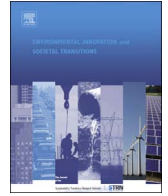




Contents lists available at ScienceDirect

## Environmental Innovation and Societal Transitions

journal homepage: [www.elsevier.com/locate/eist](http://www.elsevier.com/locate/eist)

# The role of psychology in sociotechnical transitions literature: A review and discussion in relation to consumption and technology acceptance

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## ARTICLE INFO

## Keywords:

Agency  
Psychology  
Consumption  
Technology acceptance  
Socio-technical transitions

## ABSTRACT

In the sustainability transitions literature, social phenomena have mostly been examined in relation to – and at the level of – collective forms of action. Here our focus is on psychological, primarily individualistic approaches to understanding action as behaviour, with particular attention to consumption and technology acceptance. We document and discuss the ways in which the psychology of agents or actors has been described and theorised in these contexts within the sociotechnical transitions literature to date, both implicitly and explicitly. A review of the latter literature shows that while actor motivation and behaviour are often implicitly referred to, these are rarely theorised explicitly using psychological concepts. Reasons for the limited use of individual-level, psychological constructs are discussed and suggestions for how these may be more closely connected to structural and collective processes are made.

## 1. Introduction

The *social* is inherent to sociotechnical perspectives. The key assumption of the concept of socio-technical transitions is the co-evolution of society and technology, building upon the more specific interaction of social and technological design choices identified in the social construction of technology (SCOT) tradition (Bijker et al., 1987; Pinch and Bijker, 1984). Technological developments lead to social and broader societal responses, which then affect the further development of technology (Adil and Ko, 2016). This duality is also reflected in frameworks such as the multi-level perspective (MLP; Geels, 2002), where it is argued that transitions come about through different types of interaction between processes at the three levels, via: niche-protected innovations gradually becoming more powerful; landscape-level change that pressures the socio-technical regime; and/or destabilisation of the regime enabling niche-innovations to gain their own momentum (Rip et al., 1995).

From sociological perspectives, transition researchers highlight the role of subjective human experience when, for example, the roles of meanings, interpretation, discourses and symbols are referred to (Stedman, 2016). Yet human experience in transitions processes can also be examined from psychological (particularly social psychological) perspectives (Gazheli et al., 2015). For example, Sarrica et al. (2016) argue for the importance of a ‘human perspective’, using psychological concepts, in understanding energy-related transitions. Again with regard to energy system transition processes in Japan, (McLellan et al., 2016) likewise refer to the role of psychological dimensions, while Adil and Ko (2016) refer to the need to better understand consumption psychology as informing the diffusion of decentralized energy technology technologies.

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<https://doi.org/10.1016/j.eist.2018.01.002>

Received 17 May 2017; Received in revised form 10 January 2018; Accepted 13 January 2018  
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To date, though, while research on energy demand reduction is informed by several different disciplines, with economics and sociology being of particular relevance, social psychological approaches have been, despite their potential to complement the dominant approaches, less influential in informing policy interventions (Sorrell, 2015). Moreover, as we discuss here, they have been little used in earnest in the sociotechnical transitions literature.

We would suggest that it is the emphasis on various forms of collective agency that has led to the socio-technical transitions literature giving less attention to psycho-social processes (see Smith et al., 2005; Hynes 2016). Collective agency expressed through institutions and organisations lends itself to explanatory accounts that involve shared, social processes. Yet accounts of individual-level processes arguably also have much to offer in terms of understanding the behaviour of individuals. We show below that while there are a small number of studies referring to psychological perspectives in the sociotechnical transitions literature, these use a rather limited number of psychological theories and mostly from a functional perspective (i.e. in terms of outcomes), without examining psychological processes themselves in depth (Gazheli et al., 2015; Nye et al., 2010; Stephenson et al., 2015; Whitmarsh 2012).

