



# A theory of co-production as joint household production with illustrations from the arts

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## Abstract

Co-production is prevalent in the arts but current usage of the term is loose and insufficiently grounded in economic theory. We propose a baseline theory of non-contractual co-production between producer and consumer, where we theorize co-production as a form of household production. In this baseline scenario, co-production is unproblematic because it is in the self-interest of both consumer and producer to deliver the required resources. From this baseline scenario we first relax the assumption of individual household production to analyze situations of joint co-production. The performing arts are an exemplary instance where audience members co-produce ‘the atmosphere.’ Jointness of consumption generates a collective action problem in co-production leading to the (potential) underprovision of (certain elements of) the co-produced good. We identify various market and institutional solutions which have emerged in the performing arts to prevent such underprovision. The second assumption we relax is that producer and co-producers agree on the desired characteristics of the good. We argue that a divergence in preferences in combination with other economic factors such as high fixed costs can explain the emergence of extensive co-production in fan-cultures. From this theory we develop various suggestions for the empirical study of co-production, especially how to explain success or failure of co-production. Although our analysis is restricted to artistic market goods, our framework has implications for the likelihood of co-production by citizens of public goods, which are typically characterized by both jointness of co-production and disagreement over the preferred characteristics of the good.

**Keywords** Co-production · Household production · Fan cultures · Artistic organizations · Co-creation

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## 1 Introduction

Co-production is of great relevance to the arts. Elements of co-production have been recognized across the process of production and consumption: from the inception of artistic ideas (Borowiecki, 2013; Cooke & Lazzeretti, 2008; Richardson, 2016), to financing projects (Lember, 2018; Leyshon et al., 2016), the user adaptation of products (Hippel, 2005; Luonila & Jyrämä, 2020; Voorberg et al., 2015), and the consumption of finished goods in, for instance, fan cultures (Booth, 2017; Choi & Burnes, 2013; Gamble, 2018; Jenkins, 2006). Co-production has also been promoted as a policy tool for citizen involvement in urban settings, frequently involving the arts (Loeffler & Bovaird, 2021; Moore-Cherry, 2017; Verschuere et al., 2012). Similarly, co-production has been studied as a superior form of consumption and engagement, engaging the consumer into an experience, or even inviting them into the creative process (Chang et al., 2021; Chathoth et al., 2016).

Despite extensive empirical research, there has been little theoretical work on why co-production is so prevalent in the arts. Why is it that artists, cultural organizations, and policymakers are keen to involve audiences as co-producers? Is it merely to save resources which they would otherwise have to provide themselves? Or is co-production a result of the intrinsic motivation of consumers? Or is it primarily driven by incentives from funders? Without a theory of co-production which explains why consumers are willing to contribute to a product, or why artistic organizations rely on it, such questions cannot be answered. More importantly, without such a theory we are dependent on purely inductive attempts to establish when initiatives which draw on co-production are likely to fail or succeed (i.e. Steiner et al., 2023).

An obvious solution to the conceptual confusion about co-production is to integrate it into economic theory. The most used definition of co-production only does so loosely. It claims that co-production occurs when individuals, groups, or organizations who are not part of the organization supplying the good contribute to the process of production and value creation (Alford, 2014; Davis & Ostrom, 1991). This definition has been criticized for being too all-encompassing. Therefore, this paper proposes a more substantive integration of co-production into economic theory, in particular with the theory of household production (Michael & Becker, 1973; Stigler & Becker, 1977). We start with a baseline scenario for co-production as household production which covers a (very) broad variety of cases in which consumers add something of value to the product, despite the fact that there is no contract between consumer and producer to do so. Consumers are motivated to co-produce, because the costs of this contribution outweigh the benefits. Producers rely on such consumer contributions, because consumers have some comparative advantage in the element of the good that is co-produced. The baseline scenario is less broad than the dominant definition because it clearly excludes contractual obligations and allows us to specify the precise conditions under which co-production at the interface between the firm and consumer is unproblematic.

From this baseline scenario we first relax the assumption of individual co-production in favor of joint co-production. This is of particular relevance in the analysis of co-production in the performing arts, which are jointly consumed, a concept defined

by Mancur Olson and Vincent Ostrom (Olson, 1965; Ostrom, 1975).<sup>1</sup> In situations of joint co-production each audience member is dependent on the co-production of other audience members. This can result in collective action problems that might cause underprovision or the breakdown of co-production. We subsequently identify market and institutional solutions that have emerged in the performing arts to prevent such underprovision. As such our paper improves upon the existing analysis of the production and co-production of the performing arts, a subject of increased relevance given discussions about the possible substitution of live performances with broadcasts (De la Vega et al., 2020; Gutierrez-Navratil et al., 2024; Towse, 2020). And the focus on joint co-production provides a clear explanation of why it might not pay for citizens to engage in the co-production of public goods.

Secondly, we relax the assumption that producer and consumers agree on the desired characteristics of the good. In any production process, coordination between the different inputs is required. Within a firm this is typically solved by a hierarchical structure and incentives to motivate agents to provide the relevant inputs (Williamson, 2002). But consumers as co-producers operate (largely) outside of the scope of control of the firm. In the case that preferences are heterogenous, consumers will seek to co-produce a different good than the artist or firm intended. Our theory explains why disagreements about the desired characteristics provides incentives for the emergence of co-production in fan communities (Marchenko & Sonnabend, 2024). We demonstrate why fan communities overcome the collective action problem involved in such joint co-production. We also believe it illustrates a key reason why co-production of public goods often fails: citizens do not necessarily agree with public providers about the relevant properties of the good.<sup>2</sup>

The more complete integration of co-production into economic theory has several distinct advantages. First, it enables us to answer question we posed initially: why is (joint) co-production more prevalent in the arts than in other sectors. Second, it demonstrates that successful co-production in situations of joint consumption relies on additional (market) institutions, of which we provide examples. Third, it allows us to specify the conditions under which co-production is likely to be underprovided or absent, an issue especially relevant for public policy. Fourth, as we demonstrate below, it allows us to make better empirical predictions about the success condition for co-production and its direction.

