model



b) Moderated Mediation Model

Figure 4-17: Mediation Models Lab Grown Meat, Experimental Study 3

Parallel Mediation

When the structural equation models are computed to include parallel mediation (all sub-scales of the PhICAM scale are included), the model is significant (MTBM(15)=6334.074, *p*<.001). Self-Governance seems to be the only subscale that is significantly predicted by the manipulation (a4=.228, *p*=.023). Self-Governance, Volitional Resolve and Social Self-Authorship, in turn, predict policy agreement, but Self-Governance is the strongest predictor (b4=.731, *p*<.001). This suggests that there is significant and full mediation to speak of, as the standardized Self-Governance pathway is significant (SG=0.167, *p*=.023), and the direct effect goes from being significant (c=.049, *p*=.024) to not significant (c'=0.033, *p*=.115).

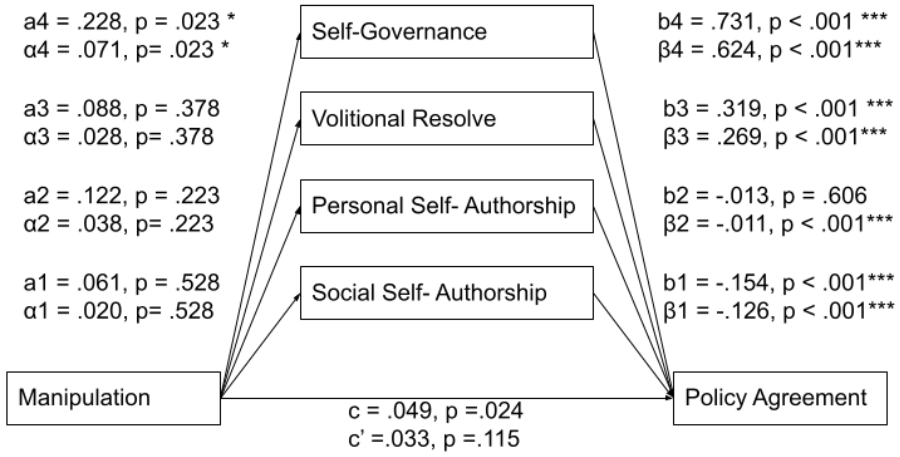


Figure 4-18: Parallel Mediation Lab Grown Meat, Experimental Study 3

Adding Identification and Ambivalence as moderators of Social Self-Authorship (as per our theorising) or Self-Governance (the best mediator according to the parallel mediation model) has no significant effect on the model (H8), and has therefore not been included.

Serial Mediation

Given that only one subscale of autonomous motivation is predicted by the manipulation (Self-Governance), and that this is also the strongest predictor of policy support, there is no added value in a serial mediation, as the strongest relationships are captured in the single mediation pathway. There is thus no evidence in favour of rejecting the null for hypothesis 5.

Nuclear power

Nuclear power will not be modelled with structural equation modelling because neither the manipulation check nor the direct effect of the manipulation on the dependent variable, policy support, were significant.

Farmers' protests

In the case of farmers' protests, there was no significant direct effect of the manipulation on the dependent variable (Table 4-28). The remaining analyses are therefore exploratory and should be interpreted with extra care.

Given that the manipulation check was significant, we tested the relationship between the manipulation and policy support mediated through Social Self-Authorship, and with Randstad as a moderator for completeness (see Figure 4-19*,* below). The model is significant (MTBM(7)=187.557, p<.001) and 16.4% of variance in policy agreement can be explained with the model.

Neither the manipulation (c=.009, p=.782), nor the interaction between the manipulation and participants' residence inside or outside the Randstad (I2=.023, p=.463) were significant predictors of policy agreement. Residence in the Randstad by itself was the only marginally significant predictor (=.055, p=.054) of policy agreement, suggesting people from inside the Randstad are more in favour of pro-environmental/anti-farmer protest policies. There is no evidence in favour of rejecting the null hypotheses for H1.c.

Social Self-Authorship is significantly predicted by the manipulation (M=-.064, p=.042) but is not predicted by residence in the Randstad (R1=.051, p=.106). Social Self-Authorship is also not predicted by the interaction between manipulation and Randstad, which is what would be required for an in-group norm (I1=.003, p=.914; no support for hypothesis H2.c). The negative relationship between the manipulation and Social Self-Authorship indicates that for those participants that saw a manipulation for more pro-farmer sentiment held by people in the Randstad, the less these participants agree that the protesters should be prosecuted based on Social Self-Authorship interpretations of autonomous motivation (i.e., the negative sign is expected for the phrasing of this manipulation).

Social Self-Authorship is a good predictor of policy agreement for policing farmers' protests (SAs=.398, p<.001, H3.c). The indirect effect of the mediation is not significant (M=-.004, *p*=.858, H4.c).

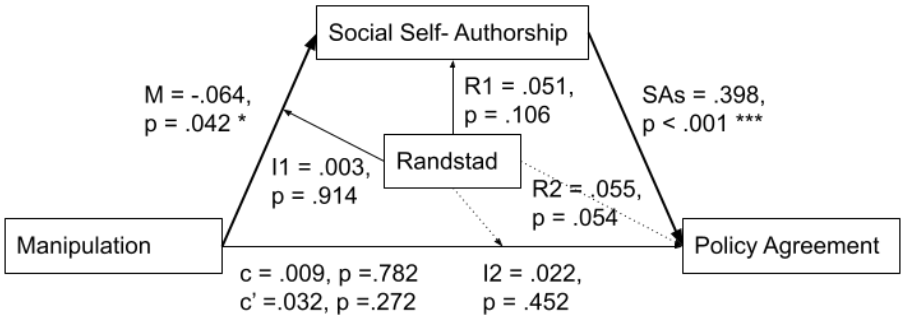


Figure 4-19: Moderated Mediation Farmers' Protests, Experimental Study 3

We added the other predicted moderators for the farmers' protests to this model, to include Randstad, Ambivalence and Identification. The model improves noticeably (Model test=280.462, p<.001) compared to the model without any moderators, and 18.0% of variance in policy support is explained by the model. Only Ambivalence was a significant moderator of the manipulation on Social Self-Authorship (Amb*Manip=.088, *p*=.004). Neither being from the Randstad, nor identification with the Randstad seem to be significant moderators (R=.019, *p*=.562; and ID=-.021, *p*=.513 respectively). The main takeaway from this model is that participants with greater ambivalence towards the farmers' protests will adjust their autonomous motivation based on group norms to be more accepting of farmers' protests. This supports hypothesis 7.c, but no such effect is found for identification in support of hypothesis 8.c.

Parallel Mediation

The parallel mediation model with all PhICAM subscales as mediation pathways (Figure 4-20, below) is significant (MTBM= 4454.521, p<.001; RMSEA=0.856, *p*<.001). Both Social Self-Authorship (a1=-.062, *p*=.048) and Volitional Resolve (a3=-.067, *p*=.032) are significantly predicted by the manipulation. Both Social Self-Authorship (b1=-.062, *p*=.016) and Self-Governance (b4=.603, *p*=<.001) predict policy agreement, but Self-Governance is a considerably stronger predictor. This demonstrates that only Social Self-Authorship is both predicted by the manipulation and a predictor of policy agreement. Nonetheless, this is not a significant pathway by itself (SAs=.004, *p*=.126).

Given that the strongest predicted subscale of PhICAM by the manipulation is Volitional Resolve, and the strongest predictor of policy agreement is Self-Governance, there is a chance that serial mediation featuring Volitional Resolve or Self-Governance might be a significant pathway.

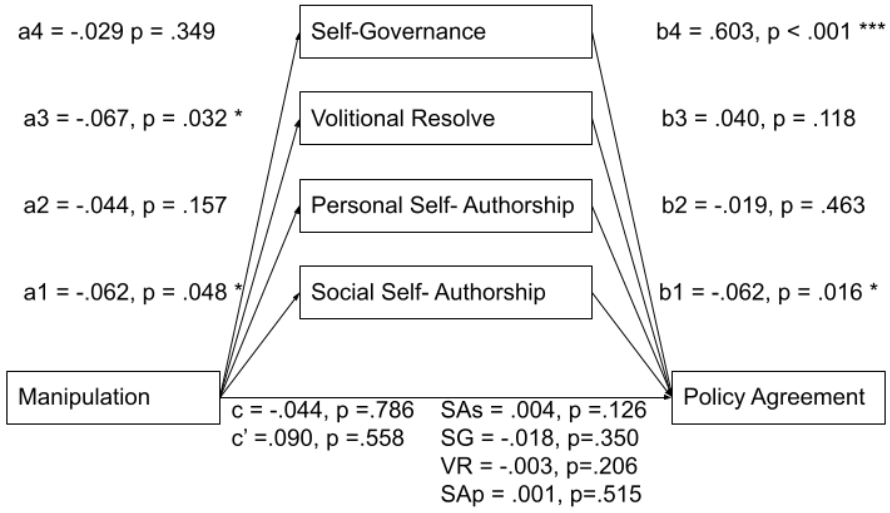


Figure 4-20: Parallel Mediation Farmers' Protests, Experimental Study 3

Serial Mediation

We test three models for serial mediation. The first model features the pathway from manipulation through Social Self-Authorship and Volitional Resolve to policy support, to test hypothesis 5.c. The second is with Social Self-Authorship and Self-Governance (a combination

of our pre-registered theorising and impromptu theorising based on the parallel mediation results) and the final is with Volitional Resolve and Self-Governance (based purely on the strongest parallel mediations).

