Improvisation as Online Planning

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Improvisation as Online Planning

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Abstract. The conceptual relationships between two types of
action, planned action and improvised action, are studied. Instead
of seeing them as mutually exclusive types of action, it is argued
that they mainly differ from each other gradually, and most of our
temporally extended action sequences contain both improvised
and previously planned parts. Improvisation can be seen as online
planning, that is, as a process in which the planning of an action
sequence overlaps with its execution. The strongest case for such
a view is improvised joint action, but the view arguably applies to
individual improvisation too. Seeing improvisation and planning
as closely related action types that employ many of the same
cognitive and bodily capacities makes improvisation seem less
mysterious and planning less mechanical than they have often
been seen.

Keywords. Improvisation, planning, joint action

1 Introduction

This paper studies the conceptual relationships between planning and impro-
visation. These two types of acting have been taken to be completely distinct
and mutually exclusive. Characterizations of improvisation are often made by
contrasting it with planning: improvised actions are taken to be actions that
are unplanned. Planning involves constructing sequences of actions in a way
that is expected to lead to the satisfaction of one's goal, and then carrying

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out those actions as planned. Whatever improvisation might be, one thing is taken to be clear: Improvisation is *not* planning.

This was my initial hypothesis as well, but after some thought, I became suspicious. It started to seem to me that an action can be both improvised and a part of a plan. For instance, there can be planned improvisation, as when I decide to practice musical improvisation after supper tonight. And there can be improvised planning, when I suddenly learn that my plan to get to the airport by bus is not feasible due to a strike and I have to come up with a new plan immediately. So I had to reject my initial hypothesis. Being a simple-minded analytic philosopher, I deleted the "not" and replaced the initial hypothesis with a new one: Improvisation is planning. More specifically, improvisation is one particular type of planning. I will try to defend this thesis in this paper.

I will start by presenting some characterizations of planning and improvisation that make a strong contrast between them. I will then offer some example cases that seem to challenge their stark opposition. Then I will consider cases of improvised joint action and argue that, like all joint action, it is also planned, given that plans are understood sufficiently broadly. I will then consider individual action and argue that the same holds there, and suggest that improvised action falls under a specific type of planned action. I will then consider some possible criticisms. Finally, I will consider some consequences of such an understanding of the relationship between planning and improvisation.

2   Planning and improvisation contrasted

Let us start by considering the opposition between the two types of acting in more detail. In the literature, planning and improvisation are often contrasted. Witness, for example, Mark Risjord (2014) who says in the context of musical improvisation:

> Both the harmonic structure and the rhythmic feel are continuously maintained by the actions of the individual musicians. Their actions are improvised in the literal sense that the vast majority are not planned in advance.

In the context of Artificial Intelligence, Philip Agre (1997, pp. 155–156) writes:

> Schemes that rely on the construction of plans for execution will operate poorly in a complicated or unpredictable world such as the world of everyday life. In such a world it will not be feasible to construct plans very far in advance; moreover, it will routinely be necessary to abort the execution of plans that begin to go awry. If contingency really is a central feature of the world of everyday life, computational ideas about action will need to be rethought. [. . .] For these reasons, I propose that activity in worlds of realistic complexity is inherently a matter of *improvisation.*

Kendra & Wachtendorf (2007) consider improvisation and planning in emergency management, and contrast them by suggesting that improvisation is something that has to be resorted to when planning is not an available option:

> improvisation has had something of a checkered history in the emergency management field since its appearance in a disaster response seems to suggest a failure to plan for a particular contingency. [. . .] Thus improvisation occupies a somewhat conflicted space in the realm of emergency and crisis management capacities: we plan in detail so that we don't have to improvise, knowing that we will have to improvise.

Planning can be defined as construction of sequences of action targeted to reach a certain goal when executed. Implicit in such ideas of planning is that planning involves two stages: the formation of a plan and the execution of a plan. Oftentimes the word "planning" refers only to the formation stage. We can say that a *plan* is a result of such planning, and an action is *planned* if and only if it is part of a plan. There is some ambiguity in calling an action planned, however, because an action can be planned but not executed. Typically when we talk in the present or future tense, we talk about actions that have not been executed yet, whereas if we say in the past tense that an action was planned, we usually mean that it was executed in accordance with a plan.