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<sup>1</sup>Jointness of consumption is different from non-rivalry often invoked in the welfare economics of the arts. Non-rivalry refers to the fact that one individual's consumption does not diminish the value for other, jointness of consumption refers to the fact that goods are consumed collectively due to characteristics of the good.

<sup>2</sup>In the public provision of services co-production has sometimes been proposed as a simple cost-saving measure. But as Kiser (1984) observed, it is not clear why citizens would contribute to public goods if they can free-ride. If that is the case, relying on co-production is at best a case of cost-shifting, and more likely implies a lower level of overall provision of the public good in question.

## 2 Co-production and the theory of household production

Elinor Ostrom defined co-production as “the process through which inputs used to produce a good or service are contributed by individuals who are not ‘in’ the same organization” (Ostrom, 1996, p. 1073). Even if we restrict co-production, as we do in this article, to instances of co-production between producers and consumers, this definition is not very specific. Alford adopted this definition to illustrate what fire prevention entails in a city like Melbourne. Fire prevention involves the Metropolitan Fire Emergency Services Board, the owners of the properties who notify them and install devices like smoke-detectors and small fire extinguishers. This seems fine, but then he goes on to include the following actors as co-producers of fire prevention: “telecommunications operators dispatching fire trucks expeditiously; road authorities constructing accessible streets; and water companies siting and maintaining fire hydrants” (Alford, 2014, p. 302). The inclusion of contractual relationships as part of co-production is not warranted, but Alford is certainly not the only one to do it.<sup>3</sup> In the creative industries, the term co-production has been used in this expansive manner in particular to refer to international contractual relationships between different film production companies (i.e. Parc, 2020).

This clearly cannot be what we mean by co-production, it is not a term meant to capture entire value chains or service networks. Such broadening is also not what Ostrom intended, her work is rooted in institutional economics which emphasizes the differences between contracts, firms, and other forms of (institutional) organization (Aligica & Boettke, 2009). When she imagined a relationship between two parties which are not in the same organization, she was referring to co-production outside contractual relationships (Paniagua & Rayamajhee, 2022). To further specify the definition, we should therefore make clear that the co-producer is not contractually compensated for its services.

This does not fully solve the issue. Even when we restrict ourselves to non-contractual forms of co-production, the phenomenon seems pervasive, as suggested by Agarwal: “would my printing a boarding pass at an airline kiosk or using the Internet to buy an airline ticket make me a co-producer in the transportation business? I hardly think so. However, in public service, beginning in public safety in the 1970s, we have taken a rather expansive view of the term” (Agarwal, 2013, p. 702). Brandsen and Honingh observe the same: “Daily teeth-brushing helps the dentist do his work and ultimately saves public money. Sucking a lollipop does the reverse. Whether it is useful to cover it all under the label of co-production is another matter” (Brandsen & Honingh, 2018, p. 11). It is correct that this is not necessarily helpful, because we should primarily rely on theoretical terms, like co-production, only when the phenomena cannot be explained with established theories.

But from the perspective of economic theory, in particular the theory of household production, it is a well-recognized fact that consumers buy goods on the markets as inputs to what they seek to produce. If you care about dental health, you buy certain

<sup>3</sup> Granted, Alford’s example is slightly more complicated, because a service like road construction is typically financed by public agencies. But co-production should not refer to the provision of goods or services of one organization as agreed upon through private or public contracts.

services from the dentist, but you also dedicate time and other resources to take care of your teeth. In their classic ‘*De gustibus non est disputandum*’ paper, Gary Becker and George Stigler discussed the aesthetic enjoyment of music, and suggested that music appreciation was produced through a combination of market inputs such as records, as well as the use of consumption capital (a form of human capital, relevant to appreciate music) (Stigler & Becker, 1977, p. 77–80). It is important to emphasize that when a consumer buys a novel, they understand they will have to provide the additional inputs of attention and time to read it. In other words, when purchasing a market good, consumers consider the additional costs of household production.

Co-production understood as household production makes clear that this form of production is complementary to firm production. Firms offer a variety of goods, which require more or less additional inputs (and human capital) before they can be enjoyed. Firms face a trade-off here, because they can provide a more comprehensive good or service which is more costly to produce, or they can provide a less comprehensive one and rely on the additional inputs of the consumer. In this conceptualization it is helpful to keep in mind the idea that goods are bundles of characteristics (Lancaster, 1971). Co-production means that both firm and consumer produce at least one of the characteristics of a good. The choice of how many of the characteristics are produced by the firm is a matter of strategic product design, in which the extent to which firms will make their service more comprehensive depends on the preferences of consumers, but also the resources available to households. If the consumer is in a better position to make the contribution cheaply, the firm is more likely to offer the less comprehensive service.<sup>4</sup> This might happen because the production of particular elements of the good are relatively costly to the firm because they lack the necessary skills or knowledge. Many products in the service industry, for instance, are customized in consultation with the customer. The knowledge provided in this process should be understood as co-production. Conversely, when the opportunity costs of time go up, consumers are less likely to engage in (extensive) co-production. The first implication of our theory is that co-production is more likely when households face lower costs than producers for the production of certain elements of the good.

