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But what is ‘Performativity of Science’? Austin, Perlocutionary Sequels, and Referent Malleability

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Abstract. Ever since its introduction by John L. Austin, ‘performativity’ has meant many things to many scholars—something that did not change when phrases like ‘performativity of science’ became popular. Such equivocations might have been unproblematic, were it not for their tendency to obscure important debates in philosophy of science. In this paper, I revisit Austin’s original use of the term ‘performativity’ and propose a nomenclature of three kinds of performativity in science. This project revises earlier attempts to classify and identify ‘genuine’ or ‘authentic’ performativity in science and instead advances an integrative disambiguation—one that preserves what scholars in STS and philosophy of science have found helpful about the concept while addressing demonstrable areas of conceptual conflation.

Keywords: Performativity, Reflexivity, Speech Act Theory, STS, Austin

1 Introduction

In philosophy of science, there has been a growing interest in the so-called ‘performativity of science’. Drawing loosely on resources from speech act theory, recent controversies have, for instance, sparked around communication ethics and scientists’ responsibilities that follow from the allegedly performative nature of science when they help induce ‘self-fulfilling prophecies’.¹ Undeniably, however, ever since John L. Austin’s (1962) initial coinage of the term, ‘performativity’ has meant many things to many scholars, and its diverse uses have been notoriously

¹ See van Basshuysen et al. (2021), Winsberg and Harvard (2022), Ortmann and Veit (2023), Khosrowi (2023) and Ortmann (2025).

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ambiguous and obscure.² Little about this changed when philosophers of science and scholar of science and technology studies (STS) adopted the terminology for their purposes in the 1990s. Claims that science is performative (and similar phrases) have, as it stands, meant anything between (i) that scientists perform speech-acts in science communication (Franco 2019; John 2019), (ii) that science can create self-fulfilling and self-defeating prophecies (van Basshuysen et al. 2021), (iii) a mixture of the above (Callon 2007), (iv) that scientists perform social roles akin to theatrical performance (Hilgartner 2000), (v) that scientists causally interact with the phenomena they study when cashing them out as phenomena in the first place (Barad 2003), (vi) that scientists make use of artistic methods or re-enactments (Hendriksen 2020), and more.³ This bouquet is only complemented by the fact that there usually exist overlapping terminologies for each of the above applications; honourable mentions include ‘enactment of science’ (Law and Urry 2004), ‘interactivity’ and ‘looping effects’ (Hacking 1996), ‘reflexivity’ (Buck 1963), and more.

There is, of course, nothing inherently wrong with fuzzy concepts, nor with polysemy, even and especially in science (Haueis 2024). Let things become too fuzzy, however, and it becomes increasingly difficult to discuss the performativity of science and its alleged implications. Along these lines, commentators expressed discontent with the current state of the literature. Uskali Mäki, for instance, casts the various departures from Austin’s original coinage of performativity as ‘impoverished’, being ‘nothing but scientific regress’, and in need of ‘conceptual recuperation’ (2013, 452). Sympathisers of Mäki’s claim would find a lack of conceptual clarity especially worrying given that arguments based on the performative nature of science regularly carry strong implications. The sociologists MacKenzie and Millo (2003, 107), for instance, argued that the performativity of economics would pose ‘the most challenging recent theoretical contribution to economic sociology’. Similarly radical, in philosophy of science, recent controversies have debated whether ‘performativity’ could be regarded as a legitimate modelling purpose in its own right, different from epistemic purposes (van Basshuysen 2023), or the opposite, that this would never be justified and pose a ‘serious threat to democratic decision making’ (Winsberg and Harvard 2022, 515). Regardless of where one stands on these debates, the stakes are evidently high, and they rest on unsettled conceptual foundations (cf. Guala 2007; Mäki 2013). What it means for science to be ‘performative’ thus deserves serious attention.

I begin by tracing selected contributions, starting with a revisit to Austin’s origins and its later applications in philosophy of science. The notions of ‘performativity’ at play in philosophy of science suffer from ambiguities that, as it turns out, have already been put in place by Austin himself as part of his original

² Butler ([1990] 2007, Preface (1999)) granted that it is ‘difficult to say precisely what performativity is’; Culler (2007, 138) called it ‘scarcely clear’, Guala (2016a, 30) ‘not a well-defined object’, and Mäki (2013, 444) ‘unclear’.

³ References here are examples and not necessarily representative of a shared view of what ‘performativity of science’ is.

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argumentative strategy. The typology I propose is threefold. ‘Generic’ performativity in science occurs when a locutionary act, such as a scientist’s assertion, is performed and has any perlocutionary downstream effects at all. More narrowly, ‘reflexive’ performativity occurs when perlocutionary effects or sequels specifically affect the locution’s referent or target system and in a way that bears on the locution’s veracity (e.g. it becomes false or true, increases or decreases model-target fit, etc.). Lastly, the third category, ‘constitutive’ performativity, occurs when a locutionary act constitutes its own locutionary referent. Individually, this latter class is likely not of much relevance to philosophers of science, but it accommodates types of speech acts familiar to scholars of speech act theory. Spelling it out helps elucidate the relationship between speech act theory and what scholars in sociology and philosophy of science have meant by ‘performativity of science’: because the proposed typology is primarily contingent on the nature of *perlocutionary* effects, it runs orthogonal to typologies of *illocutionary* speech acts, such as John Searle’s.

I proceed as follows. Section 2 covers Austin’s move of collapsing his initial distinction between constatives and performatives. Section 3 debates a departure from Austin by sociologists of economics and scholars of STS that has proven influential among economists and philosophers of science. In response to conceptual shortcomings identified here, I develop the alternative typology in Section 4, closing with a commentary on the role of referents, which demonstrates how this typology is helpful to aforementioned debates in philosophy of science. Section 5 concludes.