Several typical characteristics of planning and planned action can be mentioned: For one thing, planning is *intentional* activity. Planning is also *goal-directed,* because plans are made for satisfying goals. The goal provides

satisfaction conditions and criteria for success. Planning is *structured* in the sense that there are constraints between actions, and complexity is broken down into parts and patterns, often into subplans. Finally, planning is *co-ordinated* with respect to several variables like space, time, and resources. However, planning typically leaves room for refinement and adjustment, so plans do not necessarily have to be complete, or specified in full detail.

What about improvisation? Dictionary definitions suggest that improvisation is acting spontaneously or without preparation. Hence, because planning is generally understood as preparation for action, as construction of sequences of action targeted to reach a certain goal when executed, planning and improvisation seem to be exact opposites of each other. Standard accounts thus lead to an initial definition: An intentional action is improvised if and only if it is not planned.

However, it seems that planning and improvisation do not completely exclude each other, because an action can be both part of a plan, and thus planned, and improvised. For instance, it seems that there can be both improvised planning and planned improvisation.

In contrast to *planned planning*, in which I, for instance, decide beforehand that tomorrow I will do some planning for my forthcoming trip, I may sometimes have to do *improvised planning*, as when I learn that I'm supposed to attend a meeting on the other side of the town in 30 minutes and I will have to come up with a plan to get there as quickly as possible.

Similarly, in addition to *improvised improvisation* in which I will have to start improvising unexpectedly, there is also *planned improvisation*, for instance, when I know beforehand that tomorrow I will be performing in an improv theatre or playing with band mates who expect me to do some soloing. Such cases clearly count as improvisation but it would be misleading to call them totally unplanned, because they often involve some preparation and typically draw from a repertoire of previously exercised routines and practices (Vera & Crossan, 2005).

So it seems that improvisation and planning are not mutually exclusive action types after all. One and the same action can be both planned and improvised, and many of our daily activities contain both previously planned and spontaneous elements. Witness Gilbert Ryle (1976), who in his paper "Improvisation" argued that every instance of thinking involves partly novel

elements, like thinking about this particular thing in this particular occasion, and partly conventional and practised elements, such as previously learned patterns, conventional meaning, etc. It seems that things are not so simple that we could strictly divide actions into planned and improvised. We have to reject our initial definition of improvised actions as actions that are not planned.

3   Improvised joint action

To argue for my claim, I will study the case of collective improvisation, because I think it will reveal something about the nature of improvisation more generally. I will argue that collective improvisation is to be understood as joint action, and that joint action, the way it is generally understood, requires some planning.

In the philosophical literature on social and collective action, joint action is standardly understood as something done in order to satisfy a joint goal or a collective intention. As representative samples from the literature, consider the following quotations. According to Raimo Tuomela (1991), "a relevant we-intention must accompany any intentionally performed joint action." Seumas Miller (1992) says: "Joint actions are actions directed to the realisation of a collective end." Finally, Margaret Gilbert (2006) says (using the term "collective action" here in the sense of joint action or "acting together"): "I take a collective action to involve a collective intention."

What is the role of the joint goal or intention in joint action? It has several roles: It makes the action intentional at the group level, not only at the level of individuals. It specifies satisfaction conditions and criteria of goodness for successful joint action. It provides constraints for individuals' action, ensuring coordination of actions while leaving some flexibility for the parts of the individuals. It also enables cooperation and adjustment to changes, for instance, helping others to do their parts if necessary.

But these look very much like the characteristics of planned action that we discussed above! It seems that the joint intention provides joint action with goal-directedness, structure and coordination that are characteristic of planned action. With multiple agents doing things together, a certain amount

of coordination is necessarily required. This coordination, provided by joint goals or intentions, is what makes a collective endeavour a joint action, and at the same time makes it into a (at least loosely) planned action.

In fact, some philosophers, like Michael Bratman (2014) and Kirk Ludwig (2016) explicitly characterise collective intentions involved in joint action in terms of *shared plans*. So it seems that in the case of joint action, some planning is necessarily involved. If this is correct, there cannot be improvised joint action that would be totally unplanned. Under such a conception of joint action then, our initial definition of improvisation as something that is not planned would entail that improvised joint action is impossible.

However, improvised joint action does not seem to be impossible (see, e.g., Hagberg, 2016). For instance, jazz bands are often said to improvise together, and so are improv theatre groups. These seem to be cases of joint action. Even complex collectives like organizations and corporations are sometimes said to improvise, so joint improvisation does not seem inconceivable.

