

Article

Algorithmic Gestation: Inference, Stages and Prescription in the Organisation of Biographical Time

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Abstract

Algorithmic personalisation holds a central place in platform studies, where it has been described as the outcome of classification, profiling and adaptation to inferred preference. That vocabulary proves insufficient once what the system attributes is no longer a stable property of the subject but a condition with a beginning, an internal articulation into stages and an end, since the platform must then hold a model of how the attribution will change and distribute content in accordance with it. My focus falls on this form of temporal organisation, and I develop the concept of algorithmic gestation through five jointly necessary features: inference of an emerging biographical state, stage-sensitive temporal sequencing, progressive stabilisation of an algorithmic identity, anticipatory presentation of practices and needs, and normative prescription indexed to the projected trajectory. The argument rests on a nine-month digital autoethnography carried out during my own pregnancy, in which I documented the reconfiguration of an Instagram feed, and it sits within a feminist STS genealogy that treats obstetric visualisation, prenatal diagnosis, self-tracking and intensive mothering as layers which accumulate rather than succeed one another. The material proves consistent with four of the five features and required revision of the fifth, since stabilisation of identity appears to operate as subordination of earlier configurations rather than as their replacement. I argue that algorithmic inference constitutes the most recent layer of reproductive governance, set apart by the absence of a threshold, by the absence of disclosure and by its address to a subject identified in advance of any account she gives of herself, and that platform power extends beyond the management of visibility to the organisation of biographical time.

Keywords: algorithmic gestation; anticipation; feminist STS; reproductive governance; platform temporality; digital autoethnography



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1. Introduction

Platform studies has given a precise account of how recommender systems order, classify, filter and personalise content, and of how the categories they assign acquire social force [1–5]. This literature clarifies what a platform displays and on what basis, while leaving in shadow the operation performed once the attributed category ceases to be a stable property of the subject and becomes a phase. To attribute an interest in running is to advance a claim about a disposition, and such a claim implies no terminus; to place a user at the eighth week of gestation is to advance a claim about a position within a process, a claim that entails an antecedent state and a consequent one, hence an order in which content will have to follow. Available concepts account for the discrete output and not

for the sequence. Personalisation is retrospective in its temporal structure, profiling is temporally flat, targeting designates an address rather than an order, and anticipation, in its canonical formulation [6], names an orientation towards the future without specifying the mechanism through which a future is decomposed and delivered. My focus falls on that mechanism, which I call algorithmic gestation and define through five features that must hold jointly: inference of an emerging biographical state; stage-sensitive temporal sequencing; progressive stabilisation of an algorithmic identity; anticipatory presentation of practices and needs; normative prescription indexed to the projected trajectory. A definition of this form makes it possible to specify what would not count as an instance, which is what keeps the concept from expanding into a synonym for longitudinal personalisation. Alongside the definition, I state the conditions a biographical situation must satisfy for the concept to apply, and I identify situations that fail them. The argument sits within a feminist STS genealogy of reproductive governance, which precedes the construction of the concept in the order of exposition. Reproduction has been an object of technoscientific knowledge for over a century, and the disciplines concerned with it acquired jurisdiction over it within economies that funded them [7,8]. Feminist scholarship has since reconstructed how successive technologies rendered the pregnant body legible, and to whom. Obstetric visualisation produced a foetus separable from the woman carrying it [9,10]; prenatal diagnosis reconstituted pregnancy as a period of suspended judgement organised around risk [11,12]; self-tracking moved monitoring from the clinic to the device carried by the person monitored [13,14]; the ideology of intensive mothering supplied the normative content that each of these layers conveys [15,16]. A nine-month digital autoethnography anchors the argument, and it did not begin as research. In April 2025, after a handful of Google searches concerning a pregnancy test and the reading of beta-hCG values, my Instagram feed started presenting content addressed to a pregnant person. I had told no one, and on the platform I had run no search, pressed no like, followed no account, and saved no post relating to pregnancy. Over the weeks that followed, the feed kept reorganising itself around a condition I had not declared, and the correspondence held not to pregnancy in general but to the week I was in. Recognising that the system was attributing that condition to me made perceptible an operation that ordinarily stays in the background, and turned a private disorientation into an object of analysis, along lines that the literature on algorithmic awareness has documented in relation to unexpected or uncannily pertinent outputs [17,18]. The material proved consistent with four of the five features and forced a revision of the fifth: stabilisation of an algorithmic identity appears to operate as subordination of earlier configurations rather than as their replacement, since prior interests resurface rearticulated within the frame of pregnancy and come to dominate again after birth. Read against the genealogical background, algorithmic inference proves less unprecedented than it appears, and departs from that background in three specifiable respects. Entry occurs without a threshold, the calendar goes undeclared, and the address falls on a subject the system has identified rather than one who has presented herself. On this basis I argue that platform power extends beyond the management of visibility to the organisation of biographical time, and that algorithmic inference constitutes the most recent layer of an apparatus that remains at once clinical, visual, quantified and commercial. A second contribution concerns the conditions of research in this area. The visual corpus on which the analysis rests cannot be reproduced: journal policy on copyrighted material, together with the legal status of the content itself, prevented its inclusion in any form, anonymised versions included. Research on platform environments already labours under the withdrawal of access, the closure of data-sharing programmes and the legal exposure of independent auditing [19–22]; copyright operates as a less discussed member of the same family, since it does not prevent research but prevents the demonstration of research. An