The second step is to realize that most goods cannot be fully produced by the firm, so that some degree of household production is nearly inevitable. The extent to which such household production varies between types of products. Cultural and artistic goods frequently require significant additional inputs from the consumer. Typically, it is time-intensive to consume them, as in the aforementioned case of the novel. But as many cultural economists and sociologists have observed the enjoyment also requires previously investments in consumption capital, or cultural capital (Bille, 2024; Bourdieu, 1986). One reason co-production is pervasive in the creative industries is because consumers possess (unique) forms of cultural capital which gives them a competitive advantage in the co-production of certain elements of the product or experience.

This makes the household production situation between the artistic organization and the consumer similar to that between two firms in the following sense. Consum-

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<sup>4</sup>This trade-off is occasionally noted in the co-production literature, see for instance (Ostrom 1996, p. 1080).

ers buy goods on the market as inputs to what they seek to produce in the household and thus engage in the ‘make or buy’ decision familiar from industrial organization. From the perspective of the firm, the decision is to ‘make or rely on consumer co-production.’<sup>5</sup> Co-production, viewed this way, is another instance of specialization and division of labor. Such a division of labor between firms and co-producing households depends crucially on the resources available in the household and the firm, as well as the relative substitutability of the inputs provided by firm and household.<sup>6</sup> The second implication of our theory is that when consumers have already built up cultural capital, artists are more likely to rely on co-production, because production within the household is relatively cheaper.

The baseline scenario of non-contracted co-production within the household, highlights the fact that it will only occur if it is in the self-interest of the consumer. Consumers will not be interested in goods for which they do not have the skills to co-produce them, or when the opportunity costs of co-production outweigh the expected benefits. This will sound trivial, but our argument is that co-production becomes an economic problem, and therefore a theoretically interesting phenomenon, exactly when it is not in the self-interest of one or more of the parties involved. We believe that this simple fact has hardly been appreciated in the literature on co-production.

One might argue that by theorizing co-production as household production we too easily accept the self-interested individual of economic theory. Scholars of co-production have occasionally suggested that co-production happens due to the intrinsic motivation of citizens or consumers (Alford, 2009, p. 26–29). Our framework certainly allows for this kind of modification, but we believe that the problems we identify below occur both in the presence and absence of intrinsic motivation. The problems of joint co-production and disagreement about desired qualities are about the coordination of interests. And coordination problems occur wherever individuals pursue different ends (whether these are intrinsic or instrumental). Moreover, we believe that sustained cooperation tends to rely on solutions which draw on self-interest. To ensure sustained forms of co-production we should see institutional solutions which reward co-production of those who are not residual claimants (Pestoff, 2014). This is in line with the IAD-framework for institutional analysis as developed at the Ostrom Workshop (McGinnis, 2011; Ostrom, 2010), as well as the early theoretical explorations of co-production developed at the Ostrom Workshop (Kiser, 1984; Parks et al., 1981). In this approach it is assumed that behavioral motivations are broadly similar across different sectors of society and that institutional rules and frameworks are essential in steering individual self-interest toward solutions of collective action problems.<sup>7</sup>

<sup>5</sup> Kiser (1984) attempted to integrate this perspective into the theory of co-production. His efforts were focused on the co-production of public goods and services, but he failed to deal with the interdependence of the inputs of producers and consumers, thereby severely limiting the usefulness of his formulation.

<sup>6</sup> In the early development of the theory of co-production, the term interdependence was used to refer to the imperfect substitutability of the production of consumers and producers, whereas independence would refer to a situation in which there is a high degree or perfect substitutability between the two (Ostrom et al., 1978; Parks et al., 1981, p. 1003).

<sup>7</sup> Elinor Ostrom worked with a notion of rationality that was somewhat different from standard rational choice models (Ostrom 1998). One crucial difference was that she allowed for the possibility that insti-

### 3 Co-production in the arts

To identify situations in which co-production is not in the self-interest of the producer or consumer we must complicate our baseline scenario. As is well known, micro-economic theory relies on a wide range of assumptions regarding the divisibility of goods, individual motivation, information, expectations, externalities, etc. Each of these assumptions can be relaxed to arrive at specific applications of economic theory. We believe that two specific assumptions are of relevance to explain specific forms of co-production in the arts. The first assumption that should be relaxed is that the good is individually consumed. The social nature of consumption in the arts is well-established (Klamer, 2016; Potts et al., 2008). The so-called jointness of consumption is most evident in the performing arts, where an audience *jointly* co-creates the performance with the performing artist. To put that precisely, the audience co-produces the product characteristic ‘atmosphere’ which is an essential aspect of the live performance or show. Therefore, there is a collective action problem, in which it might be individually rational to abstain from co-production even if this means that the overall quality of the experience goes slightly down. This would happen when the individual marginal costs of co-production exceed the marginal benefit of co-production.

If artists realize this economic dilemma they might seek to expand the product they offer, by expanding the set of characteristics of the good they produce. Through light shows, dancers, and other devices a band makes significant *costly* contributions to the atmosphere. These additional elements never fully replace the need for co-production of the performance, but it might lower the costs of co-production sufficiently to escape this social dilemma.

Relaxation number two concerns divergent desired characteristics of the good. In this case, an economically relevant co-production problem arises because artists and consumers have heterogeneous preferences regarding the desired characteristics of the good. In such instances, consumers are motivated to co-produce (the marginal benefits of co-production exceed the marginal costs), but the type of co-production differs from what is expected and/or desired by the artist. When production happens within the firm, we think of such problems as principal-agent problems to be resolved through contracts. However, co-production at the interface between producers and consumers is non-contractual. We see fan production as the dominant mode of dealing with this social dilemma of preference divergence in the arts. Fan production is the production, through extension, expansion or alteration of the original product, typically for sharing with other fans. In this sense organizing fan production is itself a collective action problem, resolved within fan cultures.