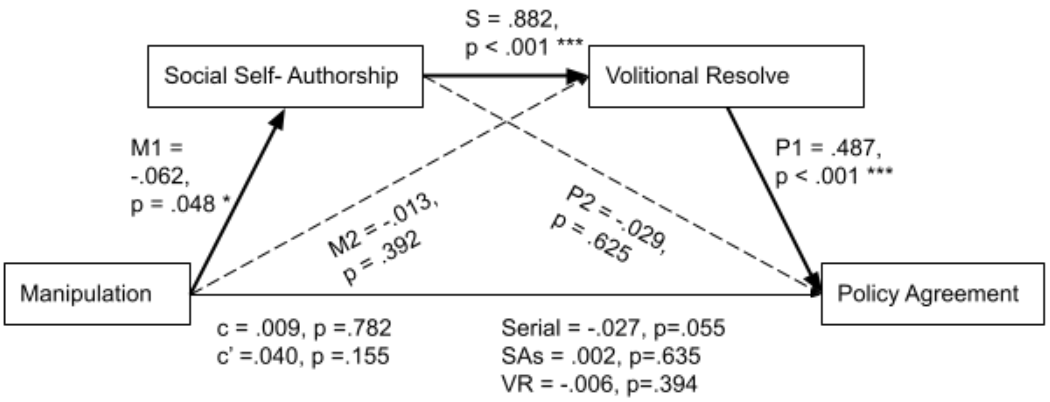


Figure 4-21: Serial Mediation Famers' Protests: Social Self-Authorship and Volitional Resolve

Serial mediation model 1 (Figure 4-21, above), featuring Social Self-Authorship and Volitional Resolve, is significant (MTUM(6)=1779.392, *p*<.001). It demonstrates significant relationships between the manipulation and Social Self-Authorship (M1=-.062, *p*=.048), Social Self-Authorship and Volitional Resolve (S=.882, p<.001), as well as Volitional Resolve and policy acceptability (P1=.487, p<.001). Nonetheless, the serial mediation is only marginally significant (Serial1=-.027, *p*=.055). There is no support for rejecting the null hypothesis for H5.c. This is likely because there is no significant direct relationship to mediate, but serves as an interesting exercise.

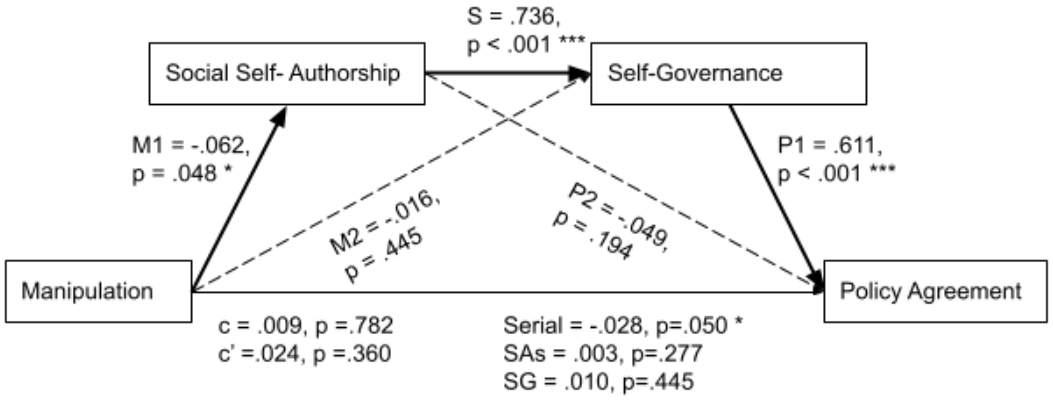


Figure 4-22: Serial Mediation Farmers' Protests – Social Self-Authorship and Self-Governance

Serial mediation model 2, with Social Self-Authorship and Self-Governance (Figure 4-22, above), is significant (MTBM(6)= 1200.915, p<.001). the model demonstrates significant serial mediation (Serial=-.028, *p*=.050). Self-authorship is predicted by the manipulation (M1=-.062, *p*=.048), Self-Governance is predicted by Social Self-Authorship (S=.736, p<.001) and policy agreement is predicted by Self-Governance (P1=.611, p<.001).

Serial mediation model 3, featuring Volitional Resolve and Self-Governance (Figure 4-23, below) is significant (MTBM(6)= 1521.900, p<.001) and also demonstrates significant serial mediation (Serial3=-.033, *p*=.034). Volitional Resolve is predicted by the manipulation (M1=-.067, *p*=.032), Self-Governance is predicted by Volitional Resolve (S=.817, p<.001) and policy agreement is predicted by Self-Governance (P1=.596, p<.001).

Each of the serial mediation models had a significant baseline model, before adjusting for multiplicity of model specification to address inflated Type I errors (Bonferroni correction suggested but not required; Cribbie, 2013). As such, a double serial mediated model will be analysed, but all SEM models are to be interpreted with extra care.

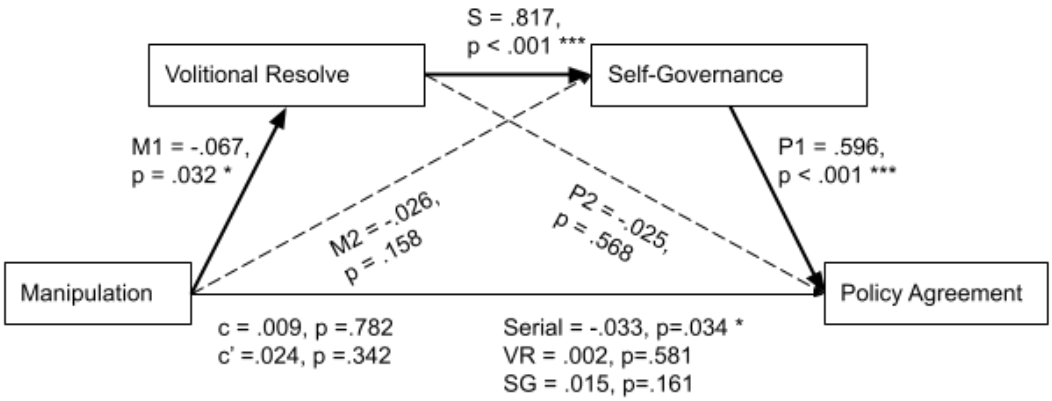


Figure 4-23: Serial Mediation Farmers' Protests – Volitional Resolve and Self-Governance

Finally, we present a model that includes the possibility for double serial mediation (Manipulation → Social Self-authorship → Volitional Resolve → Self-Governance → Policy Support). The baseline model is significant (MTBM(10)= 3059.728, *p*<.001). As Figure 4-23, below, shows, the double serial mediation is not significant (SAsVRSG=-.025, *p*=.052) despite significant individual relationships. This may be due to sample and power issues.

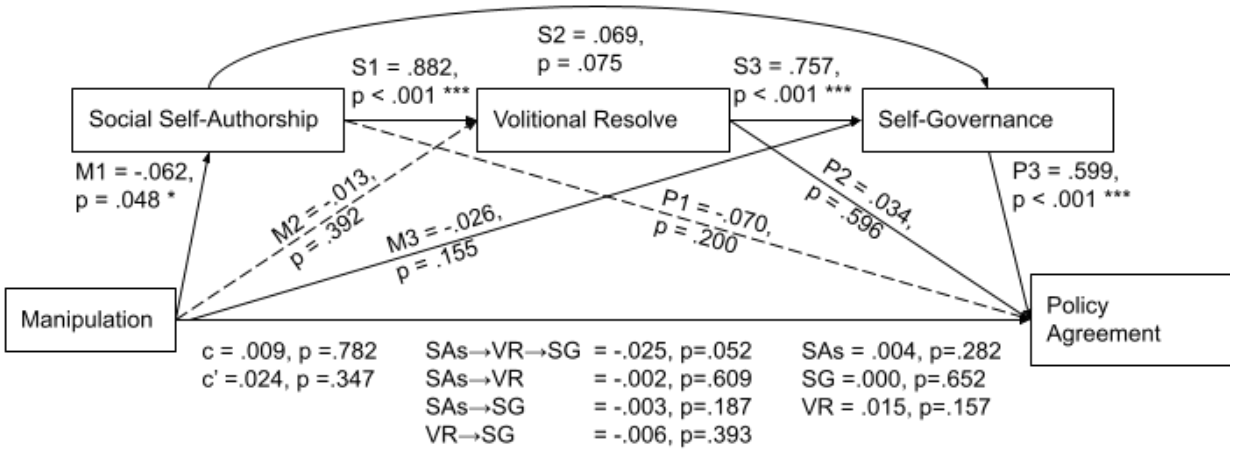


Figure 4-24: Serial Mediation Farmers' Protests – Social Self-Authorship, Volitional Resolve & Self-Governance

4.4.4. Discussion

In this study, we sought to investigate how a group norm about an environmental topic, operationalised through a newspaper clipping, would be internalised differently depending on whether an in-group norm or an out-group norm was presented. The results of this study present reasonable evidence to suggest that in-group norms can be more effective at changing perceived norms, autonomous motivation and policy agreement.

Unfortunately, the manipulation check was not significant in the case of nuclear power, and therefore we were unable to perform the rest of the tests as planned. For lab grown meat, however, a manipulation check demonstrated that seeing an in-group norm made participants more likely to consider the Dutch as front runners in the meat innovation industry. In the case of farmers' protests, the manipulation made participants more in favour of the party that was featured in the manipulation, but this was not stronger when they saw a manipulation for their ingroup.

For lab grown meat, extensive modelling was done to show that the manipulation also led participants to support policies that make lab grown meat more readily available in the Netherlands when a Dutch group norm was presented, supporting H1.a. This result may seem trivial by itself, but this effect was mediated through the Philosophically Informed Conceptualisation of Autonomous Motivation scale, and in particular through Self-Governance. This was somewhat surprising, as our theorising had predicted that Social Self-Authorship would be the best mediator, given that the manipulation had a focus on the in-group's norm. As this was not the case, there was no support for H2.a, the manipulation predicting Social Self-Authorship) and H4.a (mediation through Social Self-Authorship).