Our premise is that psychological explanations of various aspects of individual agency have their own intrinsic value – that while there may be sociological analogues or equivalents for understanding particular processes, “ignoring insights from psychological research can handicap progress towards a low-carbon, sustainable future” (Clayton et al., 2015). While sociological or cultural accounts of subjectively-experienced phenomena place their focus external to the individual in terms of processes and emphases, psychology emphasises the characteristics and processes of individuals (micro-level) or group of individuals (meso-level): “sociology generally devote their efforts to identifying *which* social phenomena have effects on individuals while psychologists generally specialize in identifying *the mechanisms or processes through which* social phenomena have their effect on individuals” (Thoits, 1995, p. 1231)?.

Hence while sociological accounts engage with processes experienced by individuals, the origins and nature of those accounts are (by definition) posited as social. Psychology as a discipline offers complementary insights in terms of focus. There are of course deep ontological differences (e.g. regarding the nature of agency: for a more detailed discussion on ontological differences and also points of connection, see e.g. Rivers 1916; Thoits 1995; Shove 2010). Overall, though, we take the view that disciplinary interchange is likely to provide an expanded view of complementary accounts for the understanding of human behaviour in sociotechnical transitions.

With these observations in mind, we firstly conduct a systematic literature review to document and discuss the ways in which the psychology of agents or actors is described and theorized in the socio-technical transitions literature, both implicitly and explicitly. Pre-empting the findings, the literature review shows that the primary use of psychology in the sociotechnical transitions literature has been in relation to consumption and technology acceptance. Of the large variety of perspectives and theories available to psychology, only six main theoretical perspectives have been deployed, of which one, social practice theory, is sociological in origin, albeit with a psychological component relating to habitus and dispositions (Bourdieu, 1986). We show how more use could be made of these six, notwithstanding the greater number of options available.

Secondly, reasons for the lack of integration of psychological theories in other areas of socio-technical transition research are discussed. Of particular importance here is the way in which the systems view of socio-technical research contrasts with the tendency of psychology to focus on the isolated effects of single factors, which in turn relate to the field’s dominant methodological approach, namely forms of experiment (including exploratory attitudinal surveys) that aim at causality testing. Indeed, a justifiable critique of psychological approaches is that by nature they are typically based within individualistic and cognitive paradigms (Keller et al., 2016) and that these fail to adequately take: (a) the influence of the environment into account (Sorrell, 2015); and (b) the influence that individuals may have on that environment (co-construction). Despite these features of dominant psychological approaches, we nonetheless take the view that subjective experience matters for socio-technical accounts and processes; and, therefore, that there is merit in considering how such processes may be better and more closely integrated into structural and collective accounts, including through the use of a broader range of psychological theories than those used so far.

Thus, thirdly, research directions are presented regarding how the use of psychology in transitions might be further developed further, including beyond the sub-fields of consumption and technology acceptance. Based on the findings of the literature review, further theoretical strands for research are elaborated that aim at overcoming the limitations of current dominant psychological approaches. This relates particularly to theories that go beyond the focus on the micro-level of the individual and address the meso-level of social groups, being this e.g. family, community or organizations. For example, identity- and value-related approaches are discussed in detail, as these offer a way to analyze social influences in relation to individual-level factors (e.g. Fielding et al., 2008). Moreover we argue that there is also merit in understanding the psychology of actors other than the public as consumers and citizens, “[t]he elements in socio-technical systems ... [being] maintained, reproduced and changed by various actor groups (e.g. firms and industries, policy makers and politicians, consumers, civil society, engineers and researchers)” Geels’ (2012, p. 417). Although Geels’ comment above refers to different social groups rather than to the individuals of which those groups are comprised, we would nonetheless argue that individual-level psychological processes are no less important.

Finally, in terms of the scope of the paper, it should be noted that here we do not address the equally important matter of exactly how micro-, individual-level processes, whether these are conceived of in psychological or sociological terms, (a) come to be expressed in the systems level, multi-actor processes that sociotechnical transitions theorists posit; or (b) may be studied. For this purpose, one might consider, for example, extended approaches to structuration that include psychological processes through methodological bracketing (Upham et al., 2018). Here, though, we focus on highlighting how psychological processes have implications for transitions processes per se, without elaborating on their translation or conversion to larger scales.

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