How does improvised joint action differ from other instances of joint action? Let us try to find an example by modifying John Searle's (1990) thought experiment. Consider two cases involving multiple agents in the park: In the first case, there are people who are running for shelter when it starts raining. In the second case, a dance group is performing a modern ballet, in which the performers are running for shelter. The agents' behaviour in these cases can be identical, but there is a clear difference in the intentional states of the agents. Searle uses the example to demonstrate a difference between individual intentionality and collective intentionality. In the first case, each person is acting individually, trying to find some shelter. The others' intentions are not relevant except for coordinating one's own actions with those of the others. For instance, one should avoid running into others and keep an eye on whether one can make it to the shelter as long as there is room. In the second case, however, there is a joint intention to give a performance where the individuals are exhibiting similar movements as people running for shelter, but they are now doing it as a part of a shared plan. They are trying to satisfy a collective intention, and everyone's actions are relevant for its satisfaction, even though the behaviour of each is identical to what it was in the first case.

In addition to the difference that Searle emphasized we can note that there is another crucial difference between these cases. The first is probably im-

provised: everyone is facing a surprising situation, the rain, and starts to improvise in order to find a shelter. In contrast, the second one is planned in advance: The individuals have agreed to participate in the performance and they have a shared plan to simulate people who are running for shelter, even though not each step is pre-planned, but the high-level plan is previously agreed upon.

Neither case is exactly what we are looking for, however. The first is a case of improvised collective action, the second one is not. However, the first one is not a joint action, although the second one is: This is because there is a shared goal and the, possibly very minimal, shared plan to reach it. Can we modify the example to yield a case of improvised joint action? Here is one possible candidate: An improv theatre group receiving the suggestion 'rain'. Again, the behaviour of the agents can be assumed to be indistinguishable from the two previous cases: given the suggestion 'rain', everyone starts running for the shelter.

This seems to be a case of joint action, and it is improvised. It is not totally unplanned, however, because there is a joint plan to perform improv theatre. Moreover, the suggestion provides a more specific joint goal: To perform improv theatre in which people are facing a sudden rainfall. So this is a case of planned improvisation. To get to improvised improvisation, we will have to modify the example. We may assume that the group has decided to meet in the park but they have not agreed on the exact location. It starts raining and everyone gets the same idea: the shelter would be the best place to meet. Moreover, everyone will expect that others get the same idea, so they all run for the shelter and hope to find the others there.

It is not fully clear whether this case involves improvised improvisation. We might be inclined to think of it as improvised planning instead: There was an initial plan to meet in the park, but the plan was vague and everyone thought that they would need to wander around the park to eventually gather everyone together. However, the rain made one coordination point salient, allowing everyone to refine the plan in the same obvious way and hence the group to converge on a shared plan to meet at the shelter.

If we are inclined to think of the case as improvised improvisation, then it is not absolutely clear that it should be understood as a joint action either: We might think that there was no joint plan, but everyone, while running for cover, just improvised and expected others to improvise, so there was no

joint intention or a shared plan. There was of course the original plan to meet somewhere in the park, but one may think that the plan was put aside when the rain started as everyone came to have a more immediate goal to find some shelter. But then it seems that even though the joint action of meeting somewhere in the park was – with some luck – successfully carried out together, the improvised part of running for shelter was not part of the shared plan and hence not a joint action. Everyone just improvised individually with the happy consequence of the original goal becoming satisfied. However, then it seems that we cannot say that this was a case of improvised joint action either.

We can imagine other collective cases of improvised improvisation, e.g., spontaneously created political movements. In order for them to count as joint actions, the individuals must share a goal and somehow coordinate their actions to reach that goal. In other words, a shared plan must emerge. It does not exist beforehand, but must be created on the run. It thus seems that improvisation in joint action is possible, but it is intentional, goal-directed, and coordinated, and as such it satisfies the typical characteristics of planned action. Hence, insofar as joint action is concerned, improvisation means creating a plan on the spot and filling in its details during its execution! The big question then becomes – and this was suggested to me by my colleague Pekka Mäkelä when I told him about where I had gotten with my thinking thus far – "Maybe this holds more generally?"