Upon reflection, however, it could be argued that it makes sense that Self-Governance is the most relevant sub-scale, as the dependent variable in this study pertains to public policy, which has more to do with how an individual would choose to govern themselves and those in similar positions. Additionally, the manipulation having more of an effect on Self-Governance may be due to the nature of the type of behaviour, as lab grown meat is not yet commercially available in the Netherlands, and we are therefore dealing in more of a hypothetical, which might be more relevant for hypothetical generalisations of how one ought to behave (as Self-Governance may be experienced).

In the case of farmers' protests, the manipulation check showed that, although the manipulation itself was a significant predictor of the check, the expected interaction effect between whether participants are from the Randstad and the manipulation was not significant, so there is no evidence in favour of hypothesis H1.c. This means that although seeing a different manipulation has an effect, whether participants saw an in-group or out-group manipulation had no effect. This suggests that normative behaviour or convictions may shape opinions and beliefs, even when these are not coming from their in-group. Additionally, the identification measure demonstrated that the participants identified more with Dutch people in general than their respective in-groups based on where in the Netherlands they are from. This points to a superordinate in-group effect as in the first experimental study of this chapter (see Amiot et al., 2017).

Nonetheless, the mediation analysis suggests that seeing a manipulation that claims people from the Randstad (rather than outside the Randstad) are in favour of farmers' protests generally makes people more likely to internalise this norm and inform their own autonomous motivation (support for H3.c and H4.c). This is to say that seeing a manipulation of a newspaper clipping that suggests people from the Randstad are more in favour of farmers' protests makes people more likely to internalise this norm and be less in favour of prosecuting farmers that acted illegally during protests. We propose that when participants see that people from the Randstad are supportive of the farmers' protests, this indicates to participants that there is no need to be against the farmers (and their protest), as even the strongest opposition is in favour.

The theorised serial mediation (through Social Self-Authorship and Volitional Resolve) was only marginally significant as a pathway, with each individual relationship being significant. This supports hypothesis 5.c, but this result is somewhat overshadowed by the much stronger and significant serial mediation through Volitional Resolve and Self-Governance. This can be explained as participants reflecting on what issues are truly important to them, and how a manipulation of support for the farmers' protests might make them re-evaluate these priorities. This genuine desire may then translate into how participants think about the issues more morally and would see the issue governed more universally. This is in line with the case of lab grown meat, where we posit that Self-Governance is more likely to be related to public policy acceptability in general, as it pertains to how other people are directed to behave as well.

With hypothesis 6 we predicted the order in which the behaviours rank regarding how well we can predict participants' policy support with the manipulations and mediation through autonomous motivation. We expected that fake meat would be the best predicted, followed by nuclear power, and finally the farmers' protests. While this was the order of the behaviours in terms of participants' reported levels of ambivalence, we found that nuclear power was not predicted at all by the manipulation. This could also indicate that for this sample, the out-group (Germans) was not seen as sufficiently different from the in-group and are seen as a part of a superordinate in-group, as was the case in Study 1. Nonetheless, the identification measure demonstrated that participants identify significantly more with Dutch people than with Germans, and this difference in identification was greater than any of the Randstad related differences in identification. What makes this unsuccessful manipulation more puzzling is the fact that participants, on average, reported society as being the most important of the groups mentioned for attitude formation. Nonetheless, the concerns for superordinate in-group identification may explain the absence of an effect for the farmers' protests. In this case, rather than identifying as any particular subset of the Dutch population, participants may have been more influenced by a norm that presents new or unexpected information, rather than what is considered common knowledge.

In hindsight, it is understandable and even to be expected that Self-Governance is the most important predictor of policy agreement, the outcome variable. The moral and universal nature of public policy makes it all the more reasonable for participants to lean on considerations of Self-Governance to guide their policy acceptance. It is possible that this is particularly pronounced for lab grown meat as there is a rather strong ethical element to the reduction of the livestock sector, as well as the ethical considerations of growing meat in a lab in the first place.

Another explanation for why Self-Governance seems to be the strongest mediator for each of the behaviours is that policy support is a different type of dependent variable than personal behaviour decisions. Public policy agreement was chosen because it seemed more relevant for these behaviours than personal behaviour decisions as it may be harder for participants to anticipate their own behaviour. In the case of lab grown meat, it is not possible to consume the products yet in the Netherlands. In the case of nuclear power, it is very difficult to engage in a nuclear energy related behaviour directly, so voting and collective action (e.g., activism) are usually the only ways to have an impact or a voice. The same is true for most Dutch people in the case of the farmers' protests in the Netherlands. By their very nature, public policies are designed for the entire population so it makes sense that people would regard Self-Governance

as more relevant for policy agreement. Self-Governance is experienced as what is deemed right and wrong, and how an individual would choose to ascribe laws to themselves in such a way that this would be reasonable for everyone.

4.4.4.1. Limitations

In this study we demonstrate a causal link between having been exposed to a newspaper article with a small amendment of a group's norm and see how this affects motivation and public policy acceptability. One obvious limitation of this study is the cross-sectional design of the study itself. Given the one-shot nature of the 2x3 experiment, we cannot say anything about long-term effects of such group norm interventions. A stronger, longer manipulation, such as one where a group's norm is truly experienced, rather a news article, is expected to have much stronger and long-lasting effects.

The fact that a representative sample was used in this study alleviates some of the earlier concerns about sampling issues. Far more extensive research could be done, however, to investigate how people with different backgrounds or associations to particular topics may be differently influenced by such social norm interventions. Although this was attempted to some extent with the binary Randstad as a proxy for likely farmers' affiliation or sympathy, it would be interesting to see how different cultures or Dutch subcultures react to sustainable group norms.

The complexity of the interaction of being from the Randstad was somewhat overlooked in the planning of the study, and measures to account for this were not included every step of the way. For example, there was no item for how people from inside the Randstad or outside the Randstad played a part in attitude formation in the case of farmers' protests. We were therefore not able to study the phenomenon in as much detail as the investigation warranted. Additionally, the complexity of phrasing the farmers' protests in different terms and with respect to different behaviours at different stages of the study also made interpretation more difficult than necessary (e.g., requiring an interaction effect to establish in-group norm).

Additionally, there was also a slight oversight in the design of the manipulations that may have led to spurious results in the case of lab grown meat. When designing the materials, the main difference between the in-group and out-group manipulation was supposed to be establishing a group norm of Dutch people supporting making lab grown meat available for consumption in the

Netherlands or Singaporean people supporting such policies in Singapore. In order to make this seem more legitimate as a news story, a detail was added that lab grown meat was first developed in the Netherlands or in Singapore. This may have led to unintended beliefs about the expertise in developing lab grown meat in the respective countries and influencing policy decisions based on expertise rather than the group norm.

Ambivalence

This study aimed to build on our previous research by adding the insights from research on ambivalence. In line with what Ton and colleagues (2023) found in their research, behaviours for which people have well-formed opinions and attitudes are likely harder to change through an in-group norm manipulation. In contrast, a more specific, novel and controversial behaviour like lab grown meat or supporting the farmers' protests proved to be more appropriate for such societal norm manipulations.

Implications

Despite the limitations of the design, this research shows that it is possible to significantly influence participants' autonomous motivation with a social norm manipulation. Although care should be taken when extrapolating such results to real life situations, the support for hypotheses 1-4 for lab grown meat demonstrate the strength of social norms and how autonomous motivation plays a mediating role to public acceptability. Additionally, the manipulations had similar effects for the case of the farmers' protests. We conclude that there is merit and value to continue such social norm experimentation, especially since the results seem to suggest that autonomous motivation, and Self-Governance in particular, is a consistently good predictor of policy support.

4.5. General Discussion Experimental Studies

In this chapter we conducted three different experimental studies to investigate if and how a manipulation of a social norm can lead to a change in behaviour, or (policy) intentions, specifically by autonomously motivating participants.

In Study 1, we manipulated whether participants saw a commitment campaign that was said to be created by an in-group (psychology students from their own university) or an out-group (psychology students from a different university of applied sciences). The main manipulation was not successful, as it did not lead to any changes in the manipulation check or the other relevant variables. In Study 2, we presented participants with an information campaign about introducing a meat tax in the Netherlands for one of three different reasons (individual health concerns, collective environmental consequences, or a control). Once again, the manipulation was not significant, and the rest of the analysis had to focus on individual differences. Fortunately, many lessons were learned from the first two experiments, and the final study featured a successful manipulation for two of the three behaviours sampled.

The main takeaway from these studies is that when done correctly, the manipulation of a group norm can lead to a significant change in an outcome variable. In the case of the final study of this chapter, the outcome variable that was effectively changed through a social norm was policy agreement. Similar success may have been found with the dependent variables of studies 1 and 2 (signing a commitment to reduce meat consumption and intention to reduce meat consumption, respectively) with a stronger manipulation. The manipulation's effect on the dependent variable has been shown to be mediated through the autonomous motivation scale that we developed.

We theorised that in each of the studies that Social Self-Authorship would be the best mediator between the manipulation and the dependent variable as Social Self-Authorship is theoretically most closely related to social norms and group influence. However, as each of the studies proved, this is not necessarily the case when a social norm is manipulated. In Study 1, the PhICAM subscale that was best predicted by group importance of behaviour was Social Self-Authorship as expected, but Volitional Resolve was the best mediator of the relationship between group importance and intention to sign the commitment.

In Study 2, Personal Self-Authorship was marginally better predicted by importance to reduce meat consumption in general and importance to reduce meat consumption for health reasons. Conversely, Self-Governance was the best predicted subscale by importance to reduce meat consumption for environmental reasons. None of these differences were determined to be significant. Nonetheless, we see that the best mediator was Volitional Resolve as it best predicted intentions to reduce meat consumption.

Finally, Study 3 shows that Self-Governance is the only subscale predicted by the lab grown meat manipulation, and is the only significant mediator, leading to experimental changes in public acceptability of policies. For the farmers' protests, Volitional Resolve and Social Self-Authorship are significantly predicted by the manipulation, while Self-Governance is again the best predictor of policy support, suggesting the need for serial mediation again.