One might well ask why markets do not provide a greater variety of goods, after all markets are supposed to coordinate supply and demand. This is a relevant objection, and we should therefore not expect co-production in fan cultures to appear for all products, it is especially likely to occur where products have high fixed costs such

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tutional solutions to collective action problems were developed within communities or markets, so that collective action problems were not necessarily tragedies, but could be turned into opportunities for collective action.

as films or tv-series in which producers cannot cater to niche tastes (Cowen, 1998). In such instances many specific combinations of demand are not met, but they can be catered for through co-production, assuming that co-producers face lower (opportunity) costs than the professional producer. Even so, co-production by fans faces economic challenges given that co-producers cannot market their spin-off creations under most copyright regimes. For the individual the private costs of co-production typically exceed the private benefits of co-production. This type of co-production is therefore only likely to emerge when there are non-market organizations, such as fan communities, which ensure that the private benefits of co-production increase.

Coordination problems around coproduction can result in suboptimal outcomes, typically called market failures. In the absence of institutional mechanisms which address these coordination problems our theory of co-production suggests that co-production is underprovided when:

1. Social benefit of co-production > social costs, but private benefits of co-production < private costs of co-production.

Our theory furthermore predicts that when there are heterogenous preferences situations can occur in which co-production is socially desirable but does not happen. This is the case when:

2. Private benefits of the firm of increasing product diversity < costs of increasing product diversity AND private benefits of co-production < private costs of co-production BUT Social benefits of production benefits of co-production > Private costs of co-production.

Suboptimal outcomes under both scenarios can be prevented when co-production is ensured through institutional mechanisms. Figure 1 traces the decision flow of (joint) co-production. The left-hand side of the diagram depicts the baseline scenario, where co-producing is in the interest of the consumer, and the right-hand side the relaxation of both assumptions, where co-producing is not necessarily in the self-interest of the consumer. We demonstrate this in further detail in the next sections, where we also discuss how our theory can be empirically operationalized to analyze the success or failure of co-production.

#### 4 Co-production and jointness of consumption

The performing arts are the most obvious example of jointness of consumption in the arts. Although there are small scale performances, such as living room concerts, typical concerts, plays, dance performances, comedy shows, and operas happen in front of crowds of considerable size. To the extent that individuals co-produce these performances, there is a potential free rider problem: consumers might fail to contribute to the atmosphere while enjoying the efforts of others to produce it. This could take the form of not engaging in interactions with the artist, not singing along, dancing or laughing when this is supposed to happen, or at classical concerts not helping to

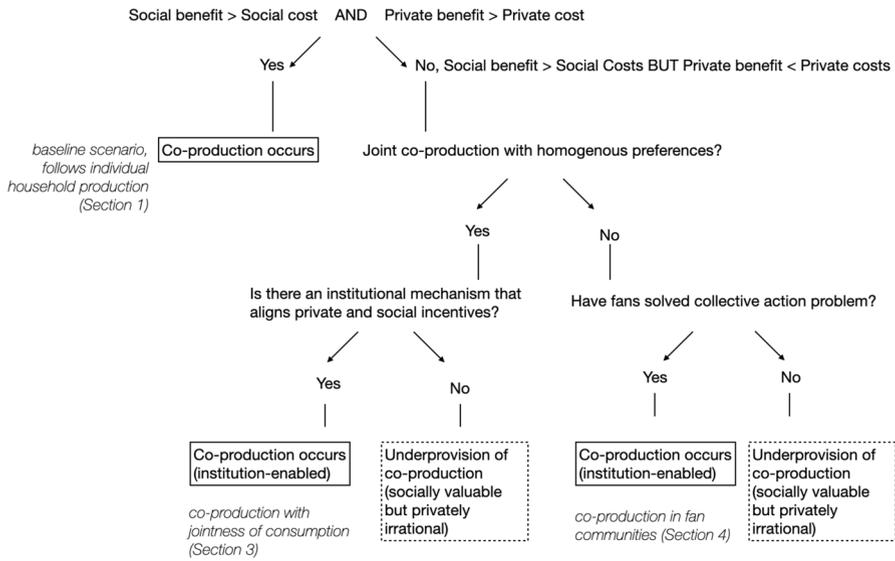


Fig. 1 Decision flow diagram for (joint) co-production

maintain the customary silence. In these cases, we can speak of an under-provision of the desired atmosphere, an important element of live performances.<sup>8</sup>

It is clearly in the interest of the artist that the crowd co-produce the performance. If this does not happen then the audience enjoys the good less, because it lacks at least one of the desired characteristics. The reputation of a performer will be hurt by the lack of crowd participation or engagement during a concert. Consequently, artists frequently decide to produce more of the ‘service,’ with light shows, costume-changes, stage props, or additional performers on stage such as dancers or ‘hype men,’ which are added to ‘get the crowd going.’ These are instances where firms decide to produce more of the total service and depend less on co-production. When they fail to get the crowd going with this more costly form of production the good might simply disappear from the market.