2 Austin’s Origins: An Epic Collapse

A characteristic feature of John Austin’s seminal *How to do things with words* is its argumentative style. It starts off introducing what seems like a highly useful distinction, but then proceeds to collapse it, laying the foundation for an improvement: speech act theory. In this section, I will trace the main threads of this argument. As it happens, paying attention to what performativity has meant in its original context provides key insights as to how one might draw on this conceptual resource to conceive of performativity of or in science more specifically.

The initial distinction Austin draws is between ‘constatives’ and ‘performatives’. Constatives are utterances that state or report a fact, such as when someone says “the door is open”. Performatives, on the other hand, are utterances with which the speaker performs an action, such as an “I do” uttered during a wedding ceremony, or “I bet you sixpence it will rain tomorrow” (Austin 1962, 5). Constatives, intuitively, express the kind of standard propositions that preoccupied positivist theorists of Austin’s time; by virtue of describing a fact of the world, constatives usually have a referent, and they are truth-apt, meaning they can be true or false. Performatives, on the other hand, do not seem to report on or state anything, and they do not appear to be truth-apt in the same manner. Rather, to say “I bet you X” or “I do” *is* to perform a certain kind of action. Performing a bet by way of an utterance cannot be true or false, but rather turn out successful or not (labelled by Austin as the performative’s ‘felicity’).

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As helpful as this distinction seemed, Austin encounters difficulties: it proves unstable. This is because, as Austin goes on to argue, to say anything at all also *is* to do something, whether that is uttering truth-apt propositions or felicity-apt bets. To utter a constative like “The door is open” is, for one, to perform the act of uttering something, *simpliciter*. It also, however, performs an act of, say, informing someone of a state of affairs or reminding someone, and so on. In this manner, constatives turn out to be kinds of performatives, too, and the distinction collapses. This leads Austin towards his second attempt, setting out to distinguish between the various ways in which one can perform or do things with words. Austin identifies three such ways.

First, *locutionary acts* are acts of uttering noises or words that have a certain meaning, by which Austin means sense and reference. This differentiates locutionary acts, which require the speaker to adhere to some rules of language (grammar, etc.), from non-locutionary acts, which would be acts performed without involving language or that do not carry any meaning.

Second, *illocutionary acts* are, roughly, convention-dependent and rule-governed acts performed in saying something. For instance, in uttering “I bet you X”, a speaker adheres to and invokes certain conventions according to which to utter the above *is* to bet, or counts as betting. If felicitous, both you and I end up believing that certain obligations now hold between the two of us that constitute a bet. This act is convention-based and rule-governed because there are certain conventions in place that provide the speaker with the affordance to issue bets in the first place.

Third, *perlocutionary acts* involve the psychological, behavioural or other effects that a speaker brings about by way of saying something. For instance, uttering “I bet you X” may invite a certain response from you, “Agreed!”. Or, you may have come to believe that I find X very probable; otherwise, I would not have bet on it. Or perhaps you are now offended that I had the audacity to bet you with real money, and so on. The key difference between perlocutionary and illocutionary acts is that the consequences of illocutionary acts are *conventional* (they only are a kind of act because there are certain conventions in place that make them so), whereas the consequences of perlocutionary acts are, in a way, *non-conventional*. Consider that to utter “I bet you X” is not to offend you, although it might have that effect on you (perlocution); however, it is to issue a bet, or constitutes the issuance of a bet, as per our linguistic and extra-linguistic conventions (illocution).

This well-trodden trinity of locution, illocution and perlocution has been highly influential in linguistics and philosophy of language. What is vital for a discussion on the performativity of science, and what has been important for Austin’s own collapse of his distinction, is that this trinity also applies to the initial constatives, including the kind of truth-apt factual assertions that naturally play an important role in science. A proposition like “the reproduction number R is above 1” uttered by an epidemiologist, for example, is clearly a locutionary act, as it expresses a meaningful proposition. Second, it is also an illocutionary act, the kind of which depends on context: it may be a warning to policymakers, a claim submitted for peer review, or a reassurance to colleagues about the reliability of a model. Third,

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it may have perlocutionary effects, such as citizens altering their behaviour or governments implementing public health restrictions, and so on.

A fourth, lesser-trodden dimension of perlocutionary acts is that of *perlocutionary sequels*. With sequels, Austin denotes further downstream consequences that an utterance might have, but which were unintended by the speaker (Austin 1962, 117–19). The concept is not fully explored by Austin, with many open questions remaining (Gustafsson 2020). Here, I use the term to highlight and refer to a broader class of downstream consequences a locutionary act might have, which may or may not have been intended, and which may have happened quite remotely after any particular utterance, yet still because of it. As a silly example, a fairly remote perlocutionary sequel of Douglas Adams’ writing ‘Don’t Panic!’ may be my quoting it here in a random journal article; unlikely intended, nor foreseen, and occurring decades later.

From this, a first takeaway is that the term ‘performativity’ was ambiguous from the start—arguably by design, and so much so that it prompted Austin to introduce an entirely distinct typology of ways of doing things with words (four, on the count above).⁴ Much work in speech act theory continued this quest to do away with ambiguity, yet interestingly, focused primarily on only one of the four ways: illocutionary acts. In this spirit, Austin anticipated an even more fine-grained classification of types of illocutionary acts and proposed, among others, to differentiate between *verdictives* or *assertions* (giving findings on facts or values), *exercitives* (exercising a power, like ordering, or voting), *comissives* (committing the speaker to future action, like betting), and a few others.

Instead of analysing types of illocutionary acts, I turn here to the question of how scientific communicative acts may fit this picture. As will be demonstrated in the next section, many influential contributions in philosophy of science and STS do appear far removed from speech-act theory. The remainder of the paper is about how to consolidate them.

3 An influential departure: Sociology of Economics

Beyond developments in speech-act theory, the uptake of Austin’s work in other disciplines has been multifaceted. It was marked by both deliberate departures on the one hand (see Derrida 1977), and by more faithful applications of the framework on the other. In philosophy of science, one might consider recent contributions by Paul Franco (2017) as comparatively direct applications of speech-act theory, cashing out acts of assertions as illocutionary acts with non-epistemic perlocutionary consequences, the clarification of which helps adjudicate legitimate non-epistemic values for science communication.⁵

⁴ See also Sbisà (2007) for further reasons of reading the collapse as an argumentative strategy.