In what follows, I will proceed to the general case and argue that the same holds there: Improvisation is intentional and goal-directed. Neither fully automatic reflex actions nor aimless activities can be called improvisation. I argue that typical characteristics of planning are manifest also in cases of improvisation. Hence, I will propose that actions are improvised just in case their intentional execution starts immediately when they have been selected. If this is correct, improvisation means construction of a sequence of actions aiming at a goal, that is, construction of a plan, during its execution. To come up with a term, we can borrow terminology used in Artificial Intelligence and robotics, where, for instance, path planning can be done in two ways: In cases with complete prior information about the environment it can be done *offline*, or in advance, whereas in cases with incomplete information it must be done at least to some extent *online*, when a robot is already in the environment receiving more information about it, detecting collisions and avoiding obstacles (see, e.g., Yegenoglu et al., 1988). Hence, we can call

improvisation *online planning.*

4 Improvisation in general

Could it be that all improvisation, both in joint and individual action, is simultaneous plan construction and implementation? After all, improvisation is intentional action. Unintentional actions, like reflexes, are not considered to be improvisation. Intentional actions are often taken to be actions done with an intention, and some theories of intention include plans as components of intentions (Harman, 1976) or identify intentions with action plans that one is committed to (Bratman, 1987). If these theories are true, then improvisation involves plans by definition.

Here it is better not to commit ourselves to theories that make a conceptual connection between plans and intentions at the outset, because for our argument that would be question-begging. An argument can still be made for improvisation requiring plans. As said above, improvisation is goal-directed: Aimless activities, like wandering around in the city without a goal, destination, nor purpose, do not seem to be improvisation. In improvisation, there is some goal that provides criteria for success and constrains the range of actions available. The actions are thus instrumental: If wandering around in the city has a purpose, like exploring the city's art nouveau architecture, or just enjoying the vibrant city life, the selection of one action instead of another becomes a matter of meaningful decision, a matter of evaluation instead of something random and purposeless. The goal is not necessarily external, however: In musical improvisation, for example, the only goal may be the activity itself: to engage in musical improvisation, even though there might be other criteria for the evaluation of the activity, for instance, the musical quality it reaches or the pleasure it brings.

In addition to the goal, also the history of actions taken so far constrains the future. Certain actions in the past may restrict available options later or make some other options available. This provides an element of temporal coordination that is another typical element of planning. For example, in musical improvisation the chord progression played so far constrains the selection of future chords and previously played melodies provide material for further variations. Also there is usually a stock of available routines, patterns,

and context-specific criteria that guide the selection of actions, like genre in musical improvisation.

Finally, successful improvisation leads to a result: a coherent performance, a sequence of coordinated and purposeful intentional actions, in other words, a completed plan. The plan here is completed in two senses, in being both fully specified and also in being executed. Hence, it seems that the typical characteristics of planning are manifest also in cases of improvisation and we can therefore propose the following definition: *An action is improvised if and only if it is planned and executed (more or less) simultaneously.*

We can extend this idea for sequences of actions by saying that a sequence of actions is improvised just in case it has been constructed during the execution of the sequence. The contrast then is between those plans that have been completed before the action and those that have been formed during action, that is, between those activities that have been planned beforehand and those that have been planned online. These characterizations relativise these concepts to the level on which we identify the actions, and they allow the possibility of both planned and improvised action sequences that have both planned and improvised actions as their constituents. This is useful because in most real life activities there are alternating periods of previously planned and improvised parts.

There are other characterizations that come close to our proposed definition. For instance, Davide Sparti (2016) in his study of musical improvisation, compares improvisation and composition.

> When speaking about improvisation, one must start out with the premise of the existence of the concept of compositional plan (often but not necessarily tied to scores). Indeed, between improvisation and composition, there already exists a conceptual relationship: our understanding of improvisation depends upon—or is a consequence of—a work-specifying plan, if not textuality; the (notated) musical work represents the standard against which or on the basis of which) improvisation, by contrast, measures itself, differentiates itself, and lets itself be admired. At least within this cultural binary, improvisation *presupposes* the concept of music that is premediated and executed from a score. Nonetheless, they are two distinct modes of musical creation.

According to Sparti (2016), composition is marked by three things: *a long period of time* leading up to the finished work, the possibility of *revision* before the public exhibition, and the circumstances of production remaining *hidden* from the public. In contrast, improvisation is characterised by *inseparability*, that is, the temporal collapsing of composition and performance, *irreversibility*, which means that there is no revision but any strategy of recovering from mistakes becomes part of the music itself, *situationality and contingency*, meaning that each act takes place here and now, *originality*, entailing that repeating yesterday's solo won't do, and *responsiveness*, which means close attention to history, affordances, and the other participants.

All this seems consistent with our ideas above. Sparti does not aim at an explicit definition, but sometimes says things that come very close to our definition (Sparti, 2016, p. 187):

> Improvisation is constitutively performative, it lives and dies in the course of a single, unrepeatable performance. An action that, while it unfolds, invents its own way of proceeding—music simultaneously performed and invented—improvisation can be called the performance of a composition composed during its own performance[.]