But the collective action problem of co-production in live performances does not necessarily have to lead to more firm production. It can also lead to the emergence of alternative solutions at the interface between the firm and the consumer. When the private costs of co-production exceed the private benefits for a significant share of the crowd, the atmosphere is underproduced. But it is worth emphasizing that this as

<sup>8</sup> One might perceive crowd participation more as a coordination problem, than an incentive problem. When it is mainly an issue of coordination, crowd participation is not itself costly to consumers, but individuals prefer to conform to the behavior of others. What is needed then is merely an initial spark, after which the co-production of the atmosphere becomes self-sustaining. This might be a useful simplification for some limited set of cases, but in most instances there is variation in the intensity of co-production both at the collective and at the individual level. When treated as a pure coordination problem it is hard to explain differences in intensity of co-production. Although not framed in these terms, the sociological theory of collective effervescence can be understood as a coordination problem explanation, since it suggests that crowds act as one (Tutenges 2021; Vandenberg et al., 2021).

undesirable for consumers as it is for producers. Each crowd member would be better off if co-production happens, but it is individually rational for crowd members not to do so. If this is a real problem, we should expect that both artists and consumers develop solutions to overcome this problem. These solutions are not uniform, but they typically consist of ways to increase the private benefits of co-producers.

The most incentive-compatible solution is the encore, the performance of some additional material at the end of the show. The encore is a reward for the co-production of the crowd, and its main (potential) benefit from the perspective of the artist is that it is a conditional reward. If the crowd co-produces it earns this reward, if it does not, it risks foregoing it. Obviously, this only works if the reward is genuinely conditional and does not become a standard part of the show. Ostrom spoke in this regard of the importance that participants could develop credible commitments toward each other: “so, that if one side increases input, the other will continue at the same or higher levels” (Ostrom, 1996, p. 1082). The encore is a credible commitment mechanism as these are defined by Douglas North (1993).

Another common phenomenon in the performing arts is the opening act. This is clearly not a conditional reward, but the opening act might help build an atmosphere of co-production. This is more likely in the interest of the opening act if they are paid by the firm producing the main performance (or if they are part of the same organization). In that case the main act has some control over the performance of the opening act and can direct them to incorporate elements specifically aimed at warming up the crowd (such as cover songs or call-and-response routines). If this is not the case, the interests of the opening act might lie elsewhere, for instance in establishing their own reputation or familiarizing the crowd with their (lesser known) repertoire. This illustrates that ensuring co-production is a question of the boundary of the firm. In certain instances, an act performing first might even wear out the crowd and make co-production for the following act harder, a clear case of rivalry between two firms.

Expanding the firm could happen in other directions. One could hire certain consumers on the condition they co-produce. Beginning bands frequently bring along some friends, who get in for free since they are on the guest-list, in the hope that they will co-produce. This points to the broader relevance of selecting one’s audience. Artists might, for instance, engage in attempts to sort the fans who attend their performances, by ensuring that the most enthusiastic fans can attend and occupy prominent places in the crowd. One way of doing this is by lowering ticket prices, which ensure that younger fans (with less income but more enthusiasm and willingness to stand in line) can attend. This reduces gross income for the performer but increases the quality of the experience for the entire crowd. It can be described as a form of screening, as that term is used in economics to refer to the selection of people on particular qualities (Spence, 1973).<sup>9</sup>

Another important mechanism is that of repeated interactions. One might expect that it is easier to generate patterns of co-production when there is a mutual expecta-

<sup>9</sup>Much less controversial is the idea that there would be payment of co-producers who help develop a product: freelance testers in the game industry are frequently paid and enjoy benefits such as early access to the product (Czarnota 2018; Straub et al., 2015). But using the term co-production for such payments seems unnecessary, since these are contractual agreements.

tion that a particular performance is part of a broader pattern of interaction between artist and consumers, or between members of a crowd. This is one reason why building a bond with fans is an indirect way of encouraging co-production. This broadens the idea of the encore and provides conditional rewards to repeat consumers. Again, the idea of screening is of relevance here, as it rewards specific loyal consumers. One obvious limitation of this strategy is that performing artists typically tour and thus do not play in front of the same crowd frequently.

But within the performing arts touring is certainly not the only mode of production. Theater companies and symphony orchestras are typically based in a particular city. They often rely on subscription models which ensure repeated interactions. In the related area of sports, home crowds are frequently very willing to contribute to the atmosphere. Among regular fans a division of labor in the co-production might be observed: fans who specialize in songs, props such as flags or attire, or fireworks. Many recurring (folk) art festivals, such as carnivals, revolve around this element of repeated interaction, and there we see an even more extensive division of labor of the co-producers. Because of repeat interactions, individuals start to act on long-term self-interest and are willing to reciprocate the efforts of others, while free-riding is more likely in one-off 'games' (Ostrom, 1998).

Given the benefits of repeated interaction, we should expect certain firms to specialize in this aspect. A comedy club or venue for popular music has a clear interest in successful experiences for both performers and consumers. Since such venues are in a particular place, it is likely that they have repeat customers, and they might therefore seek to stimulate co-production. One way of doing so is by providing additional services, such as drinks, which might stimulate the crowd to co-produce; various comedy clubs maintain a two-drink minimum. But there are also spatial components to what they offer. Venues play an important role in the staging as well as the seating (or standing) of the crowd. In their offerings we also see clearly that they recognize that consumers have heterogenous tastes, to which they respond by offering different kinds of experiences in various zones (at different price points). This offers the possibility of different experiences for those who differently value the interactive aspects of the performance, such as more involved forms of co-production in mosh pits right in front of the stage as opposed to assigned seats on a balcony, or the socializing dimensions of VIP-areas.<sup>10</sup>

A final institutional solution to ensure crowd co-production is the emergence of norms. It has been suggested that norms are a powerful way to overcome collective action problems when there are repeat interactions (Bicchieri, 2005; Ostrom, 2010). We believe that norms are particularly likely to emerge when there are negative externalities from the behavior of other audience members. The use of technology like smartphones is a commonly cited example which either distracts in theaters or blocks the views of the stage. Disturbing the silence commonly observed during classical music concerts and operas would be another example (Müller, 2014). Artists have responded by banning or even confiscating smartphones, although this is also driven by worries about digital reproduction. Artists do sometimes refuse to start