⁵ See also Goodwin (2018), John (2019) and Franco (2019) as other examples of direct applications in philosophy of science.

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In contrast, what turned out to be a particularly extensive departure among philosophers of science was spearheaded by STS scholars Michel Callon and Donald MacKenzie. Today known to many economists, the ‘performativity thesis of economics’ was coined by Michel Callon (1998, 2007), claiming that economics, the science, has become part of the infrastructure on which today’s markets function, and that economics sometimes takes part in bringing about the very phenomena it analyses.⁶ A seminal case study for this thesis was offered by MacKenzie and Millo (2003), who analysed the uptake of the Black-Scholes-Merton (BSM) model of options pricing among traders in the 1970s. Crucially, as they argue, BSM’s mainstream adoption eventually shaped and helped bring into being the kinds of markets the theory was describing, instead of simply referring to pre-existing real-life structures that the model explained or predicted. For some period of time, they argue, this seemed to work as a self-fulfilling prophecy, in which actual markets increasingly converged with what the model would predict.⁷

Evidently, Callon and MacKenzie saw this as an instance of performativity in Austin’s sense: as I read them, the analogy is that uttering ‘I bet you X’ brings about something it is talking about (a particular bet), just like BSM brought about something it is talking about, too (particular options markets). In this fashion, Callon (2007, 316) took it that ‘a discourse is [...] performative [...] if it contributes to the construction of the reality that it describes’. More so, ‘[w]e are no longer in the register of truth as a reference but [...] in truth as fulfilled conditions of felicity’ (Callon 2007, 321). Similarly, MacKenzie and Millo (2003, 108; emphasis in original) argued that ‘economics does not describe an existing external “economy,” but brings that economy into being: economics *performs* the economy, creating the phenomena it describes.’ MacKenzie’s and Callon’s notion of Austin-inspired performativity also permeated wider circles and became prevalent among philosophers of science (Morgan 2015, 256; Morgan and Knuuttila 2012; Marchionni et al. 2024; van Basshuysen 2023; Khosrowi 2023).

As I will argue now, despite widespread adoption and counter to their own claims, however, their use of performativity-talk marks a departure from Austin. This introduces several open questions.

3.1 *Discrepancies between Austin & STS*

First, note that while Austin’s project is primarily concerned with singular utterances by individuals, Callon and MacKenzie have switched to talk of entire discourses of entire research fields, conceivably involving any number of utterances by any number of individuals, as well as non-verbal acts. For Callon, this is part of the

⁶ Callon concedes that aspects of his position are older, e.g. that he ‘takes up and pursues the assertion of Max Weber for whom accounting methods were the key prerequisites of modern capitalism’ (Callon 1998, 23)

⁷ Further research has been carried out in the last decades on the ‘performative’ nature of financial models shaping markets (see e.g. Svetlova 2012; Vergara-Fernández et al. 2023; Cassar 2025).

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definition cited above, and MacKenzie (2006, 19) makes a similar view explicit. Second, if, as stated, Callon’s goal was indeed to pick up on Austin, it seems peculiar to offer such a specific definition of science being performative only if a discourse changes the things ‘that it describes’, especially considering that one of Austin’s major moves was to collapse his distinction, arguing that *all* constatives are kinds of performatives, too. Would we not therefore need to consider all assertions by scientists as performatives? For this reason, the claim by Callon just two pages later that ‘*all* science is performative’ (Callon 2007, 318; emphasis added) suddenly seems to be much more in agreement with Austin’s own collapse, but at the cost of standing in direct contradiction with the more specific definition Callon offered just pages before. Undoubtedly, it is not the case that all science contributes to the ‘creation of reality’ in the unique way that economics and BSM are argued to be doing here; astronomy, to take an example, has yet to materialise a new star or planet by way of disseminating a theory about it. Classifying Pluto a planet would be a performative under Austin, e.g. a kind of assertion, but it would not affect anything about Pluto itself.

Offering clarification, MacKenzie (2006, 17) proposed what is now a widely-cited typology of performativity of economics. He distinguishes between *generic* performativity, where ‘an aspect of economics (a theory, model, concept, procedure, data set, etc.) is used by participants in economic processes, regulators, etc.’; *effective* performativity, where ‘the practical use of an aspect of economics has an effect on economic processes’; and *barnesian* performativity, where ‘practical use of an aspect of economics makes economic processes more like their depiction by economics’.⁸ The latter name is a nod to sociologist Barry Barnes (1983), and the self-fulfilling BSM example is argued to be a case in point.

MacKenzie’s typology is an improvement. In particular, thinking of kinds of performativity within science as subsets of each other clears a path to resolve the contradiction within Callon’s setup: while all scientific practices may be considered generically performative as in having *some* effect on the world, only a subset of those practices has the *specific* effects required to shape or bring into being its referents in the way the BSM is argued to be doing. While addressing one concern, however, MacKenzie’s typology introduces a series of more.

First, whereas Austin’s performatives are about ‘utterances’ issued by a speaker and how their meanings are mediated by conventional environments, MacKenzie defines the performativity of economics in terms of ‘use’ of theories. Use and utterance of propositional content, however, are different. For instance, an assertion of some theory issued by an economist should still count as performing an assertion in Austin’s sense, irrespective of whether the asserted theory is subsequently used by anyone or not. An illocutionary act of assertion might perfectly be felicitous, on the basis that it is being uttered in the appropriate conventional context such that interlocutors recognise it as an assertion, but it might still fail at its

⁸ For completeness, also *counterperformativity*, where “use of an aspect of economics makes economic processes less like their depiction by economics”.

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intended perlocutionary effect, namely, scientific uptake and use; people might not believe an assertion, deem it irrelevant, and so on. Austin’s insight that the performance of an utterance and its downstream consequences can come apart is entirely lost in MacKenzie’s typology, centred solely around use.