This seems to be a special case of our definition of improvisation as construction of a plan during its own execution. Similar ideas have been presented by others as well (Alperson, 1984), and if one looks further back at the literature, it turns out that the view of improvisation as online planning is not new at all. Indeed, according to Jeff Pressing (1988), it was the predominant view up until Baroque times:

> The approaches in the literature to the teaching of improvisation may be broadly grouped as follows. First, there is the perspective overwhelmingly found in historical Western texts, that improvisation is real-time composition and that no fundamental distinction needs be drawn between the two. This philosophy was dominant in pre-Baroque times but had become rare by the eighteenth century. In practice this results in a nuts-and-bolts approach with few implications for the modelling of improvisation beyond basic ideas of variation, embellishment, and other traditional processes of musical development.

The later approach, according to Pressing (1988), brought in patterns, models, and procedures that could be used in improvisation to produce stylistically appropriate music, and historically took over the previous one, followed by further developments. As Pressing's focus is on teaching, the mentioned reasons for the decline in the view's popularity seem to do more with its poor resources to provide novel pedagogical ideas than its prospects of being a true theory.

Perhaps it would be useful to take another look at the view and try to see whether empirical evidence from cognitive psychology, and behavioural and neurophysiological studies could either refute or provide support for the old view. This is something I cannot engage in here due to lack of space and competence, and the evidence may still be too sparse for drawing any strong conclusions. What seems to be expected from the hypothesis of improvisation as online planning would be that instead of seeing a clearly differentiated sets of cognitive capacities and neural processes responsible for improvisation on the one hand and planning on the other, the differences should be mainly quantitative: Many of the same cognitive capacities and neural processes are involved in both planning and improvisation, but only in different proportions.

In terms of the currently popular dual-system or dual-processing approaches to human cognition (see, e.g., Frankish, 2010), a natural idea is that improvisation depends heavily on so-called System 1 or Type 1 processes that are thought to be fast, automatic, and intuitive, whereas planning is usually thought to involve slow, conscious, and deliberate processes of the System 2. However, my understanding of the current state of the debate is that it is not entirely accurate to speak of two separate systems but rather there are two different types of processes and there is plenty of more interaction between these two processes than postulated in the original versions of the dual-system theories. If this is true it seems to provide some support for the view that planning and improvisation lie on a continuum and their differences should be taken to be mostly quantitative. In fact, I find it plausible that planning uses some of the same Type 1 processes that improvisation does in the stage where one comes up with alternative courses of action. The main difference is just that in planning you have the luxury of revision available.

An account of improvisation as online planning is still consistent with the experience of improvisation as *intuitive*: Processing is to a large extent automatic when there is little time to reflect and revise. This also means

that the agent's experience of acting in an improvised manner can be very different from situations in which the actions are chosen in accordance with a pre-existing plan. However, at least in my own phenomenology the two types of action are not clearly distinct, and in extended sequences of improvised action I occasionally find myself anticipating and preparing for the future in addition to just spontaneously selecting the next action. Accordingly, it should be expected that there are some conscious System 2 processes involved in improvisation as well due to its goal-directedness and the presence of various constraints: Even though improvisation would be expected to involve reduced amounts of conscious cognitive control than planning due to the time constraint that requires transferring action selection from conscious Type 2 processes to fast Type 1 processes, there should still be a certain amount of monitoring the progress with respect to the goals and checking for coherence in the progress of action, in contrast to totally unconstrained, aimless and spontaneous activities or completely mechanical activities that require no planning at all, like following a completely specified plan without deviations and responsiveness to the environment.

Something like this was suggested already in Pressing's (1988) model of improvisation, and similar findings have been reported in more recent studies on neuroscience of musical improvisation as well although the research in this area remains contested (Beaty, 2015; Landau & Limb, 2017).

5   Possible criticisms

One could raise the following objection to our attempt of defining improvisation as online planning: What about the role of novelty, creativity, or originality in improvisation? Is that not one of its necessary features that distinguishes improvisation from planned action? If that is the case, we should not say that improvisation is merely online planning, because that downplays the role of novelty of improvisation, the element that Ryle (1976) coined "un-tram-likeness". Would it not be better to say that improvisation is online planning that results in something novel or original? However, we may reply that the aspect of novelty applies to planning as well, but we must recall that *planning* of actions, that is, plan construction, is different from mere *following a plan*, that is, plan execution: If a situation requires planning

of actions, it means that there is no ready-made plan or routine at hand that one could directly follow. Instead, a plan must be created. As Ryle (1976, p. 70) observed, "If Wordworth's seventh sonnet had been a repetition of his sixth sonnet, it would not have been a new sonnet, and so not have been a new composition." Moreover, since plans are usually not specified in full detail, even mere following an existent plan typically involves thinking and responsiveness to the particulars of the situation and hence contains an element of novelty and uniqueness. According to Ryle (1976, p. 72), if thinking is involved, then there is something new happening:

> Certainly some of our thinking really is unmisleadingly, if over-picturesquely, describable as the taking of successive steps. But preoccupation with the successiveness of such steps makes us forget that each such step by itself may need for its individual description one or more of our epithets of un-tramlikeness. It must, if it is to be a positive move in a more-or-less consecutive train of thought, itself be experimental and/or apposite and/or bold and/or imaginative and/or wary, etc. Else their owner had not been thinking what he was saying or doing in the taking of that step, but had taken it from sheer habit or reflex or mimicry, etc.

Hence we see that both planning and typically also plan following include an element of novelty just like improvisation does. Hence, this is not really an objection after all.

Beth Preston (2012) has argued for the importance of keeping planning and improvisation conceptually distinct. She argues that action theory cannot distinguish between them for the reason discussed above that intentions and plans are often conceptually linked together. According to Preston (2012, p. 51), the folk conception of plan involves an idea of a "conscious, explicit, advance formulation of the end or action to be performed", and such a conception allows a distinction between planned and improvised action. Action theory, by adopting a technical notion of plan, which does not require conscious attention nor be formulated in advance of the action, is in danger of losing the distinction, because action theorists who think that intentions (which are assumed to be present in all intentional action) necessarily involve plans will be unable to conceive of actions that are both intentional and unplanned. This is a good critical point that forces action theorists to either

deny the importance of the distinction or to try to make the difference clear in their accounts.

Not all action theorists endorse a close conceptual connection between plans and intentions, but even those who do may have resources to distinguish between planned and improvised action. Preston (2012, p. 62) considers some attempts like the suggestion of drawing the distinction between planning and improvisation on whether the goal has been specified in advance or not. She argues that the attempt fails, because in many cases the goal that governs improvisation has been adopted well before starting to act. To employ her example, I may have decided in the morning to prepare dinner right after coming home from work, but the whole process of deciding what to eat and preparing the dinner are improvised. So the difference cannot be in whether the goal has been selected in advance.

However, the difference might be understood in terms of whether the actions themselves, not only the goal, have been selected in advance. Planned actions, in the folk sense, are those in which both the goal and the action have been selected some time before starting to act, whereas improvised actions are those in which the selection of the action happens at the same time that one starts to act. Both may be understood to involve an intention, and hence a plan according to the theories discussed above, but there is a difference between improvised and planned action: In planned action there is time to do some planning before acting, whereas in improvised action there is not, but the plan has to be constructed during the action. The less time there is between selecting actions and performing them, the more improvisatory the actions are.

In philosophical action theory, there is in fact an existing distinction that can be employed to distinguish between previously planned and improvised actions, namely the distinction between intentions that guide the present action and intentions that commit one to future actions. There are various terms used for these two types of intentions, for instance, Searle (1983) calls them intentions in action and prior intentions, respectively. On the other hand, Bratman (1987) calls them intentions in action and future-directed intentions, whereas Mele (1992) calls them proximal and distal intentions, respectively. Adopting here Searle's terminology, we may say that improvised actions are those that were prompted solely by intention in action, whereas previously planned actions were results of prior intentions. Hence, it seems

that standard action theory does have some tools to distinguish between previously planned and improvised actions, even if we were to adopt the technical notion of a plan that is conceptually connected to intentions.

Above we have cast doubt on whether the difference between planning and improvisation should be understood as a qualitative difference after all, or whether it should be understood mainly as a difference in the amount of time between deciding on a course of action and initiating the chosen action. This doubt extends also to the distinction between prior intentions and intentions in action. Perhaps they are not two different types of intention, but their main difference is in the amount of time between the making the decision and starting to act. To be sure, quantitative differences may give rise to qualitative differences as well: the time difference between the formation of prior intention and initiation of action provides the agent with an opportunity to reconsider and revise that lacks in improvisation. Perhaps the main reason why action theorists have in the recent decades paid so much attention on plans is because prior intentions, which involve a commitment to future action, have been more difficult to analyse in terms of beliefs and desires than intentions-in-action. Hence, they have been one of the main motivations for so called belief–desire–intention theories of action that take intentions to be irreducible to beliefs and desires, and crucial for understanding intentional action (Bratman, 1987). Improvisation, insofar as it can be understood in terms of intentions-in-action seems to be amenable to an analysis in terms of belief–desire theories, whereas prior planning seems to require a more complicated intentional architecture. This is consistent with Beth Preston's (2021) views of our capacities of planning being developed on top of existing improvisational capacities that are of an earlier evolutionary origin and that we share with other animals. It also makes it clear why it is easier to define improvisation as a special case of planning than the other way around, for planning builds on and extends the more basic improvisational capacities and is conceptually more complex than improvisation.