The different subscales of PhICAM are clearly closely related (as per their inter-correlations), and do have quite a lot of theoretical overlap. However, depending on the type of manipulation and the dependent variable (intentions for a common behaviour, signing a commitment, or policy support for a controversial environmental issue) different subscales are going to be more relevant for study and predictive purposes.

In these three experimental studies, the type of design we used is useful to suggest if a social norm intervention can influence outcome variables and how this relationship may be mediated. The manipulations in these studies were one-shot manipulation that were to be read by participants. To know if such group norm manipulations can actually be internalised as autonomous motivation in the long run and affect real world decision making, follow-up studies would be required. In order to establish this, longitudinal designs and field studies could make testing of real behaviours over a period of time more plausible.

Our studies largely support the distinction between Self-Governance, Personal Self-Authorship, Social Self-Authorship and Volitional Resolve as separate facets definitions and understandings of autonomy. This suggests that the distinction may be theoretically important and practically relevant. Furthermore, these insights may be interesting to a broader audience interested in autonomy as such, indicating that the conceptual disagreements in philosophy may be resolved empirically by allowing for each type of autonomy to be a meaningful predictor of behaviour.

Our second hypothesis was confirmed as well. In both studies we found that different subscales of autonomy were predictive of different dependent variables and for different behaviours. Being

able to significantly predict intentions and behaviour with different conceptualisations of autonomy over and above the existing Index of Autonomous Functioning (Weinstein et al., 2012) or the Motivation towards the Environment Scale (Pelletier et al., 1998) indicates the value of a revised scale. In particular, we made a distinction between easy and difficult, or common and less common behaviours. Not only is more variance explained in the models predicting the more difficult behaviours, the types of autonomy that explain the most variance also changes accordingly. As such, for waste disposal and recycling, Self-Governance (Study 1), Personal Self-Authorship (Study 2) and Social Self-Authorship (Study 1 and 2) are important predictors of intentions, whereas for buying sustainable products, Volitional Resolve is consistently more important. We find that Volitional Resolve is the most consistently predictive of actual behaviours. The final study suggests that Self-Governance is particularly relevant for policy related issues (policy acceptability). While Social Self-Authorship is most related to the norms that participants are shown as manipulations, it is rarely the best predictor of behaviour.

Whether the predictive power of different conceptions of autonomy is truly due to the difference in the ease or difficulty, and private or collective action, is something that will be addressed in future research, where different dimensions of behaviour will be surveyed. What is clear, is that experimentally manipulating a group norm can lead to greater internalisation as autonomous motivation in different subscales depending on different reference groups.

5. General Discussion

5.1. The PhD Project

There is now little doubt that human behaviour has an indisputable effect on the environment and, consequently, the climate (IPCC, 2023). Understanding the impact of human behaviour on the environment is therefore a necessary first step to mitigating or even reversing this damage. In an ideal world people would choose to engage in sustainable behaviours and practices voluntarily. This would include behaving accordingly in the absence of any extrinsic cost or benefit from engaging in such behaviour, and without requiring surveillance. That is to say, people do so because they are autonomously motivated. Aside from being better for the environment, there is an added benefit that people are more likely to be able to prosper if they are and feel autonomous in their conduct (SDT; Deci & Ryan, 2000b). Designing environments and policies to encourage behaviour that people freely endorse themselves and thus getting or keeping the population on board with the energy transition, is therefore critical if such change is to be sustainable (Sharpe, 2022).

Forms of motivation are multifarious. Some forms are more long-lasting whereas others are fleeting. For example, some motivation may be based on almost permanent beliefs of morality or long-term goals, whereas other motivation may be desire or context-dependent. Particularly when it comes to environmental issues, many behaviours are particularly effective when they are repeated and become routine (e.g., transport choices, dietary choices, household electricity and water consumption choices, to name a few; Bamberg & Schmidt, 2003; Kurz et al., 2015; Lavelle et al., 2015). In order to become routine when the sustainable option is not the default, it often requires very deliberate initial motivation. Additionally, it is desirable for this motivation to be intrinsic, or rather, autonomous, instead of resulting from more volatile extrinsic motivation, which more subject to self-interest is thus less likely to be sustained (Ryan & Deci, 2000b).

In order to promote autonomously motivated sustainable behaviour, we look to how group norms can be perceived as internal and therefore autonomous due to identity-based processes. Group norms are pervasive in society and often influence us to behave accordingly (Cialdini & Goldstein, 2004). Some of the reasons people look to norms for guidance may be self-serving or self-preserving, like getting normative informational cues or avoiding being ostracised

(Bergquist et al., 2019; Bicchieri, 2017; Cialdini, 2001a; Cialdini & Goldstein, 2004; Thomas et al., 2018). Most importantly for this dissertation, norms can contribute to people's identities if they identify strongly with the group that holds the norm (Spears, 2021). One way that such social influence can be used is through changing the person rather than the behaviour. Rather than make people change their behaviour through compliance (as in Deutsch & Gerard, 1955), which extrinsically motivated and thus often one-off, a group norm can also help shape a person on a deeper level, and inform not just what they do, but what they care about, and how they will choose to behave in future situations as well (Turner, 1991; Spears, 2021).

We approached the question of how norms can be internalised to be experienced as autonomously motivating from the perspectives of philosophy and psychology, and developed a bridge between the two. Although our analyses might be more applicable to psychology in a practical sense (for understanding and explaining behaviour), the insights also contribute to philosophical discourse about what it means to be autonomous, authentically motivated, and more general matters of ethics within political philosophy and governance. In terms of psychology, the contributions of the PhD include, in broad strokes: the theorising and synthesis of novel conceptions of autonomy (largely derived from the philosophy literature; Frankfurt, 1971; Kant, 1785; Raz 1986); a contribution to the theoretical bridge between self-categorisation theory and self-determination theory; a new psychological scale that can be used to measure autonomous motivation; and finally, some more suggestions for processes of internalisation and mediation of motivation to behaviour.

In the remainder of this section of the PhD thesis, we will first discuss the insights from each chapter separately. After this, general conclusions will be drawn from the insights, as well as the general limitations of the research. Next, the lessons learned both for theoretical academic research purposes and for more practical policy applications will be considered. Future research opportunities, both theoretical and applied, will be discussed, before a closing word of final thoughts.

5.2. Discussion of each chapter/study

5.2.1. Conceptual Analysis

In chapter two of the thesis, we explored what it means to be motivated, starting from the perspectives offered by such established theories like self-determination theory (Ryan & Deci, 2000b). We considered what one of self-determination theory's main tenets, autonomy, really means, by analysing its different conceptualisations and operationalisations. Within psychology, despite a common thread between different measures of autonomy, one of the main observations was that not every understanding of autonomy is based on previously developed theory, but they are sometimes developed from an operationalisation of a "lay" understanding of what it means to be autonomous.

By having based our conceptions of autonomy on philosophical conceptualization, this clarified the distinctions in the taxonomy for its use in subsequent empirical (psychological) research. Rather than working based on our own intuition or lay concepts, we drew on the different conceptualisations developed in philosophy (e.g., Frankfurt, 1971; Kant, 1785; Raz, 1986). One of the key insights of the conceptual analysis is the importance of authenticity in autonomy, but that this may have different sources; be they reasons and rationality, comprehensive goals, or desires and volitions.

Additionally, we explored how important other individuals, groups or societies are for different conceptualisations of autonomous motivation, and found that this, too, distinguishes the forms. Although each type of autonomy does allow for some influence of others, self-authorship does this most explicitly, through processes of social learning and the development of comprehensive goals (Raz, 1986). Nonetheless, Self-Governance is based on the self-imposed laws that individuals ascribe to themselves, but these are generally accepted to at least in part be socialised and therefore learned from others and society, rather than innate. Finally, Volitional Resolve does not explicitly describe how social interaction is critical for the formation of desires and particularly higher order desires, but there is also no supposition of its absence. Except for some basic wants (such as food, shelter, and comfort), most desires are also linked in some way to the contextual world around us, meaning that there is a formative role of other individuals and society in our development of these desires and the evaluative nature of preferences and priorities.

Each of these understandings of autonomy comes from a different philosophical tradition, and there are significant differences between them in terms of their roots and consequences. However, for the purpose of psychological study, these conceptions of autonomy can be seen as different subscales of the same overarching construct of autonomous motivation. Although each of the understandings of autonomy can be imagined to be motivating for sustainable behaviour intuitively, the impact of these distinct conceptions is dependent their contributions in empirical research.

5.2.2. Scale Development

In Chapter 3 of the thesis, we cover the process of turning what is predominantly philosophical theorising about a construct into a measure that is usable in psychological empirical research. The development of a scale entails a number of steps: to get from a theoretical concept or construct to a preliminary pool of items, and finally testing and retesting with different samples.

After refining the items after a first round, we arrived at five subscales of autonomous motivation, where one of these was a non-autonomous or extrinsic motivation subscale meant as a contrast to the autonomous counterparts: Self-Governance, Personal Self-Authorship, Social Self-Authorship and Volitional Resolve. We decided to drop this non-autonomous measure in subsequent iterations of the scale and focused instead on the essence of how the differences in philosophical interpretations could be experienced in real life situations. This then brought us to a second iteration of the scale, which worked much better according to the confirmatory factor analyses among different samples.

The scale was subsequently adapted for specific behaviours and in-groups, as well as being translated into Dutch for three studies (Chapter 3, Study 3 and Chapter 4, Studies 2 and 3). After the second iteration of the scale, the items remained mostly the same, as the items were representative of the conceptual nuances of the theories, and because the desired level of reliability of the scale had been established. These results were then replicated in subsequent studies across different sustainable behaviours. These studies included an online United States sample (n=172), a University of Groningen psychology student sample (n=245) and an Utrecht University sociology student sample (n=222).