<sup>10</sup>To the extent that heterogenous experiences are possible there is less jointness of consumption. By unbundling of the good heterogenous experiences are made possible.

their performance, or interrupt it, when silence is not observed, thus attempting to ensure that audiences obey norms. But since other crowd members experience the negative externality, they are also likely to contribute to their enforcement, a dynamic which is harder to establish for positive externalities. Therefore, social norms among audiences are most likely to develop in the case of repeat interactions when negative externalities are involved.<sup>11</sup>

We can thus formulate the following hypotheses. In the presence of jointness of consumption co-production is more likely to succeed when:

1. Producers can develop credible commitments that reward co-production.
2. Producers can select audience members (screening).
3. When patterns of repeat interaction can be established between crowd members, or ideally between crowd members and performers this can ensure reciprocity and limit free riding.
4. Patterns of repeat interaction might give rise to norms of co-production, especially when negative externalities are involved.

To test whether credible commitments enable co-production, empirical work could focus on the introduction of explicit rewards (such as revenue-sharing, recognition, or exclusive access) to compare changes in co-production intensity before and after the introduction of incentives are announced. The effects of screening could be examined by comparing selective-admission events (e.g., residencies, member-only programs) with open-access events. To assess the effects of repeat interactions and test if they limit free riding, empirical research could use longitudinal participation data (e.g., subscription-based events or persistent online communities) and exploit exogenous shocks to interaction patterns. The effect of norms on co-production will require a combination of qualitative and quantitative analysis, but recent work has also explored the more experimental analysis of norm changes (Bicchieri & Dimant, 2025).

In existing empirical work on co-production in the arts, a theoretical foundation is often missing. This leads to studies that rely on inductive reasoning to understand what enables or hinders co-production, and sometimes even struggle to define it in first place. Thyne and Hede (2016) investigated what they call co-production in two museums in New Zealand, looking especially at how the museum managers incentivized visitors to co-produce their experiences. The researchers emphasized the crucial role of curators and guides facilitating the co-production processes, and their findings suggest that such efforts improved the user experience. The museums incurred costs in terms of extra staff and other tools such as audio tours to provide a more comprehensive experience. In this situation, co-production hardly seems an appropriate term to characterize the innovation, since museums seemed to have merely provided a more extensive service, thereby reducing the need for co-production by visitors. Kershaw et al. (2020) also analyzed co-production in Australian museums. They

<sup>11</sup> This advantage notwithstanding, we are aware that at the Concertgebouw in Amsterdam staff offered cough drops during the performance, and occasionally even asked coughers to leave the concert. An example of the venue incurring costs to ensure the co-production of silence.

claimed that museums carry out co-production instrumentally, to fulfill the requests of policymakers and ultimately to obtain more public funds. This might explain why co-production is sometimes used to describe changes to the product which actually lower the need for consumer co-production.

This is not to dismiss the idea that museums can stimulate co-production (at the request of policymakers). A related study looked at how various cultural heritage institutions in Australia have responded to a new type of consumer, who requires that the museums “move beyond the mere exchange of a pre-designed experience with consumers” (Minkiewicz et al., 2016, p. 755). To address this demand, heritage institutions have invited, engaged, and supported consumers to co-produce the museum experience, through practices of co-curation, and assisting visitors with the customization of their experience. It is an empirical question whether visitors appreciate this type of experience more than the previous service. But it is important to emphasize that co-curation would depend strongly on the inputs from a few visitors to the potential benefit of many others, a clear instance of the collective action problem we identified above. Our theory predicts that it would be hard to ensure valuable contributions to co-curation without credible commitments (or repeat interactions) between the museum and the co-curators. A more straightforward way might be to integrate these co-curators, temporarily, in the museum as compensated workers, rather than relying on co-production.

We discuss these examples to make clear that empirical studies of co-production must satisfy two criteria. First, it has to be determined whether the co-production is in the rational self-interest of the participants absent additional institutional mechanisms. In the scenarios discussed in this section we have argued that a prominent reason why this would not be the case is that it would be rational for (some) co-producers to free ride on the co-production of other consumers. When it has been established that co-production is indeed a genuine economic puzzle in this instance, and thus not in the self-interest of the co-producer, the analysis should proceed to a second step. Here the analysis would determine the presence of institutional mechanisms like the four we have identified in this section which could explain why co-production does or does not occur. In such studies success or failure can be measured by established criteria like revenues or customer satisfaction.

We have suggested that the performing arts are a type of cultural good in which joint consumption is part of the nature of the good. Studies of co-production in the performing arts would thus nearly always ‘pass’ the first step in a relevant empirical analysis which asks whether there is joint co-production. Whether this is also true for other artistic goods depends a lot on contextual details. But it has been rightly suggested that the consumption of all art has important social dimensions (Chang et al., 2021; Dekker & Morea, 2023; Potts et al., 2008) for instance because art experiences are enhanced by subsequent conversations about them. If these effects are indeed significant, then the collective action problem we have identified here is of broader relevance to studying art consumption.

## 5 Co-production with heterogenous preferences

In the model of household production discussed in the first section, individuals purchase market goods to realize their own goals. In the previous section we studied situations involving joint consumption, but we (implicitly) assumed that artist and consumers agreed on the desired characteristics of the product or experience. The second relaxation of our baseline scenario is the consideration of situations where consumers desire other characteristics of the good than the producer. Consumers as co-producers frequently alter or combine products and even engage in entrepreneurial efforts, sometimes defined as ‘user-innovation’ (Hippel, 2005). They might take co-production in directions not foreseen by the artist, motivated by the fact that they feel that the provided product or service did not have the desired characteristics. This can take the form of addition of new characteristics to the original product, or the adjustment of existing ones.