Second, there is internal tension between the categories on offer. Note that the label of *effective* performativity might suggest that *generic* performativity would have no effects whatsoever. Yet both uptake and use of an economic model could be considered ordinary perlocutionary downstream effects in Austin’s full sense. So what exactly is *effective* performativity supposed to be effective about? Looking at the definition, it tells us that the use of economics should have ‘an effect on economic processes’, but this raises even more questions. In particular, how could ‘participants in economic processes’, as detailed in the definition of generic performativity, switch to some other model without thereby also changing the very processes they are participating in? By virtue of ‘participants’ being literal constituents of the process in question, a change in their behaviour would, by construction, necessitate at least some change to that process, too, and MacKenzie offers no guidance as to where to draw the line.

Lastly, there is the question of how other disciplines that are not economics fit into the picture, especially given Callon’s claim that *all* science is performative. This applies even to the most encompassing category, generic performativity, defined by MacKenzie in terms of ‘participants’ and ‘use’. Clearly, this does not extend to all science; you may be forgiven for having difficulties in conceiving of participants in, say, remote astronomical processes. Only speaking of economics, MacKenzie once more offers no guidance as towards how to apply his typology elsewhere.

3.2 Saving Austin from Mäki

Another perspective staged against the above use of performativity was offered by Uskali Mäki (2013) titled *Saving Austin from MacKenzie*. Austin’s performatives, Mäki argues, are *constitutive* of a particular action. Uttering “I bet you X” in the right circumstances *is* to bet. Compare this with MacKenzie’s case, where the uptake and use of certain theories *causally* influenced what happened on specific markets. Unlike the utterance of a bet, however, the dissemination of a theory clearly does not *constitute* market practices; at best, it causally changes them. In this manner, Mäki argues, Callon and MacKenzie would confuse the ‘authentic meaning of performativity’ (Mäki 2013, 447).

Mäki is right to point out that there are confusing aspects to the STS departure from Austin. Ironically, however, Mäki’s exegesis itself does not appear particularly faithful to Austin, especially once we recall Austin’s own collapse of the distinction between constatives and performatives. As demonstrated in Section 2, the term ‘performative’ is by design ambiguous between a number of ways in which a speaker can perform actions or ‘do things with words’, only one of them being illocution. Granting that illocution may indeed have the constitutive character Mäki singles out, he mistakenly equates illocution as the only existing or relevant form of

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performativity, or way of ‘doing things with words’. This overlooks Austin’s main theme, which was to abandon the constative/performative distinction as an argumentative ladder, revealing that plain descriptive constatives turn out to be performatives, too, and that factual assertions are also members of some subtype of illocutions. An entirely plausible counter against Mäki’s critique would thus be to say that Callon, MacKenzie and others have, instead of illocution, mostly been interested in particular perlocutionary effects and sequels of economists’ assertions, namely those that affected behaviour among market participants and brought into being new social practices that were made possible by the adoption of a model like BSM. Nothing about Austin’s argument would prohibit employing ‘performativity’ to refer to such perlocutionary effects. This way, although for different reasons, both Mäki’s and MacKenzie’s appropriations of ‘performativity’ turn out equally faulty for invoking a highly ambiguous phrase that should, where it matters, be further specified.⁹

It matters, I take it, a great deal what we (do not) mean by ‘performativity of science’. Recall the debates hinted at in the introduction—strong and potentially far-reaching claims have been made on the brittle basis of the above notions of performativity of science, such as those on scientists’ responsibilities or criteria for model evaluation. Second, the concept of perlocution alone does not, as such, capture the more specific perlocutionary effects which, as some have put it, ‘bring into being’ a theory’s referent, or ‘shape reality’, or which result in ‘self-fulfilling prophecies’. In what follows, I defend a positive proposal aimed at placing these debates in philosophy of science on a sounder conceptual footing.

4 An Integrative Disambiguation

Although one could grant that some worries staged above against MacKenzie and Callon might be resolvable, the goal in the rest of the paper is to defend a different typology of ‘performativity of science’; one that still cashes out the particular feedback mechanisms STS scholars and philosophers of science have been interested in, but that also stays true to well-trodden terminology in speech-act theory.

4.1 *Reflexive Performativity as a Perlocutionary Sequel*

Turn again to Austin’s own collapse of the distinction between performatives and constatives (Section 2). If one accepts this move, note that one is already committed to at least one all-encompassing category that contains virtually all possible locutionary acts any given scientist might perform. These locutions may or may not have significant perlocutionary downstream effects and may or may not constitute any illocutionary act such as ‘assertion’; but, by virtue of being a locutionary act performed by an actual speaker, its execution already constitutes some change or

⁹ For other responses to Mäki, see Guala (2016a) and Peled (2020). Both take issue with the causal/constitutive distinction, arguing that Mäki’s constitution, too, requires certain causal relationships to be in place. Contra Guala, see also Lowe (2021, 145–47).

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‘effect’ on the world in a very trivial sense: the world would be different had it not been uttered.

Naturally, many of the interesting communicative acts performed by scientists often have non-trivial perlocutionary effects. If the IPCC (2022, 8) asserts that ‘emissions have increased since 2010 across all major sectors globally’, perlocutionary effects may take the form of uptake among policymakers, and perlocutionary sequels may take the form of further downstream reactions, such as enacting certain policies in response to this assertion. Similarly, if a government agency asserts that certain dioxins are carcinogenic, there may be certain behavioural changes in response. If astronomers assert the existence of some celestial body, this may change a variety of social practices, as it has numerous times throughout history.