In addition to wanting to develop a usable and reliable scale of autonomous motivation, we also aimed to learn about the differences between different people in terms of what autonomously motivates them, and how the different subscales may be more important to different people (latent profile analysis), or for different behaviours. When we compare all data across the studies included in the scale development chapter, we find that the emergent groups, or profiles, are predominantly different in degree, not in kind. Overall, then, this offers no conclusive evidence in favour of the existence of different dominant autonomous motivation orientations.

Rather than having certain groups of people relating more to Volitional Resolve, and others identifying with autonomous motivation informed by Self-Governance, we find that people generally report slightly higher levels of autonomous motivation through Self-Governance, and least through Social Self-Authorship (with Personal Self-Authorship and Volitional Resolve close together in the middle). Nonetheless, in each of the first three studies, we find that there is a group of people where one subscale is significantly lower than the other autonomous motivation subscales for a particular behaviour.

In the first study (mTurk, n=172), there was a group for whom Social Self-Authorship was significantly lower than the other PhICAM subscale (for waste separation and recycling this profile made up 30.8% of the sample; for buying sustainably this profile made up 14.0% of the sample). In the second study, with Groningen University psychology students (n=245), Social Self-Authorship was again significantly lower than the other subscales for one profile in the case of reducing water consumption (profile made up 3.3% of the sample). Finally, in the third study (University of Utrecht sociology students, n=222), Self-Governance is significantly lower than the other subscales (this profile makes up 14.8% of the sample).

In the first study, this difference in the trend may have been due to the phrasing of Social Self-Authorship, which was less clear before the items were amended and finalised in the second study. In the third study, the participants were asked about their autonomous motivation for environmental or sustainable behaviours in general (rather than for a specific type of behaviour, as in the other two studies) but nonetheless some of the sociology students did not identify morally influenced autonomous motivation as important. This suggests that there may be specific groups for which there are specific forms of autonomous motivation that they do not identify with for particular (types of) behaviours.

Aside from the latent profile analyses and the confirmatory factor analyses (or multiple group method, as was used instead for a number of studies), these scale development studies also tested other facets of the scale's validity, including the discriminant and convergent validity of the autonomous motivation scale. We compared the PhICAM scale to other autonomy scales (IAF; Weinstein et al., 2012) and contrasted it with other often cited scales in environmental psychology research such as values (Stern et al., 1998) and the Motivation Towards the Environment Scale (Pelletier, Nortel, et al., 1998). Observing discriminant and divergent validity of the PhICAM scale supports the conclusions of contributing to a better understanding of autonomous motivation and a novel measurement tool.

The studies conducted after these three initial scale development studies were not intended merely to replicate the scale's validity, but were intended to test experimental processes. However, some same scale validity metrics (multiple group method, the intuitive alternative to a confirmatory factor analysis) were included in analyses each time, and the scale continued to perform as intended and expected. In summary, the scale has been used 6 times in this PhD project, two of which were collaborations with other researchers (Chapter 3 Study 3 and Chapter 4 Study 2).

5.2.3. Experimental Studies

In the fourth chapter, we discuss three experimental studies. These experiments were conducted after the scale had been sufficiently tested and was deemed reliable across behaviours, populations and languages (Dutch and English). We proceeded to see whether an experimental manipulation could reliably lead to a change in autonomous motivation and subsequent behaviour or related outcome variables. By testing the scale with manipulations of normative messages and frames, it was possible to see how much of someone's autonomous motivation and behaviour could be influenced while maintaining autonomy and free from incentives.

In the first experimental study, we developed petitions asking university students to commit to either eating less meat, or recycling electronic waste. Additionally, the petition was said to be developed either by fellow psychology students at the same university as the participants (University of Groningen) or psychology students from a different university of applied sciences in the same city (Hanze Hogeschool Groningen). This 2 x 2 between-groups experiment

demonstrated that the manipulation check relating to (in-group vs. outgroup) identity was not significant, and (unsurprisingly) neither were subsequent analyses pertaining to the manipulation. This was the first lesson in making the manipulation stronger, with more relevant in-groups and out-groups more clearly defined as such. We did, however, find very interesting results by way of a serial mediation when analysing individual differences across all experimental groups. The manipulation check variable '*group importance of behaviour'*, a measure of identity content, most strongly predicts Social Self-Authorship of the four subscales, which in turn predicts Volitional Resolve, and Volitional Resolve finally predicts behavioural intentions. This serial mediation was significant and suggests that there may be a temporally sequential process of internalisation of group norms in this situation, and potentially in other, similar situations.

In the second experiment, conducted as part of a master thesis, participants (a convenience sample of 213 young Dutch people) were shown a short text stating that a meat tax was going to be introduced in the Netherlands for one of three reasons (informational frames): environmental and sustainability concerns, health concerns or simply as a financial contribution to tax revenues. Additionally, half of the participants were shown a commitment manipulation, asking them to make a commitment to themselves to reduce their meat consumption. Neither the informational frame, nor the commitment manipulations has a significant effect on reducing meat consumption compared to the control. Nonetheless, the internal analysis showed that Volitional Resolve was the best mediating variable of the relationship between importance of environmental and health reasons for reducing meat consumption and intention to reduce meat consumption.

The last experiment showed us that with a stronger manipulation and a larger sample (n=1014) it was actually possible to experimentally manipulate the perceived in-group social norm. In the nationally representative sample, an in-group norm manipulation for lab-grown meat led participants to report higher Self-Governance autonomous motivation and subsequent policy support in favour of legalising lab grown meat in the Netherlands. No such effects were found for Nuclear power, but a similar effect was found for the in-group manipulation of Farmers' protests in the Netherlands. In this study, we surveyed behaviours that participants are likely to be ambivalent towards, and therefore more amenable to adopting a group-norm and experiencing this as autonomously motivating. Although participants' reported ambivalence was not directly related to their level of autonomous motivation for lab grown meat, it was positively

correlated with each of the autonomous motivation subscales for nuclear power and the farmers' protests.

In general, for the experimental studies, we encountered challenges when designing a manipulation to lead to significant manipulations that were experienced as autonomously motivating. In studies with smaller samples and with more homogeneous demographic characteristics, we found that participants tended to have more polarized views on sustainability and this meant that the designed manipulations made too small of an impact to lead to measurable differences between conditions.

In the first study, where we compared psychology students at the University of Groningen to a hypothetical outgroup of psychology students at a different university, we saw relatively little difference between an in-group and out-group norm, presumably as these populations were perceived to be not so different. It is possible that participants perceived to be part of a superordinate in-group that includes all psychology students in Groningen, irrespective of their institutional affiliation.

The focus of the second experiment was to see how a young audience would respond to framing a meat tax, as per the request of the ministry of finance. By focusing exclusively on that demographic, we were unable to compare them to the rest of the population, and therefore we could also not generalise these results to the rest of the population. If we would have sampled from a larger, more heterogeneous population, we may have found significant results of the information frame manipulation, where an environmental frame may have been more motivating for some, and a health manipulation may have been more motivating for others, compared to a financial tax frame that was developed as the control condition.

In the end, the manipulations required a more explicit reference to a social norm, with a very clear and distinct in-group and out-group, to reduce the probability of participants perceiving a common superordinate in-group. A larger and more diverse, representative sample also helped to get more reliable, and externally valid results, as well as have a chance at finding differences between experimental groups as there was more diversity and chance for the manipulation to have an effect.

5.3. General insights

The main aim of this PhD thesis was to determine if and how social norms can have an autonomously motivating effect on individuals to behave sustainably. Although it is important for people to become more sustainable for the sake of the climate crisis, it also remains very important that people feel like they are in control of their actions and behaviour. Moreover, this is more likely to lead to behaviour that is sustained (for longer, and without the need for surveillance). While it seems paradoxical that a group norm can be manipulated and still be experienced as autonomously motivating, our results demonstrate that it is possible, under the right circumstances. The theoretical basis for this endeavour started with a desire to synthesise insights from social identity research (self-categorisation theory; Turner, 1991) and intrinsic motivation research (self-determination theory; Deci & Ryan, 2000b).

In the conceptual analysis we established that autonomy is the concept that is the most central and critical to the understanding of intrinsic motivation that we deem most desirable, which we proceeded to call autonomous motivation. We posited that autonomous motivation provides an important bridge when investigated in combination with norms and social identities (Spears, 2021). Groups can be experienced as part of the self (through group identities), which means that a change in the group can be experienced as an autonomous change in the self. This is why socially influenced autonomous motivation is not actually an oxymoron. If social influence (through social norms, for instance) can be internalised to feel autonomously motivating due to the alignment of social identity, this could lead to increased sustainable behaviour on a larger scale. With individual and group behaviour aligning with individual and group norms of sustainability, this may contribute to desired outcomes on a global level, and all the while maintaining an individual's sense of self. The remaining caveat, then, is that these sustainable behavioural norms need to be prevalent in communities and society to lead to desirable knock-on effects.

Because people are—at least on some level—self-interested, motivating people autonomously rather than through extrinsic factors is also a more effective way to ensure lasting change in behaviour that benefits the environment. This is not to say that people are only self-interested, but if the self is defined at the group and ultimately the human level, there is no conflict between helping oneself and helping others. In that case, it is far more likely that a sustainable behaviour will not be experienced as going against one's self-interest and will therefore be sustained.

5.3.1. Autonomy

Autonomy is widely regarded as a critical element of intrinsic motivation (e.g., Deci & Ryan, 2000b). We are interested in studying and understanding behaviour that is motivated autonomously, but not with a focus on gratification, pleasure or hedonism, as self-determination theory often does (Pelletier et al., 1998). Rather, we consider the internalisation of motivation to be what makes behaviour autonomous and therefore focus on what we call autonomous motivation (rather than intrinsic motivation). For motivation and behaviour to feel like it is because of internalised reasons, rather than any external pressures, it is imperative that behaviour feels self-directed. Autonomy is generally defined in such terms as free from coercion (Dworkin, 2006) and self-directed (Christman & Anderson, 2005; Christman & Christman, 2019), and feels somewhat intuitive, but there are many different ways to understand the concept in the details.