asymmetry follows that deserves naming: the platform may observe continuously and retain indefinitely, while whoever documents what was delivered to her cannot exhibit the documentation.

Section 2 reconstructs the genealogy of the layers of reproductive governance within which algorithmic inference takes its place. Section 3 defines algorithmic gestation, delimits it against adjacent concepts and states its scope conditions. Section 4 describes the materials, clarifies the status of digital traces and reports the composition of the archive. Section 5 reconstructs the path by which the five features were abstracted from the material and isolates the point at which the material forced a correction. Section 6 discusses the results, addresses the evidentiary constraint, and concludes the paper.

2. Layers of Reproductive Governance: A Feminist STS Genealogy

To claim that algorithmic systems take part in the government of reproductive life holds interest only once that participation is placed within a longer history. Reproduction has been an object of technoscientific knowledge for well over a century, and feminist scholarship has reconstructed with precision how successive technologies rendered the pregnant body knowable, and to whom. Presenting platform inference as an unprecedented intrusion into an otherwise private domain would misdescribe the domain along with the intrusion. What follows sets out the layers to which algorithmic inference is added, before specifying its contribution, and it proceeds from a definite claim: those layers accumulate; they do not supplant one another. Algorithmic inference is the latest arrival in an apparatus that remains at once clinical, visual, quantified, inferential and commercial. A pregnant woman in Italy in 2025 is subject to all of it, often within the same afternoon. Oldest among the layers is the visual one. Petchesky's analysis of foetal imagery established that obstetric ultrasound did not make visible what had been concealed but produced a new object with a political life of its own: a foetus separable from the woman carrying it, available for public circulation and for claims advanced on its behalf [9]. Duden extended the argument historically, showing how the pregnant woman's testimony about what she felt came to be displaced by images that others read more authoritatively than she could [10]. Knowledge arising from within lost authority to what the technician saw from outside. Martin, through her analysis of medical metaphors of the female body, and Balsamo, through her work on the technologies by which gendered bodies are produced, place this displacement within a wider reorganisation of women's embodied knowledge around representations they do not control [23,24]. Haraway's critique of the visual regime of late twentieth-century biomedicine supplies the epistemological argument that holds these contributions together: the seemingly transparent image is the product of an apparatus that fixes both what may be seen and who occupies the position of seeing [25,26]. This layer has not receded. Ultrasound remains central to the clinical management of pregnancy; its images circulate on platforms as announcements, and the visual conventions established in the clinic reappear in the illustrated content that platforms distribute. A probabilistic layer settled over the visual one. Rothman showed how prenatal diagnosis reconstitutes pregnancy in a form she calls tentative, suspended in judgement until results arrive and lived as provisional throughout that interval [11]. Rapp's ethnography of amniocentesis examined what such suspension demands of women, whom her analysis describes as moral pioneers called upon to decide first, on the basis of statistical information about a foetus they cannot yet know [12]. Risk became the medium through which experience was organised, and its management a maternal responsibility. The institutional conditions that made this possible emerge from Clarke's history of the reproductive sciences, which reconstructs the constitution of reproduction as a scientific object and the jurisdiction acquired over it by the disciplines that studied it [7]. The account of biomedicalisation