All three of those latter examples, however, lack the more specific perlocutionary effects which Callon, MacKenzie and much of the related literature in philosophy of science have in mind; those effects that render a model shaping ‘the reality that it describes’ (Callon 2007, 316), or ‘creating the phenomena it describes’ (MacKenzie and Millo 2003, 108). Recall MacKenzie’s argument that traders at options markets priced options radically differently after BSM was disseminated and incorporated into trading procedures, in a way that changed actual market behaviour to be more in accordance with BSM. These cases involve much more specific perlocutionary effects that do not bear on just any practices, but specifically on the referents or target systems that the theory, model, etc., is intended to address. Against this background, in a first step, it appears apt to explicate these differences as follows.¹⁰ Asserting (or otherwise disseminating) a claim, prediction, concept, theory, model or similar concept is

- (i) *generically performative* if it has any impact on the world at all, and it is
- (ii) *reflexively performative* if it has not just any impact on the world, but specifically on the referent or target system it is designed to depict, such that the changes caused by this impact bear on the claim’s veracity (such as, but not limited to, predictive accuracy, model-target-fit, and referential stability).

This requires more corroboration, but first, some notes on terminology. First, MacKenzie’s label of ‘generic’ is retained; making the implied all-encompassing category explicit is useful, if just to distinguish it from more specific subsets. Nevertheless, its definition is swapped to be even more unapologetically generic, both to align with Austin’s collapse and to encompass scientific disciplines beyond economics. Second, both categories are quite broad, lumping together claims, predictions, concepts, models, and so on. This is as it should be; all of those are things scientists conceivably communicate, and there is, as of now, no reason to focus on any particular one. Third, as argued above, MacKenzie’s previous terminology of ‘effective’ does not succeed in cashing out a salient or clear subcategory of performativity of science. I replace it here with ‘reflexivity’, for two

¹⁰ This distinction has tentatively already been put forward in Ortmann (2025).

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positive reasons. For one, ‘reflexivity’ is already somewhat common among philosophers of science to refer to the feedback effects of scientific practices that are at issue here (Buck 1963; Guala 2016b; Northcott 2022). Also, the term does a better job at eliciting the self-referential character exhibited by the cases in the literature; more on this shortly. Fourth, reflexive performativity subsumes MacKenzie’s ‘Barnesian’ and ‘counterperformativity’, as well as other related types, such as self-fulfilling and self-defeating prophecies, reactive kinds, and others. The focus of this paper will not be on delineating those; it will be on consolidating the above distinction with speech act theory.

4.2 *Consolidating STS and Austin*

As detailed earlier, STS scholars such as MacKenzie and Callon have not been particularly interested in analyses of individuals’ utterances. Much more broadly, they have been employing performativity to refer to a variety of ways in which scientific theories are mobilised to affect and bring into being all sorts of social practices, including practices that said theories have been meant merely to represent. If notions of performativity of science, like the above, rely solely on individuals’ acts of assertion, however, this may appear insufficient for analysing the kinds of processes and institutions required to enable such mobilisation. Perhaps, then, performativity-talk is not suited to the purposes of STS and philosophy of science scholars after all.

This would be too quick a dismissal. Even while respecting speech act theory’s focus on individuals’ utterances, there is sufficient conceptual overlap for both disciplines to draw productively on each other’s resources. Note that I have taken some liberty in defining performativity above not only in terms of assertions but also in terms of other ways of disseminating a claim, model, or theory, and so on. Dissemination and assertion, however, are distinct. In Austin’s and Searle’s frameworks, assertions involve a commitment of the speaker to the truth of the uttered proposition; an utterance only counts as an assertion if it is evident to hearers that the speaker takes the uttered to be true. Disseminations, in contrast, may occur whenever a claim or model is being replicated or circulated without any particular truth commitment on the part of the speaker. This may happen, say, in an undergraduate course where various standard models of economics are being taught, but no particular claim is being made as to their empirical adequacy. Other conceivable ways of model dissemination may involve, for instance, committing code to a software repository, copying pictures of physical models, or selling computed model outputs (as happened with the BSM model and Fischer-Black’s price sheets that were heavily used in the trading pit). These are precisely the kinds of acts that historically have interested STS scholars. Yet, by virtue of not necessarily involving a literal speaker, let alone a speaker’s truth commitment, this broader class of disseminative acts has no obvious place in Searle’s or Austin’s frameworks.¹¹

¹¹ See McKaughan (2012) for a related point on conjectural acts in science.

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They are neither assertions nor easily classifiable as commissives, expressives, declarations, or the like.

On a second reading, however, speech act theory at large should, in principle, have no particular problem accounting for diverse acts of dissemination, for two independent reasons. For one, Austin himself already counted various forms of communication, such as written language or hand signs, as capable of carrying out speech acts. So, even when we consider Austin’s acts of assertion, we already have to picture a diverse range of possible communicative practices, extending far beyond utterances.¹² Against that background, then, ‘dissemination’ is helpfully ambiguous between the many ways in which claims, models, predictions, and theories may proliferate through social networks, extending to the replication of all kinds of cultural artefacts beyond written or uttered language, and not necessarily involving a speaker’s truth commitment.¹³ Although this broader class of disseminative acts has no explicit place in either Austin’s or Searle’s frameworks, appreciating ‘disseminatives’ as a distinct type of speech act should not introduce too much tension, at the very least because asserting a claim, model, etc., may just count as one among many possible ways of disseminating a claim, model, and so on.

Second, even when one does not want to count all forms of disseminations as types of speech acts, i.e. if one denies the existence of ‘disseminatives’, acknowledging the existence of diverse ways of downstream replication of someone’s locutionary content should still not disrupt speech act theory’s grand picture: to pick up on a prior point, a replication or use of someone’s claim may perfectly be regarded as a perlocutionary effect or sequel of said assertion.

In this manner, talk of reflexive performativity in science can, in principle, cater to both camps. Defined in terms of assertions and other ways of disseminating scientific outputs, it retains Austin’s focus on a speaker’s (or disseminator’s) act, while also accommodating MacKenzie’s emphasis on the diverse ways of mobilising the products of science, and their diverse consequences. As such, the distinction between generic and reflexive performativity requires hardly a concession from either side: it neither confines reflexive performativity of science to individuals’ utterances, nor does it require a particular stance on whether disseminations are a distinct type of speech act. At minimum, it requires that there can be perlocutionary effects that bear on a claim’s, model’s, etc., referent or target system.¹⁴

¹² Also compare Searle (1979, 6–7). See also Dethier (2025) on graphs as assertions.