Finally, one may think that talk about improvisation as "online planning" overemphasizes the role of planning and gives the impression that there is no room left for improvisation because all intentional activities are planned. After all, as Beth Preston (2021) suggests, the role of improvisation in our activities is much more important than the role of planning. This seems plausible since many of our actions are not planned in advance and even those that are leave some room for improvised action selection. However, if this worry is about

the use of words then perhaps we could as well talk about goal-directed or purposive activites in general and say that they can be divided in two broad classes: improvised activities and planned activities. The difference is only that "planned" now means only those actions that we would have said are "previously planned" or "planned beforehand", but the difference itself can still be drawn along the lines I've suggested: Improvised activities are such that their execution begins immediately once they have been chosen, whereas planned activities are those in which there is some time between choosing them and executing them, leaving room for reconsideration and possible revision. I'm not so much insisting on a particular terminology, but I want to suggest that the differences between the two types of action are primarily gradual and that even if we were to insist on a clear conceptual separation, real life is messier. Typically in any extended sequence of intentional actions there are elements of both planning and improvisation: Just as it is practically impossible to devise a detailed enough advance plan so that it could be executed without any responsiveness and adjustment to the particulars of the situation, it is difficult to engage in any extended improvised action sequence without mentally anticipating at least some steps ahead and making partial plans and preparations for various ways that the sequence may fold out.

6   Some consequences

Supposing that the proposal of improvisation as online planning is on the right track, it entails a rejection of the strict opposition between improvisation and planning. Instead, improvisation is a species of planning. This does not mean that there are no differences between typical cases of planning and improvisation; rather it means that the differences are mostly quantitative: Previously planned and improvised actions stand in the opposite ends of a continuum of intentional goal-directed, or purposive, activities. Improvisation is in the end of the continuum where the time difference between action selection and action execution approaches zero, whereas typical planning is in the opposite end in which there is sufficient time between action selection and execution to leave room for consideration of alternative courses of actions, and comparison, evaluation, and revision of candidate plans. In planned action as standardly understood, the plan execution phase starts only after the plan generation phase has been completed, whereas in online planning these

phases overlap, and actions are executed without them being fully specified in advance.

Another consequence of this conception of improvisation is that improvisation is *mundane activity.* It is not exceptional, nor is it something that only exceptional talents are capable of, even though in special domains such as musical improvisation, skillful improvisation naturally requires domain expertise and extensive practice. However, other domains may not be as specialized or as demanding. For instance, one may succeed in entering an improvisational flow state while cooking without a recipe. As said by Gilbert Ryle (1976, p. 69) on our innovative capacities: "What I am describing is not something that is peculiar to a few distinguished persons, but something that is shared in very different degrees, in very different forms, and with very variable frequencies by all non-infantile, non-retarded, non-comatose human beings." We engage in improvisation pretty much whenever we open our mouths to speak, and it does not necessarily involve anything mysterious. Whereas we may sometimes write speeches in advance and then either memorize them or read them out loud, more often we speak with only a more or less vague idea of the message we try to convey, and we will have to come up with the individual steps that aim at our goal during the execution: We will have to select the words and linguistic expressions, our tone of voice, gestures, pauses, etc. while we are already speaking, keeping in mind both the goal and the path taken so far, including the semantic content and the grammatical structure of the sentence we are currently formulating. Whatever we choose to say becomes part of what has been said and there is no possibility of revising the plan afterwards. Any corrections we make to what we have already said and done will become part of the performance. It follows that there is *some amount* of improvisation in most things we do, as few things can be fully planned in advance. This does not entail that all intentional actions count as improvisation: totally pre-planned activities (if there are any) are excluded and so is aimless fooling around.