developed with Shim, Mamo, Fosket and Fishman then described the wider transformation by which health ceased to be a state to be restored and became a project of optimisation, distributed across everyday life rather than confined to clinical encounters [27], while Murphy's work on the political economy of reproductive technoscience establishes the inseparability of these arrangements from the economies that fund and market them [8]. What matters here is the temporal feature. Diagnosis introduced a structure in which pregnancy is scheduled: particular weeks acquire particular significance, certain knowledge becomes available at certain points, and the woman is required to be ready for each of them. The gestational calendar we recognise in pregnancy content is a clinical artefact that platforms have inherited. More recent, and quantified, is the layer that the monitored person administers to herself. Lupton has documented, in work on self-tracking and dataveillance, the transfer of monitoring from clinical settings to the devices we carry, together with the reconstruction of self-knowledge in terms of data [13,14]. Within the reproductive domain, research on pregnancy applications has shown how these tools bring together informational address, risk management, and consumption, supplying week-by-week guidance that renders the user responsible for outcomes presented to her at the same time as uncertain [28]. Barassi takes the argument to the point of greatest relevance here, demonstrating that expecting parents become subjects of data collection long before a child exists, and that the resulting profiles are assembled across commercial infrastructures rather than within any single application [29,30]; Leaver establishes the continuity between prenatal and postnatal monitoring [31]. Temporal organisation becomes explicit at this layer, since an application delivering weekly content organised by gestational stage already performs stage-sensitive sequencing. What sets it apart concerns address and consent: the application was installed, and its calendar is declared. Running through all these layers is a normative content with a history of its own. Intensive mothering, in Hays's account, is an ideology that demands child-rearing which is expert-guided, emotionally absorbing, labour-intensive and financially costly, and that places such demands specifically on mothers [15]. Douglas and Michaels reconstructed its media dissemination and its hardening into a standard no actual mother meets [16], while later research has examined how digital environments extend and complicate those norms by multiplying sources of advice and by making maternal performance public [32]. Two features bear on my analysis. Intensive mothering prescribes conduct and affect together, requiring that the labour demanded be experienced as fulfilling; and it is anticipatory in its own right, since the competent mother is expected to have informed herself, to have read, to have purchased and to have arranged. An ideology so constructed attaches readily to a technology that delivers instruction ahead of need. One delimitation applies: not every item of pregnancy-related content enacts intensive mothering. Informational material on foetal development, clinical advice on symptoms and product recommendation differ from explicit prescription about what a good mother does, and I confine the intensive mothering reading to material of that latter kind. Placed against this genealogy, algorithmic inference is neither a rupture nor a simple continuation. Three differences carry analytical weight. The layers described are entered, since a woman attends a clinic, consents to a test, installs an application, reads a magazine; algorithmic inference operates without an equivalent moment of entry, and content addressed to a pregnant subject appears within an environment used for unrelated purposes, on the basis of an attribution the subject neither performed nor can inspect. What was a threshold has become a condition of the environment. Disclosure is likewise missing: the clinical calendar is public knowledge and a pregnancy application announces its own as a feature, whereas the sequencing I describe goes unannounced, cannot be consulted and will not be suspended. The subject encounters it as a series of individually unremarkable outputs whose order becomes perceptible, if at all, in retrospect. The third

difference lies in the direction of address. Prenatal diagnosis addresses a woman who has presented herself for testing; algorithmic inference addresses a woman identified as probably pregnant, so that the address precedes and helps constitute the identification it presupposes. Content arriving ahead of any disclosure, and in certain cases before the pregnancy has been confirmed to anyone, does not inform a subject of her condition. It positions her within it. None of this supplants what came before. The clinic goes on visualising, diagnosis goes on producing probabilities, applications go on counting weeks, and intensive mothering goes on supplying the normative content that all these layers convey. Algorithmic inference joins the apparatus and, as an ambient presence, is the layer hardest to leave.

