

Lecture 02 : Philosophical Issues in Behavioural Science

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Tuesday, 18th January 2022

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1. Introduction

This week we will deepen our understanding of the dual-process theory of instrumental action, examine some evidence supporting it (which will involve becoming familiar with some experimental paradigms), and consider how this theory might complicate attempts to solve The Problem of Action.

Each lecture is linked to an assignment on yyrama. This week's is about Assignment 2, which is also your first piece of assessed work. In this assignment, you are asked how, if at all, discoveries in the behavioural sciences should inform attempts to solve The Problem of Action.

This lecture depends on you having studied some sections from a previous lecture:

- *Instrumental Actions: Goal-Directed and Habitual* in Lecture 01
- *Philosophical Theories of Action* in Lecture 01

For the minimum course of study, consider only these sections:

- *The Minor Puzzle about Habitual Action* (section §2)
- *The Problem of Action meets Habitual Processes* (section §4)

There is quite a lot of material to wrap your head around this week. I've arranged things so that you will be able to do the assignment even if you skip everything next week, allowing you to take more time to study this week's notes and recordings if you wish.

2. The Minor Puzzle about Habitual Action

A rat has been given food contingent on its pressing a lever. When it presses the lever, is its action habitual or instrumental? By the end of this section you should understand why this question is puzzling and also how to resolve the puzzle. You should also understand devaluation, and be able to understand an experiment that provides some of the foundational evidence for the dual-process theory of instrumental action.

I struggled to find a good order for this section and Goal-Directed and Habitual: Some Evidence (section §3). In the end, I put this section first because is most important and much harder. But if already know you are going to study Goal-Directed and Habitual: Some Evidence (section §3) as well as this section, it will probably be easier to do that section first and then return to this one.

You see a rat and a lever. The rat presses the lever occasionally. Now you start rewarding the rat: when it presses the lever it is rewarded with a par-

ticular kind of food. As a consequence, the rat presses the lever more often. This indicates that the rat's lever pressing is an instrumental action, for manipulating the outcome of the action has changed its frequency. But is this lever pressing a habitual action?

In thinking about this question, consider how we characterised habitual and goal-directed processes (in *Instrumental Actions: Goal-Directed and Habitual* in Lecture 01). What does the hypothesis that the rat's lever pressing is dominated by habitual processes predict? And what does the alternative hypothesis that the rat's lever pressing is dominated by goal-directed processes predict?

Because the aim of this section is to get you thinking about the questions, these notes do not answer them. The recording will take you through some considerations.

2.1. The Minor Puzzle

Dickinson (1985) found that when a rat has learned to perform an instrumental action to obtain a food and when the food is devalued, the frequency with which the rat performs the action is reduced but the rat does nevertheless continue to perform the action

1. If the action is habitual, why is it influenced by devaluation at all?
2. If the action not habitual but controlled by goal-directed processes, why does it still occur (albeit less frequently) after devaluation?

2.2. The Dual-Process Theory of Instrumental Action Revisited

As the term 'habitual' is used on this course, *actions* are the wrong kind of thing to be described as habitual. It is the *processes* that trigger and guide actions that can be habitual, not the actions themselves.

This matters because on the dual-process theory of instrumental action, one action may be simultaneously guided by two or more distinct kinds of process, one goal-directed and the other habitual.

The Minor Puzzle is telling us that, in the case of the rat's action, both kinds of processes are influential. The frequency with which the rat performs the action is reduced, indicating that it is influenced by goal-directed processes but the rat does nevertheless continue to perform the action, indicating that it is influenced by habitual processes.

2.3. Conclusion

Actions are controlled by two or more distinct kinds of process, one goal-directed and the other habitual. If an action were very strongly dominated by habitual processes, we might informally label the action 'habitual'. But, as we will further explore in *Goal-Directed and Habitual: Some Evidence* (section §3), the actions of humans, like rats, are often significantly influenced by both kinds of process.

3. Goal-Directed and Habitual: Some Evidence

According to the dual-process theory, instrumental actions can be a consequence of both goal-directed processes and habitual processes. So far we have mainly relied on testimony for this key premise. It's now time to consider evidence for it.