Feinberg (1986) explicitly states that autonomy should not be reduced to a single definition, but rather refers to four related meanings including a capacity to govern, the actual condition of governing the self, the ideal of virtue of self-governing and having the sovereign authority to self-govern. This, critically, encapsulates at its core, “a psychological ability to be self-governing” (Christman & Anderson, 1988, p.109). In our investigation of the concept of autonomy for a fuller understanding to be applied in psychological research, we focus on this psychological ability, and the extent to which participants report feeling like they use that psychological ability to motivate their actions, rather than to what degree they have actual positive and negative liberties and freedoms (Berlin, 2017).

Fundamental assumptions of whether (the experience of) autonomy requires reasoning or desires (or the absence of them) make for theoretically distinct understandings of the concept (cf. Frankfurt, 1971; Kant, 1785). Similarly, autonomy is sometimes (and especially in lay terms) conflated with individuality (Feinberg, 1986) or having to do something in isolation, but rarely required, if even possible. There is a well-developed literature about relational autonomy (cf. Christman, 2004), and in fact multiple different types of autonomy have been identified and distinguished that make explicit that autonomy is not only ever an individual trait or process. This shows that we are not the first to attempt to distinguish a social form of autonomy, or even the first to apply these ideas to social psychology (e.g., Amiot et al., 2011, 2017; Thomas et al., 2017). What makes our approach unique and novel is that we investigate autonomous motivation within a framework that includes different philosophical understandings of autonomy,

with underpinnings of morality, rationality and identity with an explicit integration of self-categorisation theory that was not explicit in the original conception of self-determination theory (cf. self-authorship in Raz, 1986 and Deci & Ryan, 2000b).

There is consensus that autonomy is important, and although autonomy is not to be considered a virtue—“a villain is surely not rendered in any way virtuous by his autonomy”—it is the precursor and a prerequisite for all other virtues (Gillon, 1985, p.1907). Striving for autonomy, however, does not mean that people should value individuality above all else. While it is important to feel authentic and unique, there is ample evidence that people value group memberships (Brewer, 1993). These group memberships may be deemed valuable for the extrinsic benefits that the membership brings (in terms of reduced costs or direct material and social benefits), but also because different group memberships and identities are defining elements of a person, as per self-categorization theory (Turner, 1991). Additionally, social norms are useful for directing behaviour in the absence of sufficient available data, or simply as a heuristic to guide behaviour instead of having to consider all the options (Bicchieri, 2017). Furthermore, such social default options are often seen as the best choice, and sometimes for good reason (Gigerenzer, 2002). As such, people are occasionally willing to be guided and this means that freedom from influence is not the ideal that a narrow reading of autonomy may make it seem. Rather, it may be beneficial to guide people’s behaviour with policies in a way that is beneficial to them, and would be endorsed by others. While this is difficult to always realise in reality, it serves as a useful benchmark of good policy design.

5.3.1.1. PhICAM

In order to test how social influence could be internalised, we developed a scale to capture four distinct conceptualisations of autonomy, which we call the Philosophically Informed Conceptualisation of Autonomous Motivation (PhICAM). The scale consists of four different subscales: Self-Governance, Volitional Resolve, Personal Self-Authorship and Social Self-Authorship. Each of these understandings of autonomous motivation were derived from different philosophical streams/ schools of thought (Kant, Frankfurt and Raz, respectively). The insight that would be considered most informative to the philosophical discourse is whether one understanding of autonomy emerges as the best conceptualisation (in explanatory or predictive terms); or if different contexts reveal different contributions of each of the autonomous motivation subscales. In philosophical discourse, there is no consensus as to what truly

constitutes autonomy and different schools of thought exist. Suffice to say, not only were we able to measure autonomous motivation in respondents, but we found that under different circumstances different types of autonomy were more important.

Self-authorship in general, and Personal Self-Authorship in particular, is perhaps the closest approximation of what is generally understood as autonomy by most people, and in most other formulations of autonomous psychological measures (e.g., the Index of Autonomous Functioning; Weinstein et al., 2012). Nonetheless, this was not consistently found to be the most predictive of behaviours. The subscale could still be used as a rough approximation of what it means to be autonomously motivated, but the fact that other subscales can usually offer additional predictive power underlines the utility of this endeavour by contributing to the autonomy and motivation literature. Social Self-Authorship, the social identity interpretation of Raz's concept of self-authorship, was the result of splitting what Raz (1986) described as self-authorship into a personal dimension focused more on personal growth and self-direction, and a social dimension. This social dimension captures the influence derived from the opportunities afforded by society and the social connections or group identities that shape individuals and groups. This shared or socially derived purpose is what Raz calls comprehensive goal pursuits. When a sustainable behaviour can be compared to alternatives with explicitly lower costs associated with them, people's behaviour (or at least their intentions) are more likely to be predicted by their Volitional Resolve, which focuses on a more evaluative comparison of different desires and electing to act on higher order desires (cf. Frankfurt, 1971). When people are asked to consider sustainable policy decisions, somewhat unsurprisingly, this is correlated more strongly with their Self-Governance autonomous motivation, focusing instead on matters of ought, what they believe is the right thing to do, and how they would choose to self-direct themselves (cf. Kant, 1785).

Although each of the sub-scales of autonomous motivation consistently significantly correlate with one another, they also differ sufficiently to warrant their own subscale and have unique contributions to the understanding of autonomy and motivation. While Self-Governance is the most relevant subscale for predicting highly moralised behaviours, Volitional Resolve is the more relevant subscale when a sacrifice has to be made by moving away from another behaviour that is valued. Personal Self-Authorship is a good approximation for what a single subscale measure could look like and seems to indicate more long-term plans for behaviour. Social Self-Authorship is clearly the most related source of autonomous motivation when a direct reference to a group norm has been made, but may not be enough, alone, to lead to a

change in behaviour. In order for a group norm to be experienced as social self-authorship, this requires both a high level of identification with the relevant group and the norm should be meaningful to the group (i.e. high group importance of behaviour; Milovanovic, 2020). Additionally, there should not be a superordinate in-group that diminishes the in-group norm.

The fact that in multiple studies we find serial mediation to be the best model for predicting behaviour suggests that people may (subconsciously) make the link between different subscales of autonomous motivation in their mind before acting accordingly. For a norm to lead to autonomously motivated behaviour requires multiple steps internal processing.

5.3.2. Internalisation

Internalisation is the process of making an identity, norm or behaviour that is initially experienced as external to oneself (and even imposed), one's own through an alignment between the external party and the individual (Amiot et al., 2017). This process could be the result of someone becoming convinced that a behaviour (that was previously exhibited only for the material or otherwise extrinsic reasons) actually has an intrinsic value to the individual and aligns with how they want to behave in the absence of extrinsic rewards. Alternatively, a group may hold certain beliefs, which are alien to an individual to start with, and only after engaging with the group for a while, through socialisation and adopting a social identity, the reasons and sentiments associated with a topic or related behaviour may become one's own. For internalisation to take place, previous research has pointed out that it is generally necessary for an individual to identify with the group that holds these beliefs for the norms or attitudes to be made one's own (for a review, see Spears, 2021).

Internalisation is a central tenet of the process by which social identities go from being experienced as foreign and imposed to becoming a meaningful part of the self. Additionally, internalisation is an explicit element for the subscale of Social Self-Authorship. Participants were asked to what extent they are motivated to engage in a behaviour because people with a shared identity value the behaviour. This is what we demonstrated with varying levels of success in our experimental studies, where we manipulated norms as coming from in-groups and out-groups. Some of the out-groups we used to make participants feel distanced from others it transpired were too similar to their (relevant) in-group, and were therefore also experienced as similar to themselves (e.g., through a superordinate in-group, as described in Amiot, 2017). In Study 1 of

the experimental studies, the sampled university of Groningen psychology students were presented with an out-group norm as coming from the psychology students from the Hanze University of Applied Sciences, which may have been seen as too similar (e.g., part of a more inclusive student in-group) to have the intended effects of an out-group manipulation. In that case, we were not able to distinguish between these experimental groups empirically. This unintentionally demonstrated the tendency of people to identify with others and see norms of other groups as their own.

5.3.3. SCOOP

This project was designed within the framework of the SCOOP Consortium, and the research contained within it has been conducted with SCOOP principles in mind. In terms of theory, we contribute to the knowledge base of SCOOP by synthesising literature about group identities and personal motivation. We also consider the role of sustainability threats, particularly in the form of spill overs, as one social identity can spill over to another social identity.

Given that groups are composed of multiple individuals, each of whom in turn has their unique combination of social identities, different norms, values and beliefs can permeate and culminate in societal change. A norm can develop in one specific group within a society, and through shared group memberships and overlapping social identities, a norm may transfer to a different group (Curtius et al., 2018). If sustainability norms exist in some peripheral groups, and these are sufficiently internalised by group members, these norms can be *exported* to other groups as new norms. Especially when more specific norms (e.g., curtailing meat consumptions in favour of vegetarian options, or even lab' grown meat) are fostered and transmitted within smaller social groups, these can transfer to adjacent groups, or become more salient in a superordinate group (from the periphery to the mainstream; Nyborg et al., 2016). We have demonstrated that this process may be sustainable in the sense that internalising normative judgments can be experienced as autonomously motivating, and therefore lead to temporally stable behaviour change. We should acknowledge that, although the results of the last study are very promising, there is no longitudinal evidence of this sustained internalised and autonomous change in this dissertation. Further research could test these sustained effects in the longer term (see section 5.6).