In a context of preference heterogeneity, typically assumed by economic models, we should expect the market to offer a diverse range of products. But the degree of product differentiation depends on the costs involved, in some goods there will be a nearly infinite variety, a characteristic sometimes associated with cultural markets (Caves, 2000; Hutter, 2011). But for other goods, like movies or tv-shows, high (up-front) costs means that actual variety is limited (Cowen, 1998). Consumers can accept this relative homogeneity of products, or they can decide to alter or expand the product so that it better fits their needs.

We believe that the decision to engage in co-production of this kind is what drives co-production within fan communities, such as fan-fiction (Jenkins, 2006, 2018). The dispersed nature of fan communities does not allow for comprehensive data on the extent of fan production, but both in pop music as well as in science-fiction and fantasy fan production it is incredibly extensive and sometimes overwhelms the official production of series like Star Trek, Star Wars, or Harry Potter. From the perspective of the firm, it is a question whether this kind of substitution is desirable. Firms are established because entrepreneurs think they can add value and believe there are profits to be earned. If fan production overlaps with the activities which add value and generate profits, then firms would not necessarily welcome this kind of co-production which competes with their own production. Artistic organizations have therefore frequently used the tool of copyright to prevent certain types of fan production (Liebler, 2015; Schwabach, 2016).

From the perspective of the consumer, one might well ask the question why fan production flourishes when the artistic firm already produces the good or service. The answer lies in the fact that fan communities produce material that is not necessarily commercially viable, because it caters to niche preferences. We therefore believe that fan production takes place when the opportunity costs of co-producers are lower than those of the producer. As Ostrom noted in her work on co-production, consumer production is more efficient when the opportunity costs of time are lower for the co-producers than for the firm (Ostrom, 1996, p. 1080). In this sense, amateur production might complement professional production.

But another possibility is that for some consumers the marginal benefit of co-production is relatively high. This can be the case when consumers have built up

significant product-specific consumption or cultural capital. Specific investments in this kind of capital happen quite naturally for long-running franchises, so it is there that we are most likely to see co-production in fan communities.<sup>12</sup> We can thus derive two important predictions about co-production in fan communities from our theory. Co-production in fan communities is likely to emerge when:

1. Fixed costs are high and product heterogeneity is limited.
2. Fans have developed franchise-specific consumption capital.

Some of the most extensive fan production exists around franchises such as Star Trek, include fanfiction, re-enactments, and comic conventions, where board games, tv shows, books, and literature are reinvented and expanded. In some cases, fan communities have managed to change the course of their favorite shows both in direction and in length. Fans for instance lobbied for a new season of Star Trek after the show was initially canceled (Geraghty, 2015). The initial fan productions around Star Trek were driven by the fact that the original series had not fully lived up to its promise to challenge the ‘white history narrative’ (ibid, 73). In this sense, co-production in fan communities provides both quantitative and qualitative feedback about the quantity and type of product which is desired by (certain) consumers.

Thus, fan production can function as a signal that demand is (still) present but remains unmet, causing a deadweight loss. The firm could produce more material. The recent developments in the film and streaming industries indicate that firms are realizing the relevance of specific cultural capital in driving future consumption, and hence we are seeing many films and series expanding upon earlier franchises. Disney, which has acquired the rights to Star Wars, is now regularly producing new spin-off series, video games, costumes, and board games, thereby internalizing in the firm what for a long time was done in fan communities (Proctor, 2013).<sup>13</sup> In doing so it could rely on the knowledge generated through fan production which provided signals about which kind of content was likely to be valued. It is likely that such spin-off materials benefit from lower costs and new distribution channels such as the Disney + streaming platform. This makes it possible to create more variety in an industry, formerly characterized by higher costs of production and distribution.

Yet, firms might not always want to tap into this unmet demand. In manga fan fiction there is for instance space for homo-erotic narratives, sometimes involving underaged characters (Zanghellini, 2009). Commercial firms typically seek to avoid storylines which strongly challenge existing moral beliefs, because they fear that it might alienate mainstream audiences and harm their brand. In these instances, fan production is better understood as a form of product differentiation which is not (yet) commercially viable, geared toward underserved niche markets. This will probably not lead the incumbent firm to internalize this kind of production, but it might stimu-

<sup>12</sup> Another important factor is that fan communities themselves need a critical mass to sustain themselves, so they are more likely to emerge alongside popular franchises than for niche products.

<sup>13</sup> Disney has a history of controversy for the way it has cracked down upon reuses of its characters in fan production (Wasko 2020, Chap. 8).

late new artistic firms to enter these niche markets. Again, this kind of feedback dynamic is a good reason to value fan production from an economic point of view.

Fan production is clearly not individually rational in a simple sense, it suffers from a collective action problem like the one outlined above. Fan-fiction, or related material, is (very) costly to produce, while the benefits accrue mainly to other fans, rather than the co-producer of the fan fiction. But quite universally fan communities have managed to overcome this collective action problem by crowding-in contributions and facilitating sharing. In the case of Star Wars, fan fiction is exchanged on *Storium*, a bottom-up platform accelerated by a Kickstarter campaign, on which fans can share their fictional writings, using existing characters to explore uncharted lines of the grand narrative (Booth, 2017). These communities tend to operate according to the logic of the (cultural) commons (Dekker & Kuchař, 2021; Hess, 2012). As one would expect in a knowledge or cultural commons, contributions are central to sustaining the practice, and fans move up in their social standing in the community if they are able to contribute more (Rennie & Potts, 2024).