The definition of improvisation as online planning allows us to define the two subtypes of improvisation mentioned earlier. *Planned improvisation* under this conception means filling in missing or under-specified subplans. This could also be called online plan refinement, or micro-improvisation. *Improvised improvisation* on the other hand can be understood as real-time planning or replanning initiated as a result of surprising change in the environment or other deviation from an earlier plan. This could also be called online plan

creation or revision, or macro-improvisation.

Not all surprising changes or deviations require immediate planning, and hence improvisation: Sometimes one may react automatically, instead, as in a reflex action, which is typically unintentional. In some cases, one may also automatically invoke a learned response or a pre-planned routine, like when one is about to lose the control of the car on an icy road. There is no time nor reason to improvise, rather just do what you have learned to do, instinctively perhaps, and correct the course of the car. Similar things take place in sports. For instance, a skilled football player has a vast resource of practiced series of movements that have become routine actions that are triggered quite automatically in the right circumstances without intentional planning taking place at the moment, even though it is, of course, part of the player's contingency plan to use all these resources whenever needed. Like reflexes, these routine actions cannot be called improvised if they are fully automatic, at least in my understanding of improvisation which is a creative process. However, a player may face situations in which he or she may have to very quickly come up with a plan intentionally, choosing from the repertoire of routine actions or combining several routine actions into a possibly novel sequence of actions, and such online planning should be seen as improvised, just like musical improvisation which also employs a reserve of highly practiced motor routines.

We can also view the definition from the opposite angle: Planning can be seen as improvisation augmented with an opportunity for revision. By looking at the matter from this point of view, we can alleviate the worries that our definition tries to reduce improvisation, which is understood as nuanced, flexible, and automatic, to hierarchically controlled, conscious, and mechanical planning. Instead one aspect of our idea is to view planning as a process that can involve largely the same elements that improvisation typically does. It, too, can employ flexible and unconscious processes in the creation of candidate plans. In fact, coming up with a plan seems like a creative process that is to a large extent improvisation itself. Apart from Artificial Intelligence, where planning is governed by an algorithm, planning itself, the creative process of coming up with a plan, is rarely planned in advance, but involves thinking and originating something new. "Originating is improvising", reminds Andrew Haas (2015) in his study of Aristotle's concept of improvisation. Plan creation is a process of originating, because it starts from scratch and ends up in a result, a plan that is supposed to solve a practical problem and lead to a

goal. Via imagination, plan creation can include improvisation-like selection of actions. In composing a musical piece or creating a dance performance, one may go with the flow and improvise parts as they come out in the moment of action and then later – maybe with the help of recording devices – adopt these improvised parts in the finalized plan to be publicly performed later. However, planning also includes the possibility to analyse, revise and replan these improvised parts in case there is room for improvement. The idea of a conceptual connection between improvisation and planning does not aim to reduce one to the other, but to suggest that they form a continuum where the same cognitive, bodily, and imaginative capacities are at play in both but with varying proportions.

The picture that emerges is that even though it may indeed be possible to make a conceptual distinction between them, it is extremely difficult to distinguish these two action types in actual practice, because a vast majority of our intentional actions fall somewhere in between, combining elements of planning and improvisation: Planned actions are rarely planned in enough detail to exclude improvisational elements in carrying out the plans, and improvised action sequences are very rarely completely novel (but include previously rehearsed routines as their constituents) nor completely spontaneous (but involve preparation and anticipation of future). Hence, instead of trying to keep planning and improvisation conceptually far apart from each other and to study each in isolation, it might be more fruitful to study them together and to understand them as sharing many features and employing many of the same cognitive, neural, and motor mechanisms that produce them.

7 Conclusion

We have studied the conceptual relations between improvisation and planning, and argued that improvisation can be understood as planning in which the processes of plan creation and plan execution are going on simultaneously. The connection between planning and improvisation seems be most clearly visible in situations of improvised joint action, targeted at satisfying a joint intention. Studying joint action was thus instrumental for arguing for the more general claim that improvisation is online planning also in the case of individual action. If the more general claim were disputed, it may still be

possible to defend the view that improvisation is online planning as far as joint action is concerned. The idea of improvisation as online planning is not new, but it has been discredited in the past, and its merits should be reconsidered. The view entails that planning and improvisation are not mutually exclusive ways of acting, but rather different points in a continuum of action types where the differences are gradual rather than absolute. Even though they can be conceptually separated, rarely if ever can our temporally extended sequences of actions be taken to be completely improvised or completely planned in advance. The view suggests a conception of improvisation as something that is present, to some extent at least, in most of our everyday activities, and hence should not be understood as something mysterious or exceptional, or a rare skill that only few can master.

Acknowledgements

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