¹³ This opens a debate on the propositional and epistemic status of artefacts, which I will need to bracket off here.

¹⁴ This also enables understanding the common phrase of particular ‘models’ being performative as shorthand for either (1) repeated assertion or dissemination of the very same model, claim, theory, and so on, or (2) remote perlocutionary sequels of a particular utterance or communicative act that introduced the model in question.

4.3 *From Illocutions to Referent Malleability: An Orthogonal Typology*

With reflexive performativity, we have now introduced a term that is wilfully ambiguous between asserting and other ways of disseminating scientific content. As a consequence, however, its relationship with other well-trodden distinctions in philosophy of language remains vague. Foremost, this applies to attempts at classifying types of illocutions, like John Searle’s famous typology. In this section, I will argue that the proposed framework is best seen as orthogonal to Searle’s typology of illocutions and that reflexivity as a feature of speech acts can cut across all types of illocutions. To that end, I will introduce the notion of ‘degrees of referent malleability’ and a third subset of the typology, ‘constitutive performativity’.

Building on Austin, Searle proposed a range of criteria by which various types of illocutions differ. The most important criterion is the purpose or ‘illocutionary point’ (Searle 1979, 2–4). The point of assertions, for instance, is to fit the world as it is; assertions are assessable along dimensions of truth. In contrast, the point of commissives is to change a social fact about the world; betting, for instance, commits one to a future action, a commitment that has not existed prior to one’s utterance. Similarly, declarations are intended to bring about a correspondence between the uttered proposition and a social fact; if someone successfully nominates you a candidate, then you are a candidate. Searle calls this element of the illocutionary point ‘direction of fit’, which can go in the direction of word-to-world, as in the case of assertions, or world-to-word, as in the case of commissives, or in both directions, as in the case of declarations.

Assertions that are reflexively performative sit rather awkwardly in this typology. While they might begin as plain assertions at the time of speaking, with their illocutionary point being to match the world, reflexive performativity is conditioned by the idea that there can be perlocutionary downstream effects that retroactively bear on the word-to-world fit, too. Consider a stylised example of a self-fulfilling bank run (Merton 1948). An economist might assert that a bank is unstable, attempting to fit their utterance to the world. The perlocutionary effect of causing distress among the bank’s clients, however, makes this an assertion that does not simply match some state of affairs, but that functions as an intervention on the assertion’s referent; it causes the bank to be less stable. Similarly, in a different scenario, an economist might try to do the opposite and avert a bank run by asserting that, against their best knowledge, the bank is stable and that clients should not worry. Notably, the economist’s attempt to avert harm would work if clients perceived the economist’s utterance as a trustworthy factual assertion, the true purpose of which, however, is not just to match the world, or to lie, but to bring about its world-to-word match. Suddenly, then, reflexively performative assertions come to share important features with other types of illocutions like commissives or declarations, blurring their illocutionary status.

Speculatively, it is precisely this blurred family resemblance between reflexive assertions and other illocutions that made performativity talk initially attractive to STS scholars like Callon and MacKenzie. However, without clarifying

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its roots, an overreliance on mere family resemblance has arguably led to confusion among their readership (see Section 3). Conceiving of the relationship between reflexivity and Searle’s typology as orthogonal, I argue, resolves much of it. Let me expand.

What Searle has in mind with his direction-of-fit scheme is a certain convention-enabled social malleability; performing a speech act like a commissive brings about a new or different social fact, and this is an affordance the speaker has only because of the specific conventional environment the speaker happens to be in. The conventional environment matters, as, for instance, only if your interlocutors understand what a bet is can you meaningfully issue one by way of an utterance. Contrast this with the bank run case. While certain conventions need to be in place for the economist’s utterance to be recognised as an assertion, the fact that the economist’s assertion has the transformative powers that it has is not mediated by conventions in the same manner. Conceivably, the bank’s clients would have recognised the economist’s utterance as an assertion, believed it as a fact of the matter, and then they would have made their own decision based on the information they received. Crucially, this is not the same as if there had been a hypothetical convention in place that would have the bank be unstable if an economist declared it to be; akin, perhaps, to how a public servant could declare a bank as insolvent via an administrative act. In addition to having the illocutionary affordance of asserting something about the bank, in theory, this endows the economist with a sort of perlocutionary affordance to intervene on the state of the bank by way of an utterance. In contrast to Searle’s convention-enabled social malleability, an assertion that is reflexively performative hence points to a certain non-conventional malleability of the world, mediated by perlocutionary sequels.

Besides being non-conventional, such perlocutionary malleability also need not occur only with social referents. A growing literature on what one could call the perlocutionary effects of classifications focuses on the way in which biological systems, like species or ecosystems, are affected by human ways of conceptualising them (Cooper 2004; Khalidi 2010; Fagerberg 2022; Witteveen, n.d.). Khalidi (2010, 346), for example, argued that human concepts of tame and non-tame wolves played a constitutive part in the selective environment of wolves, affecting their evolutionary trajectory and eventually giving rise to an entirely different species: the domestic dog. Similarly, Fagerberg (2022) argued that classifications of viruses affect their evolutionary trajectories, making virus kinds essentially dependent on human classifications.