As different groups of people have different priorities, there are also different group norms that seem beneficial to different parties; not everyone will agree that a norm held in one group should be held in their own group(s). However, there may be overarching similarities that, despite seeming like they may be in conflict with a group's strongly held norms, may still hold true. To exemplify this, we can imagine a family of farmers that sustain themselves by raising and selling livestock. In the Netherlands, and many other countries, new legislation is being drafted and passed that makes livestock farming more expensive in an effort to dissuade farmers and decrease the number of animals kept as livestock, in order to reduce the resulting emissions. This kind of legislation is, at the level of the individual or the family, an obvious affront to the family's way of life and family business. If a superordinate group were to be made salient to these farmers (e.g., all Dutch people), such mitigation policies may not be seen as imposed from external sources, but by *us as Dutch people*.

5.4. Strengths and Weaknesses

With the unique strengths of philosophy and psychology to complement one another, this PhD provides a valuable combination of conceptual rigour and empirical test and validation associated with these respective disciplines. Nonetheless, in this section, we describe how strengths and weaknesses encountered in this project provide some point for reflection. These main issues can be grouped into design, sampling, and measurement, which will briefly be discussed separately.

5.4.1. Methodology

We started with a conceptual analysis of motivation and autonomy in two different disciplines with vastly different methodologies: psychology and philosophy. We then developed a scale through multiple studies, and continued by experimentally manipulating group norms in order to observe a statistically significant internalisation of group norms to be autonomously motivating.

Due to the multifaceted nature of the design of this project, we opted to focus on developing a conceptual framework and testing the resulting measurement tool extensively. Scale development requires a lot of resources, which were prioritised over conducting field trials. Because we introduce a new measurement tool with the purpose of understanding the process

of internalisation, we focused on conducting experimental studies to establish potential mediation pathways. This process was exacerbated by the difficulty of developing an experimental manipulation of a group norm that adequately distinguished between a perceived in-group and out-group while maintaining the perception of autonomy in the sample. In spite of this, we were able to establish evidence for causal relationships in multiple experiments.

A useful next step would include longitudinal studies to establish the sequential nature of the serial mediation through different PhICAM subscales, and to establish how long the effects of group norm internalisation last., resources were distributed to create a strong foundation for future research to build upon.

5.4.2. Sampling

As all of the studies conducted for this PhD involved active participation and consent, it also meant that people were aware of being observed. This means that we were not able to sample people in their daily lives and made observe of real-world behaviours difficult. Although the participants were blind to the manipulation they saw, there may have been some experimental bias present. Similarly, in some studies, participants were recruited through convenience sampling and may be differently susceptible to experimental effects than participants in a real-world setting.

For the scale development studies, we sampled from convenient populations. Nonetheless, we still sampled from different countries, different universities and in different languages. In the first experimental study, we used a first-year psychology student sample from the University of Groningen. However, student samples may show issues with environmental behavioural sampling (Larson & Kinsey, 2019) due to the left leaning tendencies in student samples (Fryer, 2023). This may have contributed to the observed ceiling effects due to the very high average responses on matters of importance of environmental issues. Similar issues were experienced with the second experimental study that featured a convenience sample approached by the Master student. Fortunately, what these studies may lack in generalisability, they more than made up for in ability to test causality of experimental manipulations. Additionally, in the final study, we used a professional panel service to sample from a nationally representative pool to analyse a sample that represents the Dutch population.

5.4.3. Measurement

The main focus of this research was to establish a new scale for autonomous motivation and suggest causal processes for the internalisation of norms. Notably, survey experiments suffer from self-report bias, both in terms of the responses for autonomous motivation, and participants' intentions and behaviour. Although there is a strong link between intentions and behaviour (Ajzen, 1991) there is still a substantial discrepancy between the two: the intention-behaviour gap. Nonetheless, this may be a blessing in disguise for the purposes of our research, as the required introspection of self-report data may have made it easier to delineate different conceptualisations of autonomous motivation. The more motivated someone is to engage in something for their own reasons (autonomous), the more likely they are to follow through on their intentions.

5.5. General implications

The research conducted as part of this PhD has led to a number of valuable insights. These include lessons that are particularly relevant to the academic fields of philosophy and psychology, and for behaviourally informed policy design.

5.5.1. Contributions to Philosophy

Although the PhD is mainly written from the viewpoint of psychology, there are still some contributions that this thesis makes to philosophy. The conceptual analysis contributes to our understanding of what it means to be autonomous. Although most of the ideas used to develop the theoretical framework of the scale of autonomous motivation are derived from philosophical theories, their application in a number of surveyed settings means that data can now support which of the theories of autonomy most closely relates to what participants perceive to motivate them. While there are potential questions about the distinction between what actually motivates people and what people perceive to motivate themselves, in practice it may be more important to know (and measure, when it comes to actual outcomes) what people perceive and feel. The same argument can be made for the difference between actual autonomy and perceived autonomy.

The predominant insight that is relevant specifically for the philosophical argument is whether there is a measurable difference between the different interpretations of autonomous motivation, and whether one of them is generally a better predictor of behaviour. Because there is limited consensus in the philosophical literature, the empirical data presented here may contribute to the available information to help arbitrate between the various conceptualizations. In general, the results of the latent profile analyses suggest that people tend to report roughly equal levels of each of the subscales of the PhICAM scale, which implies that different people are generally more or less autonomously motivated, but do not tend to be particularly more or less motivated according different philosophical understandings. The main exception to this is that roughly half of the time, Social Self-Authorship is the lowest for each latent group across behaviours and settings. We can speculate that this may be due to the experience of the seeming oxymoron of socially authored autonomous motivation, and therefore responses are lower. While in reality many of our beliefs and values are derived through social interaction (see Kant, 1876 and Raz, 1986), many theories of motivation take the idea of individuality as very closely related to autonomy or authenticity, and this may be experienced as such by our sampled participants. We sampled from the United States (Chapter 3, Study 1) and from the Netherlands (all other studies). It is possible that with their cultural norm of individualism, autonomous motivation at the level of the group may be harder to conceive in these countries. Sampling from collectivist cultures may lead to very different results.

We do not claim to have resolved the debate about what it means to be autonomous, or to what extent this understanding should be based on morality and reason or desires and sentimentality or even whether autonomy presupposes an implicit individuality or sociality. Nonetheless, we do contribute to this debate by suggesting that, at least empirically, each of these conceptions make a significant contribution to understanding the processes of internalisation of group norms.

5.5.2. Contributions to Psychology

The work put forth in this dissertation most directly relates to the field of psychology and contributes to it both theoretically and empirically. A key novel contribution is the development of a new scale, which allows for autonomous motivation to be measured in a new way that taps into the different facets of autonomy derived from our philosophical analysis. This is both a theoretical and a practical innovation.

Theoretically, the implications of this research are significant. We suggest, over the course of three experiments that Social Self-Authorship, the facet of autonomy that is derived through association with others and internalising group norms, and despite the "cultural contradiction" of the group dimension challenging autonomy, can indeed be experienced as authentic and autonomous. This is a significant claim, as this would hitherto be considered external motivation in the majority of self-determination literature. This idea of group-level autonomous motivation supports and builds on theorising by Amiot et al. (2017) who posit that groups can internalise norms for collective motivation. Our findings support the idea that individuals as members of groups can internalise the group's norms and experience these as autonomously motivating. This connects the bodies of literature of self-determination theory (Ryan & Deci, 2000b) and the social identity approach, particularly self-categorisation theory (Turner, 1991). There have been previous attempts to marry these supposedly contradictory or disparate bodies of literature, but to our knowledge none have proposed how different understandings of autonomy may bring these approaches together. This is one of the reasons why we chose to avoid the term intrinsic motivation, in favour of autonomous motivation.

We developed a number of experiments that demonstrated how autonomous motivation works in different contexts. Our models of motivation have shown that although it is difficult to develop an autonomously experienced group norm manipulation in a one-shot online experiment, it is possible to influence behaviour or attitudes. In other experiments, we developed models that show that in fact serial mediation may be the best way to explain how a norm leads to (intentions for) behaviour, with norms directly influencing Social Self-Authorship, followed by Volitional Resolve for personally costly behaviours, and Self-Governance for public policy acceptability.

5.5.3. Contributions to Policy

This thesis focused largely on the theoretical underpinnings of autonomy and motivation. Nonetheless, these concepts, and particularly the lessons learned through experimentation can be used in the future designing of policy applications. Just as the second experimental study on the meat tax was in partnership with the Ministry of Finance, other such governmental bodies could use the insights we developed to develop better, socially informed policies. Far too often, policies are developed with economic or social outcomes in mind that do not sufficiently consider the human aspects of the very people subject to the policies.

Suitable policies would consider not only what outcomes are desirable, but also how to ensure that people are still left feeling supported in their autonomy. The key point for sustainability is that, as long as people are sufficiently autonomously motivated to act, they will not need to be convinced by an external party to do so, or need their behaviour to be reinforced or rewarded by incentives. Therefore, policies should evoke specific or superordinate in-groups to support the internalisation of norms.

While it is important for governments to direct or steer the behaviour of the population, this thesis points to some considerations policymakers may use when designing policies. Although totalitarianism may be effective for achieving outcomes, a socially supported democratic system will allow for sustainable value creation at the societal level (Binder & Lades, 2015; SCOOP, 2020).

5.6. Future research

This research has generated at least as many new questions as it has answers to our original questions. In order to build on the insights uncovered through this research, additional research is warranted.

The first type of future research to cover is follow up research that closely relates to the studies conducted in this dissertation. Future studies could investigate a number of research questions. Building directly on the research from Chapter 4, studies could focus on taxonomizing what kinds of behaviours and groups of people are most and least likely to internalise group norms as autonomously motivating. Given the difference between individualistic and collectivistic cultures, cross cultural research could investigate how cultural differences shape the mental acceptability of social self-authorship (i.e., the perception of an oxymoron of socially influenced autonomous motivation). Furthermore, longitudinal studies could effectively analyse the sequential nature of the measured mediation through autonomous motivation, and say something about how long lasting the effects of an internalised group norm are for motivation and behaviour.