3. Algorithmic Gestation: Constituent Dimensions and Conceptual Boundaries

The layers just described share a temporal structure that none of them thematises. Before naming the operation by which algorithmic inference inherits and transforms that structure, I need to show what analytical work the existing vocabulary fails to perform. Personalisation, profiling, targeting, predictive analytics and anticipation cover much of what platforms do, and the question of what falls outside them deserves an answer before any empirical material comes into play. I do not claim that platforms perform an operation hitherto unobserved. My claim is that a definite combination of already described operations produces an effect none of them, taken singly, manages to name, and that the effect concerns the organisation of time more than classification. A discrepancy between how algorithmic systems are described and how they are encountered provides the starting point. It is well established that recommender systems order, classify and filter by inferring attributes from behavioural data [1–4]. That literature accounts for a system answering the question of what to display, and far less for a system that appears to answer the question of what comes next. A feed presenting material on early gestational symptoms, then on foetal development, then on preparation for birth, then on postnatal bodily recovery, and doing so in an order that follows the unfolding of the condition, performs something in excess of repeated classification. Selection concerns the single output; the order in which outputs succeed one another is a distinct phenomenon. None of the available concepts covers that order, though each illuminates an aspect of it. Personalisation concerns the adaptation of content to inferred preference, and its temporal structure looks backwards, since past behaviour supplies the evidence from which present relevance is derived: a personalised system working to perfection would show a user more of what she has already shown an interest in, not what she has yet to need. Profiling works instead by shared attributes, assigning users to categories which, as work on algorithmic identity shows, acquire autonomous force and become the terms in which the subject is addressed and understood [33]. Those categories carry no expiry, though: a user classified as an expectant mother keeps the classification until new evidence revises it, and nothing in the concept accounts for an attribution due to lapse on a schedule and to be succeeded by another in a set order. As for targeting, which delivers commercial messages to users selected by inferred attribute and has long found its canonical illustration in pregnancy, it describes the address of a message to a recipient and says nothing about the arrangement of several messages into a sequence whose order carries meaning. Closer still, and calling for greater care, is the anticipation of Adams, Murphy and Clarke [6]. Their account describes a regime in which the future is made present as an object of calculation and obligation, in which acting well consists of acting ahead, and in which uncertainty about the future generates duties in the present. Everything I examine here takes place within that regime, and I have no wish to position myself outside it. The difficulty lies elsewhere: anticipation names an orientation,

not a mechanism. It establishes that the future has become operative in the present, leaving open the question of how a future comes to be decomposed, distributed and delivered. Algorithmic gestation names one of these modes of delivery. Where anticipation describes the temporal disposition of technoscientific modernity, algorithmic gestation describes a definite arrangement in which a projected trajectory is segmented into stages and returned to the subject at a pace that follows the condition as it unfolds. The relation between the two terms is one of specification rather than competition. I take as settled that probabilistic inference constructs the futures it claims to foresee [34,35]; what warrants attention is what happens after the prediction, when the prediction does not stay with the system but is returned to the subject, in instalments, in an order mirroring the shape of the life it predicts. That return takes its full form where five features hold jointly. What follows serves as a definition rather than as a description of typical cases, with the consequence that the absence of a single feature places the phenomenon outside the concept; Figure 1 represents their articulation.