Note, however, that both Searle’s convention-enabled-social-malleability and the other, neither-necessarily-social-nor-necessarily-convention-enabled malleability, share a common feature which I will refer to as ‘referent malleability’. In both instances, what happens is that whatever the locution in question is about or can be said to refer to is also being affected by the performance of that speech act, one way or the other. In the case of declarations, such as “I resign!”, it brings about a particular social arrangement that had not existed prior, yet to which the locution simultaneously refers. In the case of an assertion like the economist’s “The bank is

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unstable!” the bank’s status is being referred to, but it is also intervened on by the assertion’s dissemination and by way of a longer and indirect chain of perlocutionary sequels. In both cases, however, the performance of the utterance ultimately bears on its referent’s properties. In this manner, referent malleability could thus be understood as *the degree to which the referent of a locution is being affected by its performance in a way that bears on the locution’s veracity*, without assuming any particular mechanism by which this bearing has to take place.¹⁵

Because it comes in degrees, the concept of referent malleability enables mapping kinds of performatives along its axis. Recall the typology as it has been set up so far: rephrased in terms of referent malleability, it would follow that reflexive performativity exhibits at least some referent malleability, whereas generic performativity exhibits none. Still, if one accepts generic performativity as the all-encompassing category that Austin collapsed it into, we should expect all of Searle’s illocution types to surface somewhere in that framework, too. Put in terms of referent malleability, those speech acts that are entirely self-referential constitute a limiting case and could be said to feature the highest possible degrees of or complete referent malleability. For example, the locutionary referent of a declaration like “I resign!” is the performed act of resigning itself; uttering it makes it true because, in uttering it felicitously, one resigns. Contingent on the perlocutionary effects achieved, all of Searle’s illocutions can, in principle, pop up across the full range of referent malleability. Importantly, that also applies to assertions, although self-referential assertions are admittedly peculiar, such as the liar’s paradox: “This statement is false”. In a nod to Mäki’s critique (see Section 3.2), one might call locutions that exhibit this kind of complete referent malleability ‘constitutive performativity’—although note that, unlike in Mäki’s critique, this is decidedly not about the constitution of a particular type of illocutionary speech act (saying “this sentence is false” may still constitute a kind of assertion). What matters for referent malleability is that the act of uttering constitutes the utterance’s own locutionary referent. Although assertions perhaps have their paradigmatic place in generic performativity, and other illocutions have their paradigmatic place in constitutive performativity, between these extremes, reflexive performativity occupies an in-between class of partial referent malleability that, in principle, all illocutionary speech acts can inhabit, explicitly including acts of assertion. See the figure below for a summary of the subsets.

¹⁵ See also King and Mertens (2023) who consider a system’s ‘sensitivity’ in respect to the ‘employment’ of a self-fulfilling prophecy.

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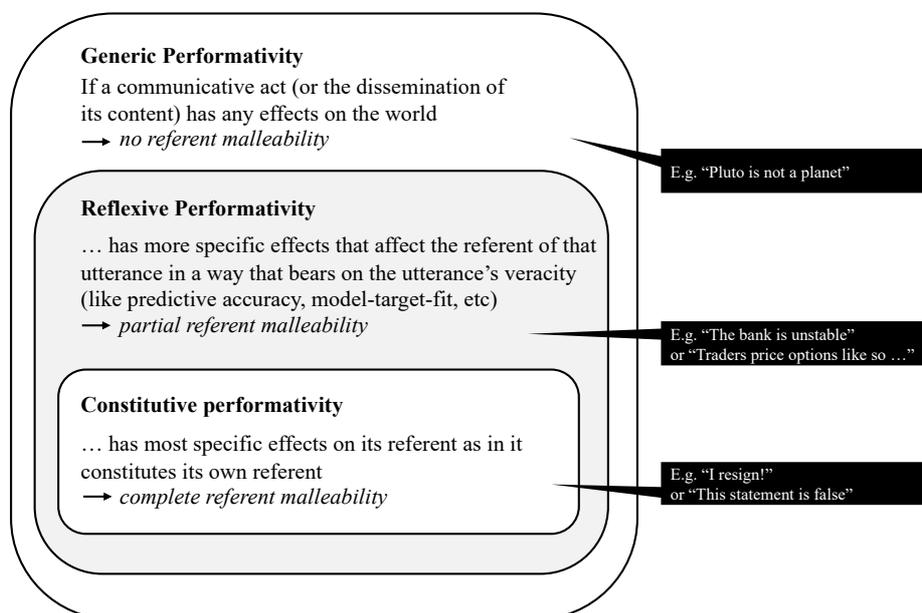


Figure 1: Classifying kinds of performativity along degrees of referent malleability

Admittedly, as a stand-alone category, constitutive performativity is presumably not of much interest to philosophers of science. What matters, however, is to have a framework for conceiving of the different ways in which scholars have meant science to be performative—one that has a comprehensible relationship with its conceptual origins, and which enables other pressing debates to be had. The relationship on offer, then, is this: Searle's types of illocutionary acts are mainly classified by the speaker's intent, involving the illocutionary point. In contrast, the proposed typology cuts across a speech act's perlocutionary effects or sequels, which may occur irrespective of the speaker's intent. While the two can come together, they need not, rendering both typologies orthogonal.¹⁶

4.4 What's a Referent?

The proposed definition of reflexive performativity asks three main questions. What aspect of the world is being changed due to the dissemination of scientific content? What is the referent of said content? And are they the same? Crucially, this makes the question of whether something is, in fact, an instance of reflexive, generic or constitutive performativity conditional on what one takes the referent or target system to be.

¹⁶ This orthogonality makes the proposed typology also consistent with deflationists of the illocution/perlocution distinction. See Kukla (2014) and Guala (2016a) for compelling examples.

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This runs counter to a tendency in the literature to declare phenomena as reflexive irrespective of particular communicative acts, let alone their locutionary referents. Robert Northcott (2022, 43), for instance, classifies ‘schizophrenia’ and ‘domestic dogs’ as reflexive kinds, but not ‘invasive species’ or, curiously, ‘electric toothbrushes’. There is, however, nothing about invasive species that would, in principle, make them immune to the kind of co-evolution that gave rise to domestic dogs or viruses (as argued by Khalidi and Fagerberg, see Section 4.3), and there is nothing about toothbrushes that would make them immune to a kind of cultural evolution that occurs in response to perlocutionary effects of findings on, say, dental health. Most things change over time, one way or the other, but reflexivity is (or should be) about whether they change as a result of the dissemination of particular claims, models, theories, etc., that refer to it.