Until *The Minor Puzzle about Habitual Action* (section §2) we had not encountered any evidence at all for the dual-process theory of instrumental action. What evidence supports this theory?

The recording introduces three sources of evidence: > 1. cognitive load (via stress) - Schwabe & Wolf (2010) > 1. representation of contingency - Klossek et al. (2011) > 1. neurophysiology - Dickinson (2016)

If you have difficulty with this (perhaps you are new to psychology, or perhaps you just struggle to follow the lecturer), please consider just the first of these.

It would be much better to have a firm understanding of Schwabe & Wolf (2010) than to have a sense of what each of the three sources of evidence involves.

4. The Problem of Action meets Habitual Processes

Does the fact that habitual processes and not only goal-directed processes influence instrumental actions pose a challenge to the Standard Solution to The Problem of Action? Might this fact even assist us, eventually, in developing a challenge to the Causal Theory of Action?

4.1. Why Focus on The Problem of Action?

What do we want from a philosophical story about action?

We want a framework that supports theorising about action in the behavioural and social sciences. Minimally, the framework should allow us to

make all the important distinctions; enable us to formulate questions about how and why agents act; and support deriving predictions from hypotheses about the answers to these questions. That, at least, is the framework we (well, mainly you¹) are attempting to construct in thinking through philosophical issues in behavioural sciences.

It seems reasonable to expect that any such framework must solve The Problem of Action. After all, the distinction between an action and event that merely happens to you looks fundamental. So while solving this problem is not sufficient for our aims, doing so does seem to be necessary.

4.2. Objection to the Standard Solution

The Problem of Action is to say what distinguishes your actions from things that merely happen to you (see *Philosophical Theories of Action* in Lecture 01).

According to the Standard Solution to this Problem, actions are those events which stand in an appropriate causal relation to an intention (see *Philosophical Theories of Action* in Lecture 01).

What counts as ‘appropriate’ here? This turns out to be a hard problem to answer. Davidson (1980, p.79) noticed, in effect, that intentions can cause events which would not thereby count as intentional actions. We therefore cannot say simply that actions are events caused by intentions; they have to be caused ‘in the appropriate way’, whatever that is.

For our purposes (considering an objection to the Standard Solution), we need not fully specify what counts as ‘appropriate’.² It is enough to notice that, for the causal relation to be appropriate, minimally:

- the action should not manifestly run counter to the agent’s intentions; and
- neither should whether the action occurs be independent of what the agent intends.

Objection to the Standard Solution: some actions are dominated by habitual processes and may therefore manifestly run counter to your intentions. For example, it is possible to continue seeking out a sweet chocolate drink instead of peppermint tea despite being sated on the drink and therefore would actually prefer the peppermint tea (compare Schwabe & Wolf 2010

¹ Your lecturer enjoys the luxury, in teaching, of being able to point to multiple conflicting sources, leaving the hard work of arriving at the truth and discerning the limits of what we know to you. Their role is to introduce and motivate questions, yours to answer them.

² Shepherd (2021, chapter 3) offers a recent attempt.

discussed in *Goal-Directed and Habitual: Some Evidence* (section §3)). Since it is irrational to intend to knowingly seek out a less preferred alternative at no greater cost than seeking a more preferred alternative, it is possible for this action to occur counter to your intentions. Therefore not all actions do stand in an appropriate causal relation to an intention.

Other cases illustrating how habitual processes are insensitive to intentions and can therefore run counter to them about. (Wood & Runger 2016, p. 293) cite two:

1. ‘when students who frequently went to the sports stadium on campus were incidentally exposed to an image of the stadium, they raised their voices as they would habitually in that context, despite no change in their motivation to speak loudly (Neal et al. 2012)’
2. ‘in a study conducted in a local cinema, participants with stronger habits to eat popcorn at the movies consumed more than those with weak habits, even when they disliked the popcorn because it was stale and unpalatable (Neal et al. 2011).’

4.3. First Response to the Objection

In response to the above Objection, consider the possibility of insisting that in every case the agent really does have a guiding intention after all. Could there be a good reply based on this response?

Note that insisting on something contrary to what has been argued is not properly a *reply* to the Objection but merely a *response*. Your challenge is to evaluate whether or not this line of response might be turned into a viable reply.