A different avenue where research can quite directly build upon the insights from this project is within the Sustainable Cooperation (SCOOP) consortium. After all, each of the projects in SCOOP are designed to deal with sustainable value creation, involving people at the meso level of analysis of groups, families, communities and organisations. As this was one of the first projects started in the consortium, from the first full cohort, our research contributes to the SCOOP framework as well, and may serve to inspire future projects or collaborations. Similarly, the collaboration between this project and its sister project about “Mobilising households for a sustainable energy transition” has paved the way for more and closer collaborations between projects about similar practical applications or theoretical models. Given the broad applicability and relevance of autonomous motivation beyond the field of sustainability, and the neutral phrasing of the items of the scale, PhICAM could be used to advance the understanding of autonomous motivation for any behaviour in any field.

5.7. Concluding remarks

The behaviour of individuals and groups are contributing to climate change. However, because groups can be experienced as a level of the self, group norms can be internalised to contribute towards autonomously motivated sustainable behaviour. The development of the PhICAM scale has made it possible to measure this process. The studies presented here demonstrate that under specific conditions—like a strong difference in group norms between a high identification in-group and a clear out-group—group norms can be experienced as autonomously motivating. While it seems to be a contradiction that people can be influenced through such norms autonomously, we demonstrate that as long as people agree with the group and see it as part of oneself, social influence may be experienced as in line with one's identity and therefore in line with themselves. Such group norms, when experienced in real life situations may be experienced as even more autonomous than in the experimental settings presented here.

In workplace settings, communities and for the sake of framing public policies, these types of interventions can lead to people making choices that are not only better for the environment, but also in line with their group and in line with what they personally agree with and endorse. Autonomous motivation should therefore be considered more often when aiming to understand behaviour, especially when developing policies that promote sustainability. While it is important for behaviour to be endorsed, in line with goals or higher order volitions, this does not imply that behaviour or motivation is necessarily individualistic. Rather, we present an account of autonomous motivation that suggests that when an individual identifies with a group, its norms can be experienced as their own. Socially influenced autonomous behaviour only seems like a paradox when the group that is doing the influencing is not considered a part of the self.

Nederlandse Samenvatting

Dit proefschrift vormt een uitgebreide verkenning van de ingewikkelde wisselwerking tussen groepsnormen, autonome motivatie en duurzaam gedrag. Het onderzoek is gestructureerd in drie hoofdhoofdstukken, die elk bijdragen aan een genuanceerd begrip van de complexe dynamiek die een rol speelt.

Het conceptuele hoofdstuk, dat de theoretische basis van het proefschrift legt, voegt inzichten uit de filosofie en psychologie samen om een robuuste conceptualisering van autonome motivatie te formuleren. Centraal in deze conceptualisering staat de bewering dat autonomie een cruciale rol speelt bij het in standhouden van gedrag bij afwezigheid van toezicht of stimulans. De gedefinieerde autonome motivatie wordt gepresenteerd als superieur aan intrinsieke motivatie, omdat deze principes integreert uit zowel de zelfdeterminatietheorie als de sociale identiteitsbenadering. Deze voorafgaande integratie maakt het mogelijk om een onderdeel van iemands sociale identiteit te internaliseren waardoor deze als autonoom ervaren wordt. Hierdoor wordt, in tegenstelling tot de zelfdeterminatietheorie, de noodzaak tot het ervaren van genoegen om het gedrag in stand te houden, geëlimineerd. Het hoofdstuk introduceert drie kerncomponenten van autonome motivatie: zelfbestuur (Self-Governance), afgeleid van Kants categorische imperatief; wilsbesluit (Volitional Resolve), geworteld in de hiërarchie van verlangens van Frankfurt; en zelfauteurschap, verder onderverdeeld in persoonlijk zelfauteurschap (Personal Self-Authorship) en sociaal zelfauteurschap (Social Self-Authorship), geïnspireerd door het conceptuele raamwerk van Raz.

Het daaropvolgende hoofdstuk over schaalontwikkeling presenteert een meetinstrument genaamd de Philosophically Informed Conceptualisation of Autonomous Motivation (PhICAM), met 16 items in 4 subschalen. Op basis van een steekproef van 172 deelnemers uit de Verenigde Staten (onderzoek 1), 292 eerstejaars psychologiestudenten van Rijksuniversiteit Groningen (RuG; onderzoek 2) en 222 eerstejaars sociologiestudenten van Universiteit Utrecht (onderzoek 3), blijkt de schaal betrouwbaar en valide in zowel het Engels als het Nederlands. Dit hoofdstuk legt de basis voor experimenteel empirisch onderzoek en bevestigt dat verschillende opvattingen van autonomie, gebaseerd op concurrerend filosofisch discours, elk kunnen bijdragen aan de manier waarop participanten autonome motivatie voor verschillend gedrag ervaren.

Het laatste empirische hoofdstuk, dat zich richt op experimenten, bestaat uit drie afzonderlijke onderzoeken die gericht zijn op het verhelderen van de causale processen die groepsnormen, autonome motivatie en duurzaam gedrag met elkaar verbinden. Studie 1 (met een steekproef van 118 eerstejaars psychologie studenten van de RuG) manipuleert groepsnormen om deelnemers aan te moedigen een petitie te ondertekenen waarin ze zich ertoe verbinden hun vleesconsumptie te verminderen. Studie 2 (met 213 participanten die de onderzoekers via hun sociale netwerk hebben gerekruteerd) maakt gebruik van ingekaderde boodschappen over een vleesbelasting en onderzoekt de impact ervan op autonome motivatie voor vleesconsumptie. Studie 3 is een onderzoek met 1014 participanten representatief voor de Nederlandse bevolking met betrekking tot geslacht, leeftijd, onderwijs en regio. Hier manipuleerden wij groepsnormen met betrekking tot laboratoriumvlees, kernenergie en de boerenprotesten in Nederland sinds 2019, en onderzochten de invloed van deze experimenteel gemanipuleerde normen op de autonome motivatie en aanvaardbaarheid van gerelateerd duurzaam beleid.

De overkoepelende conclusie van het proefschrift onderstreept de cruciale rol van autonomie in besluitvormingsprocessen, waarbij autonome motivatie wordt geïdentificeerd als een belangrijke bemiddelaar in de relatie tussen groepsnormen en duurzaam gedrag. Het onderzoek benadrukt de contextuele nuances die de kracht van deze bemiddeling beïnvloeden, rekening houdend met het soort gedrag, de beschikbare acties en de specifieke groepen waarnaar wordt verwezen in normatieve manipulaties. Afhankelijk van de aard van deze factoren kan een bepaalde subschaal van de PhICAM-schaal relevanter en informatiever zijn over wat mensen autonoom motiveert. Voorts wordt duidelijk of dit gebaseerd is op universaliseerbare redenen, alomvattende doelen of evaluatieve verlangens. Daarnaast suggereert dit onderzoek dat individualisme bepaald niet nodig is om gedrag als autonoom te ervaren. Sociale invloed kan bijdragen aan hoe iemand iets alsnog als autonoom ervaart.

Het integreren van inzichten uit de sociale psychologie en filosofie met interdisciplinaire innovaties wordt essentieel geacht voor het bedenken van strategieën om de klimaatverandering te beperken en duurzame gedragsverandering op zowel individueel als maatschappelijk niveau te stimuleren met behoud van autonomie van de burgers. De resultaten van deze analyse verwijzen naar een complexe rol van autonome motivatie voor het verklaren en voorspellen van duurzaam gedrag. Vaak zijn de attitudes en overtuigingen van een individu gebaseerd op of afgeleid van een ervaren sociale norm of waarneming vanuit de samenleving. Ook al schijnt *sociaal beïnvloedde autonomie* een oxymoron of paradox, hoeft dat vanwege een volledig geïnternaliseerde sociale identiteit niet tegenstrijdig te zijn. Door voort te bouwen op

deze inzichten met vervolgonderzoek kan dit onderzoek een bijdrage leveren aan maatschappelijke vooruitgang, vooral in de context van de energietransitie en beperking van klimaatverandering.

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About the Author

Christopher Robin van Rugge, known as Bob everywhere other than in Groningen, is a Dutch researcher with a broad academic background spanning economics, behavioural science, and, more recently, social psychology and philosophy. Originally from the Netherlands, Bob spent his childhood in Guangzhou, China, and Colombo, Sri Lanka, before completing his secondary education in the Netherlands.

He earned his bachelor’s degree in Mathematics and Economics from Utrecht University, followed by a master’s in Behavioural Science for Management from the University of Stirling in Scotland. During his master's, his research on social norm interventions to promote the use of public bicycle-sharing programs in Stirling sparked his interest in applying research to sustainable practices. Graduating with a Distinction and the Research-Based Learning Prize for the best thesis was the final motivation he needed to pursue a PhD.

Bob went on to complete his PhD at the University of Groningen as part of the SCOOP consortium, where he worked on an interdisciplinary project combining social and environmental psychology with philosophy. This book is the culmination of the project titled *Group-Influenced Autonomous Motivation for Pro-Environmental Behaviour*.

Now based in Dublin, Ireland, Bob lives with his partner, Sarah, and works as a Postdoctoral Researcher at University College Dublin (UCD), focusing on reducing administrative barriers to retrofitting and heat pump adoption.

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This dissertation explores the complex interplay between group norms, autonomous motivation, and sustainable behaviour. It introduces a new conceptualisation of autonomous motivation, integrating insights from Self-Determination Theory and Social Identity Theory to show how autonomous motivation can drive lasting pro-environmental actions, independent of rewards or surveillance.

The work includes the development of the Philosophically Informed Conceptualisation of Autonomous Motivation (PhICAM) scale, a tool designed to measure the different facets of autonomy that influence behaviour. Through three experimental studies, the research examines how group norms shape sustainable choices, from dietary habits to acceptance of environmental policies.

The findings underscore the critical role of autonomy in fostering sustainable behaviour, providing key insights for future interventions and policies aimed at addressing climate change.

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