The fact that the proposed typology demands a specification of the referent is, I contend, a merit. Among other things, it highlights that the question of what type of performativity one is dealing with can pose challenges in its own right, empirically and conceptually. Consider again the example from sociology of economics: the BSM model for option pricing has surely worked as a useful action-guiding piece of algebra for many traders, as evidenced by its widespread adoption. Yet, from this, it does not follow that it had a discernible real-life market as its referent to begin with. In short, what the BSM model does is, given personal risk preferences and estimates of volatility, to tell one how to value options under certain rationality assumptions. In other words, it gives traders tools to act consistently with a specified set of beliefs and assumptions. As a result, while the dissemination of this action-guiding algebra may have affected many trades and real-life markets, its relevant epistemic properties remain unchanged; given certain assumptions on rationality, it stands true that a certain price would be rational, whether you follow that advice or not. It could be argued then that the BSM model has not been reflexively performative after all, at most generically performative, precisely because it never was supposed to have a real-life referent, and at most serves as an abstract and counterfactual conditional.¹⁷ Interestingly, in their original paper, Black and Scholes (1973) themselves appear to jump in and out of this view. At times, they adopt the trader’s eye view as a guide to maximise profit (conditional view). At other times, they test back whether their model is consistent with actual market behaviour, i.e. whether it is empirically adequate as a representation of actual markets (representational view).

For the typology, this is not much of a problem, as in principle, it should be possible for any particular model to be involved in both generic and reflexive performativity over the course of its lifetime, contingent on perlocutionary effects and on its particular referents. MacKenzie, for instance, has argued that, after its initial publication, it took years of mobilisation and institutional changes for actual option prices to follow the model’s implications. Only as adoption among traders grew did it also become more adequate at representing actual markets. In this way,

¹⁷ The initial idea for this objection I got from Eric Winsberg in personal communication.

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different uses of the same model can refer to different referents and trigger different perlocutionary effects, and thus also obtain different performative status.

4.5 *The Typology In Action*

This is not merely an academic exercise. Specifying the supposed referent and being clear about what kind of performativity is at play is especially relevant for current debates on the ethics and politics of ‘performative’ science. Consider the following.

Not distinguishing between generic and reflexive performativity, van Basshuysen et al. (2021) compare advice that epidemiologists give to the public during a pandemic to advice that doctors give to patients. Both regularly project what would happen given some action, like if a patient changed their exercise regime, or if the public adhered to a social distancing policy. Reasonably, both the doctor and the epidemiologist may have difficulties predicting what a patient or the public will do upon receiving their advice. In short, they may be sure about ‘if p, then q’, but they need not be sure whether ‘p’ upon giving their advice; perlocutionary effects can be hard to predict. This is then where van Basshuysen et al. (2021, 121) develop a strong claim: ‘Just as we should not think that a doctor is unqualified because [...] she cannot [...] forecast how much longer, exactly, a patient would live under a changed exercise regime, [...] it is unhelpful to assess the utility of epidemiological models based on their predictive abilities alone.’ Instead of valuing only their accuracy, the argument goes, we could appraise the ability of an epidemiological model to change people’s behaviour in a way that prevents harm.

This argument has been met with resistance (Winsberg and Harvard 2022; see Ortmann 2025 for a discussion). Here, employing the above notion of referent malleability, I will just point out that the comparison to doctors appears misleading precisely because it conflates reflexive with generic performativity. Under normal circumstances, when doctors give advice, one expects them to utter true conditionals which, crucially, remain true (or false) irrespective of what the patient does. In terms of this paper, the doctor’s example strikes as a case of generic performativity because their conditional speech act does not affect its locutionary referent in a way that changes its veracity – there is no referent malleability. The mechanisms that link exercise to health remain as they are after the doctor’s speech act, and they remain as they are irrespective of what the patient does upon hearing the advice. Against this background, taking performativity as a legitimate purpose, and taking it to be distinct from epistemic purposes, could be understood as suggesting that the doctor should outright lie to their patient: falsely exaggerating negative effects of their lack of exercise might spur them into a healthier lifestyle. This, of course, seems unacceptable.¹⁸

Conditionals that are reflexively performative are structurally different. In particular, what would need to happen for a conditional to be reflexively performative is that its dissemination bears on the circumstances that made the conditional true or false in the first place. That said, although they overlook this

¹⁸ See also John (2019) on the ethics of ‘wishful speaking’.

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difference in their examples, van Basshuysen et al. (2021) do suggest a feedback loop that might have made this happen in the epidemiologist’s case: policy compliance is a key parameter in pandemic models, but compliance is also dependent on public perceptions of the actual danger, which in turn are informed by disseminated model projections. This plausibly makes policy compliance a moving target, estimations of which also have the potential to influence it. This contrasts with the doctors’ example, where the referent in question consists of, say, biological mechanisms that link exercise to life expectancy, which remain unaffected by the doctor’s conditional assertion. While van Basshuyen et al. document cases of generic performativity and suggest a plausible case of reflexive performativity, they base a strong normative claim on the latter, but without much evidence for it. Partly, I suspect, this is because showing a change in the truth of the conditionals amounts to a much more demanding empirical exercise, and partly because they do not distinguish between generic and reflexive performativity.

5 Conclusion

Reflexive performativity is an in-between class situated between generic and constitutive performativity, all of which exhibit different degrees of referent malleability. I have argued that this typology reconciles notions of performativity of science that have proven popular among philosophers of science and STS scholars with speech act theory more broadly. In particular, the proposed typology is best understood as orthogonal to Searle’s typology of illocutionary speech acts; the former is contingent on perlocutionary effects and the assumed referent, the latter is contingent on the illocutionary point. Should this argument prove unsuccessful, at the very least, it has been demonstrated that a better-grounded conceptualisation of performativity in science is indispensable, especially for debates on communication ethics and values in science.

Finally, another upshot of the proposed framework is that it provides a foundation for relating work by philosophers of science that relies on speech act theory (e.g., John 2019; Franco 2017, 2019; Goodwin 2018) to the literature on performativity in STS. So far, both have coexisted independently, and a more principled taxonomy that encompasses both may help clarify their relationship.

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