4.4. Second Response to the Objection

In response to the above Objection, consider restricting both The Problem of Action and the Standard Solution to intentional action.

Could there be a good reply based on this response? It may avoid the Objection, given the further assumption that actions dominated by habitual processes are not intentional actions. But this appears to be a hollow victory. After all, what was supposed to be a bold revelation about action would, if we accepted the reply, turn out to be merely the claim that intentional actions are things that stand in an appropriate causal relation to an intention.

Further, unless we think that all actions are intentional actions (which would

be hard to square with the above Objection), the original Problem of Action is still a good question. We still need to know what distinguishes actions of all kinds from things that merely happen to you.

Are there better replies to the Objection? Or can this response be developed in a much better way? If neither, should we revise or reject the Standard Solution?

We might minimally revise the Standard Solution by saying that actions are those events which stand in an appropriate relation to either a goal-directed process or a habitual process. This quite minor revision allows us to retain the Causal Theory of Action.

But can stimulus-action links and habitual processes really be relevant to solving The Problem of Action?

4.5. Further Replies to the Objection

4.5.1. An Anscombian Perspective

Kalis & Ometto (2021, p. 640ff) provide a critical overview of several philosophers' attempts to reply to a variant of the above Objection. These authors propose their own response, which does involve rejecting the Standard Solution in favour of an Anscombe-inspired alternative.³

If exploring further work by philosophers, be careful to check whether their understanding of habitual process matches yours. You can tell that this will be tricky from the fact that Kalis & Ometto (2021, p. 640ff) write about 'habitual actions', whereas, strictly speaking, no such things exist on the dual-process theory of instrumental action (as explained in *The Minor Puzzle about Habitual Action* (section §2)).

4.5.2. Basic Actions?

A different line of response might be to appeal to so-called basic or primitive actions, that is, actions which you can perform without performing any other action (Davidson 1971).⁴ In cases like popcorn eating where, supposedly, actions can run counter to any intention, consider that there is a distinction between the larger action (eating popcorn) and component actions like reaching for some popcorn, grasping it, transporting it to the mouth and

³ Note that these authors' are presenting a slightly different objection from the one above, as you can see from their diagnosis of how the objection arises (Kalis & Ometto 2021, p. 642). Although they do mention

⁴ As Schlosser (2019, footnote 17) notes, there is no agreement about how to characterise basic actions. This notion should be invoked with caution and avoided where possible.

eating it. Regardless of whether the larger action runs counter to any intention, might these component actions nevertheless be appropriately related to the agents intentions? If so, could we revise the Standard Solution to avoid the Objection above?

Discoveries about motor representation (see *Motor Representation* in Lecture 03) complicate this line of response in two ways—they make it harder to characterise actions like reaching and grasping as basic actions, and they indicate that may be no need to postulate intentions concerning these actions specifically (as they are already well taken care of by motor representations).

4.6. Bonus Dangling Question: Alternative to the Causal Theory?

According to the Causal Theory of Action, an event is action ‘just in case it has a certain sort of psychological cause’ (Bach 1978, p. 361). If we retain the Causal Theory and if we also accept that some actions are dominated by habitual processes and may therefore run counter to your intentions, then we will have to invoke not only beliefs, desires and intentions but also stimulus-action links in distinguishing actions from events that merely happen to you.

This may motivate considering alternatives to the Causal Theory.

Consider two questions:

1. What distinguishes instrumental actions from things which merely happen to an agent (and from noninstrumental actions, if there are any)? [This is ‘The Problem of Action’]
2. Which states cause instrumental actions?

Fully understanding action requires answering both questions (and more).⁵ But the Causal Theory of Action insists on answering the first question in a way that also involves answering, partially or wholly, the second. The idea is not simply that better understanding answers to the second question might guide us in working out the answer to the first question. On the Causal Theory of Action, any answer to the first question must already involve answering the second. There is no possibility, not even in principle, of answering the first question correctly but then discovering that everything we thought we knew about the second question is wrong.