Fan communities can be added to the list of four institutional solutions ensuring co-production identified in the previous section. They achieve their success by building communities with internal rules and ensuring that patterns of repeat interaction are established and norms of reciprocity can emerge. But instead of largely originating from the producer, fan communities originate from the initiatives of the consumers (as co-producers). These communities with structured rules about the type of contributions and norms for sharing, manage to increase the private benefits of being part of such co-productive communities.

In existing empirical studies of fan communities, the economic dimensions of co-production are typically only in the background of the analysis, but they can be discerned. Idema has studied what happened during the Covid-19 pandemic, in the visual arts. He documented the social-media challenge to create a photo of one's favorite painting. Audiences, locked up in their homes, dressed up and changed their living room into the décor of an iconic image (Idema, 2020; Dekker and Morea 2023, p. 78–79). But he recognized that not all co-production of this kind is invited or appreciated by museums. Some museum visitors took pictures while touching artworks or used social media posts to critique pieces of art which they regarded as misogynist or racist. Museums have not stood by helplessly. Once the demand for artistic photography publishable on social media became apparent, both existing and new museums adapted to the trend and have provided spaces uniquely dedicated to social media content creation (Bollati et al., 2024; Rhee et al., 2021). This is a good example of how co-production can signal demand for a new type of product.

Empirical studies of co-production in fan communities in line with our theoretical framework can take two forms. First there is the more qualitative question of whether it is indeed true that co-production of additional material is driven by divergent preferences about the desired characteristics of the good. The existing studies of fan production from Star Trek consumers provide a good example where this is the case, but it is an empirical question whether this is a necessary condition. In this context, however, it is important to recognize that divergent interests between producers and consumers have also been studied in the literature on crowdfunding: the practice of collecting funds from a dispersed group of backers, and involving them in the early

stage of an entrepreneurial project (profit or nonprofit) (Dalla Chiesa, 2020). Chaney (2019) has argued that crowdfunding in the arts can reverse the principal-agent relationship between consumer and artists. In his reconceptualization backers become the principal of the relationship because they have clear ideas and expectations about the content of the projects they wish to support. He concluded that crowdfunding is not about the emancipation of artists from traditional gatekeeping structures, but about consumers having more control over what type of art gets produced. Empirical studies should therefore be open-minded about other potential ways in which niche consumer preferences and feedback might be incorporated into the development of new artistic goods.

The second question concerns the success or failure of co-production of additional material. It is our contention that significant additional material will only be co-produced if (fan) communities manage to solve the collective action problem involved in the co-production of such additional material through alternative (commons) institutions. Empirical work should study the relative success of such communities using established frameworks for institutional analysis like the IAD-framework (McGinnis, 2011). In such analysis there is particular attention to the rules by which communities organize themselves.

## 6 Conclusion

In this paper, we have argued that co-production has been used indiscriminately in the discourse on the arts, and beyond. We have defined co-production as a form of household production, which in our baseline scenario is directly in the interest of the consumer as co-producer because the benefits accrue to them. We have provided two scenarios in which co-production is (more) interesting for cultural economists, because it is not directly in the self-interest of actors to engage in co-production. The first scenario is one in which the product is consumed jointly, such as in the performing arts. In the case of joint consumption the individual costs of co-production might exceed private benefits. In these situations, there is a collective action problem, in which everyone would be better off if co-production occurs, but where it is individually rational to abstain from co-production. The second scenario arises when consumers wish to develop the product or service in a direction different from what the artistic organization intended. In such cases, the costs for the firm of producing more variety exceed the expected benefits. This is true for co-producers as well, but consumers may activate communities of user innovation outside the scope of the firm. Firms will only allow (or encourage) such community production when it is not perceived to harm their business model or reputation.

We have suggested that jointness of consumption, one of the main reasons for co-production, is prevalent in the arts, especially the performing arts. But as noted, the social dimension of art consumption has been highlighted by economists and sociologists of the arts, which suggests that the dynamics we analyzed for the performing arts might have much broader relevance in the arts. Another clear extension of our analysis of the problems associated with joint co-production would be experience

goods, for which producers can at best stage the experience and consumers have to engage in order to complete the experience (Pine & Gilmore, 1999).

We have focused our attention on co-production between producers and consumers in commercial settings, to develop a basic theory of co-production. Co-production is also frequently promoted as a tool in public policy, and various public goods depend on co-production as we have defined it here. Public goods and services interestingly are often characterized by the two characteristics we have identified here as potentially leading to problems for co-production. Public goods are typically jointly consumed, and there is often disagreement about the desired characteristics. We should thus expect that citizens are likely to free-ride on the co-production of others in the absence of additional institutional mechanisms. And we should also expect that citizens will develop the resources provided by (city) governments in unexpected ways to better suit their individual or community preferences. Such adaptations of public goods might well happen in what are considered undesirable directions.

Since co-production happens outside of contractual relations, it is hard to control the direction of co-production. But alternative institutional solutions are possible which both crowd-in contributions, and which might help negotiate conflicts of interest over the direction of co-production. In this sense a theory of co-production as household production can contribute to more successful co-production initiatives. We have identified several institutional solutions which might ensure co-production also happens under more challenging circumstances. Future empirical work can test the (relative) importance of these institutional solutions, and should analyze the emergence and functioning of these and other institutional solutions. This should help solve the problem that many empirical studies struggle to explain why co-production fails or succeed.

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## Declarations

**Conflict of interest** The authors declare no conflict of interest.

**Ethical approval** This research did not involve human participants or animals, and thus did not require ethics approval.

**Ethics and integrity policies** This manuscript adheres to the ethical standards of academic research and publication.

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