Algorithmic gestation: constituent dimensions

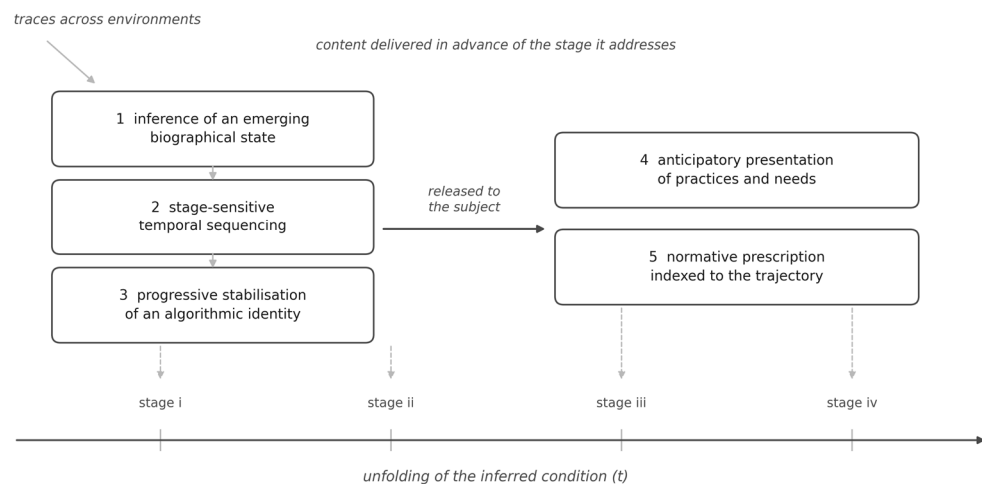


Figure 1. The five constituent dimensions of algorithmic gestation and their temporal articulation. Dimensions 1 to 3 concern the construction and consolidation of the attribution; dimensions 4 and 5 concern its return to the subject. Dashed lines indicate delivery in advance of the stage the content addresses. Grey arrows indicate the sequence of operations through which the attribution is built; the black arrow indicates the release of sequenced content to the subject.

An emerging biographical state is inferred first. What the system attributes is neither a preference nor a taste nor a demographic property, but a condition with a beginning: something the subject has entered, not something the subject is. The distinction matters because attributing a disposition carries no expectation of a terminus, whereas attributing a position within a process implies a prior state and a subsequent one, and thereby gives the system something to sequence. Stage-sensitive temporal sequencing follows, treating the inferred condition as internally articulated and distributing content in accordance with that articulation. Here the distance from personalisation grows sharpest, since what the system requires is a model not of what interests the user but of how the condition attributed to her is set to develop. Such a model need be neither explicit nor accurate; it need only prove operative in the order in which things appear. A third operation stabilises an algorithmic identity by degrees. Early on the attribution stays provisional, and content is mixed, hedged, in part inconsistent with itself. Consolidation then sets in: competing material recedes, and the subject is addressed with growing univocity. The fourth dimension concerns the moment at which practices and needs are presented. Content arrives ahead of the need it answers, and this precedence constitutes the operation rather than a side effect of it. A