Let us say that any answer to the first question which does not involve making commitments concerning which states, or structures of states, cause in-

⁵ Of course there are philosophers who might deny that the second question bears on any philosophical questions about action (Ginet (1990), for example).

strumental actions is *mechanistically neutral* (as opposed to a *mechanistically committed* answer, which the Causal Theory of Action requires).⁶

If we reject the Causal Theory of Action, we will need a mechanistically neutral solution to The Problem of Action. What might that be?

5. Question Session 02

If available (no promises), recordings of the live whole-class lecture will be here, together with slides and references. They are usually available on the day after the session. (You may need to refresh this page to make them appear.)

This session covers these questions:

- Which things are agents?
- What are intentions?
- Which events are expressions of agency?
- [Barty] How are we to understand the ‘you’ in The Problem of Action?
- [Jan] Was not Davidson in his Essay ‘Agency’ concerned with Agency and therefore Intentional Action that is an expression of Agency rather than action per se?

We discuss James’ examples of action slips and Velleman’s distinction between purposeful activity and autonomous action.

5.1. Consciousness

In responding to the questions, I pose a challenge: we should not make assumptions about the role of consciousness in selecting, preparing and performing actions unless we can justify them. Hommel (2017) demonstrates, in effect, why this challenge is a good one. He argues that

‘conscious experience does not seem to play a role in ongoing action control, [but] is likely to provide the basis for interpersonal learning and cultural transmission.’ (Hommel 2017, p. 120)

⁶ Note that the possibility of characterising A in terms which do not mention B does not in general imply that it is possible for there to be As without corresponding Bs. Proponents of a mechanistically neutral approach may therefore accept that instrumental actions are caused by intentions and could not be caused in some other way .

Glossary

Causal Theory of Action According to this view, an event is action ‘just in case it has a certain sort of psychological cause’ (Bach 1978, p. 361). 4, 7–9

devaluation To *devalue* some food (or video clip, or any other thing) is to reduce its value, for example by allowing the agent to satiate themselves on it or by causing them to associate it with an uncomfortable event such as an electric shock or mild illness. 2, 3

dual-process theory of instrumental action instrumental action ‘is controlled by two dissociable processes: a goal-directed and an habitual process’ (Dickinson 2016, p. 177). 2–4, 7

goal-directed process A process which involves ‘a representation of the causal relationship between the action and outcome and a representation of the current incentive value, or utility, of the outcome’ and which influences an action ‘in a way that rationalizes the action as instrumental for attaining the goal’ (Dickinson 2016, p. 177). 3, 4, 7

habitual process A process underpinning some instrumental actions which obeys *Thorndyke’s Law of Effect*: ‘The presentation of an effective [=rewarding] outcome following an action [...] reinforces a connection between the stimuli present when the action is performed and the action itself so that subsequent presentations of these stimuli elicit the [...] action as a response’ (Dickinson 1994, p.48). 3, 4, 7

instrumental action An action is *instrumental* if it happens in order to bring about an outcome, as when you press a lever in order to obtain food. (In this case, obtaining food is the outcome, lever pressing is the action, and the action is instrumental because it occurs in order to bring it about that you obtain food.)

You may find variations on this definition of *instrumental* in the literature. Dickinson (2016, p. 177) characterises instrumental actions differently: in place of the teleological ‘in order to bring about an outcome’, he stipulates that an instrumental action is one that is ‘controlled by the contingency between’ the action and an outcome. And de Wit & Dickinson (2009, p. 464) stipulate that ‘instrumental actions are *learned*’. 3, 4, 10

mechanistically neutral A characterisation of instrumental action (or of joint action) is *mechanistically neutral* just if it does not involve making

commitments concerning which states, or structures of states, cause instrumental actions (or cause joint actions). 9

motor representation The kind of representation characteristically involved in preparing, performing and monitoring sequences of small-scale actions such as grasping, transporting and placing an object. They represent actual, possible, imagined or observed actions and their effects. 8

Standard Solution (to The Problem of Action). Actions are those events which stand in an appropriate causal relation to an intention. 6–8

The Problem of Action What distinguishes your actions from things that merely happen to you? (According to Frankfurt (1978, p. 157), ‘The problem of action is to explicate the contrast between what an agent does and what merely happens to him.’) 1, 2, 4–7, 9, 11

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