recommendation answering a question already formulated proves useful; one arriving before the formulation may take part in forming it. The subject meets her prospective concerns in the shape of material addressed to her present. Normative prescription indexed to the projected trajectory enters last. The sequence does more than inform: it specifies what to do at each stage, what to feel, what someone competent in that position does next. Prescription is what distinguishes a schedule from a calendar, since the calendar locates the subject while the schedule states what is expected of her there. On commercial platforms such prescription routinely takes the form of an invitation to purchase, and in the material examined here the two can rarely be told apart. The feature is defined, however, by the normative content of the address and not by its commercial vehicle, for reasons set out below. Taken singly, none of these dimensions is unprecedented. Their conjunction describes a system that does not classify a person and then serve her, but builds a trajectory and walks her along it. For the concept to travel beyond pregnancy, the conditions under which it applies require statement, failing which algorithmic gestation collapses into a synonym for longitudinal personalisation. Three strike me as necessary. The situation must possess a culturally codified stage structure, that is, a shared account of what its phases are and in what order they follow, without which nothing exists for the system to sequence. It must possess a recognisable onset, since a condition that cannot be dated cannot be located. And it must be articulated into stage-specific practices and resources, in the sense that distinct forms of care, expertise, goods and services attach to distinct phases: such articulation supplies the material to be distributed and gives each stage something to prescribe. In platform environments the articulation is overwhelmingly commercial, and commerce also supplies the incentive to distribute the material in order. The condition concerns the articulation, though, not its commercial form. Pregnancy satisfies all three conspicuously, and this is what makes it a strategic case rather than merely a personal one. Its stage structure is codified to the week, its onset is marked by a test, and an industry organises itself around each trimester. Other situations satisfy them to varying degrees. Bereavement possesses a codified stage structure and a datable onset, and funeral services, counselling and religious practice attach distinct resources to its phases, though the later ones are segmented less finely. Migration, retirement, marriage and the purchase of a first home satisfy them in part. Chronic illness often lacks a stable stage structure and a datable onset alike, and the concept applies to it poorly; the same holds for ageing, whose onset admits of no location. Stating the conditions in this form renders the concept refutable, which is the point of stating them. A situation exhibiting all five constituent dimensions while lacking a codified stage structure would count as evidence against the conditions proposed. The case binds together what the concept requires and what pregnancy on a commercial platform happens to exhibit, and the two need separating. Commerce is not among the constitutive features. The comparison drawn in Section 2 settles the point. A pregnancy application is itself a commercial product, and it performs stage-sensitive sequencing and normative prescription; it nonetheless falls outside the concept, because the condition it addresses has been declared by the user rather than inferred by the system. What excludes it is the first feature, not the presence or absence of commerce. By the same reasoning, a system with no commercial interest (a public health service inferring pregnancy from search behaviour and sequencing advice accordingly) would satisfy all five features and fall within the concept. Commerce belongs instead to the explanation of why the phenomenon arises on platforms as they are presently organised: it furnishes much of the stage-specific material in circulation, together with the incentive to deliver that material ahead of need. Whether normative and commercial prescription necessarily converge on platforms is an empirical question the concept leaves open, and one the discussion takes up. Two implications remain to be specified, and they follow from the argument rather

than qualify it. Algorithmic gestation describes an observed pattern in the distribution of content and advances no claim about the architecture producing it. Nothing in the concept requires a platform to hold an explicit model of gestational stages, or any single system to be responsible for the sequencing. The ordering may emerge from the interaction of advertising categories, engagement optimisation and the editorial calendars of the accounts producing the material, without any component representing the trajectory as such. The concept names the effect, and the effect remains observable from the position of the subject even where its production does not. Nor does the concept entail a passive recipient. Work on algorithmic imaginaries and on user tactics has documented the interpretive and practical labour performed in relation to systems that cannot be seen [3,17,18]. A subject may recognise the trajectory, resist it, exploit it or find it serviceable. My claim concerns what is made available and in what order, together with the labour required to depart from a sequence that arrives unbidden. Anticipation of this kind does not compel: it supplies a default, and defaults weigh in proportion to the effort of refusing them.

4. Materials and Empirical Procedure

Algorithmic systems are opaque, distributed across infrastructures and not directly accessible. A range of approaches has been developed in response, from algorithmic audits [36] to digital experiments [37], from digital methods [38] to the walkthrough method [39]. These prove effective for input-output relations, platform affordances and observable traces, less so for inference that is distributed, cross-environmental and extended in time. Digital ethnography offers a complementary route, situating analysis within the practices through which technologies are encountered [40], while analytic autoethnography allows the researcher's position to work as an instrument rather than as a source of contamination [41,42]. I follow Airoidi, Beraldo and Gandini [43] in treating sustained attention to what a system delivers as a means of rendering its operation partly legible. Pregnancy lends itself to such an attempt for the reasons already given, namely a codified stage structure, a datable onset and a dense articulation into stage-specific resources, much of it commercial, and for one reason more: it is a condition that is intimate before it is public, which renders observable the interval between inference and disclosure. Observation ran from April 2025 to January 2026 and was continuous rather than protocol-driven. I captured screenshots as the feed changed, week after week, without keeping a log of sessions or standardising duration and timing, and I retained items by salience rather than by explicit rule. The material became data only once the pregnancy had ended, when I coded and interpreted it. What this yields is the retrospective analysis of a contemporaneously assembled archive, a different thing from a retrospective reconstruction, and its composition should be read as a property of the archive rather than as a measurement of the feed. Characterising the archive requires clarity about the status of the objects composing it. The literature on algorithmic inference reaches for minimal traces, digital traces, heterogeneous traces and signals without distinguishing systematically between categories that are not equivalent, and the missing distinction bears on the argument advanced here, which turns on the kind of object available to the platform and the kind available to me as a researcher. Four categories warrant distinction:

1. Volunteered data are produced deliberately by a user who understands herself as their producer: a post, a comment, a profile field [44,45].
2. Captured data arise from observation of behaviour rather than from declaration, and include dwell time, scroll depth, the order in which items are viewed and the recording of an advertising exposure [45–47].
3. Combining records across environments yields derived data, which depend on infrastructures able to connect an identity in one context to an identity in another, through

shared identifiers, contractual data exchange, third-party tracking or probabilistic matching [48,49].

4. Inferred attributes, finally, are the output of models applied to any of the preceding categories and correspond to no action the user performed: they constitute attributions, not records [33,50,51].

Applied to my case, the distinction works chiefly by exclusion. The pregnancy-related searches were volunteered data, produced in a separate environment and for a purpose unrelated to research. What appeared in the feed is consistent with the operation of an inferred attribute, the material being addressed to a person understood as pregnant. What connects the two terms remains unknown: the route may have passed through derived data, through captured data internal to the platform, or through some combination of the two, and the case allows no decision between them. This is a property of the object rather than a deficiency of the account, since inference is precisely the operation that produces an output not traceable to a determinate input. A further asymmetry bears on the epistemology of research conducted from this position. Captured data are by definition invisible to whoever generates them: a user cannot know how long she lingered over an item, nor whether that lingering was recorded. Within a study conducted from the user's position, they therefore occupy a peculiar status, their existence certain, their content unavailable, their effects inseparable from those of anything else. Any account asserting that a user did not interact with content asserts, at best, that she did not interact deliberately. The formulation inference without interaction, used in an earlier statement of this argument, has accordingly been abandoned. The documentable absence is narrower: on the platform I ran no search, pressed no like, followed no account, left no comment and saved no post relating to pregnancy. Whether the platform received behavioural information from my viewing of that material exceeds what the design can establish, though it probably did, the more so as observation continued and my attention grew. The phrase "absence of explicit pregnancy-related engagement" states what can be stated. Work on digital traces has long insisted that data of this kind are made rather than found, and that the methods used in collection take part in constituting what they measure [38,52,53]. The point holds with particular force for an archive assembled by a researcher who was also the subject of the inference under study.

On this basis, the archive can be described in terms of its composition. Table 1 reports its distribution by phase.

I present the material at three levels, kept distinct throughout. Descriptive claims report what the archive contains; interpretive claims propose a reading of that content; infrastructural claims concern the systems that produced it, and I flag them as hypotheses wherever they appear, the design being unable to test them. Coding was inductive and carried out on the whole of the material retained after the observation period, through progressive comparison between items and emerging categories [54]. Five categories emerged and then held stable: diagnostic and informational content concerning pregnancy; bodily monitoring and physical practice; consumption, covering product recommendation and explicit advertising; normative address concerning what a mother should do or feel; and residual content unrelated to pregnancy. In the first phase, the diagnostic category dominates, and the material proves specific to the point of the process rather than to pregnancy in general: an editorial post on reading a faint line on a test, an informational post on first-trimester screening, a list-format post on what not to do before taking a test. The correspondence holds for a week, not for a condition. In the second phase, the diagnostic category recedes while bodily monitoring and normative address become more prominent among the items I retained, with a month-by-month guide to foetal growth, a sponsored advertisement for maternity clothing, a post on lesser-known gestational symptoms, a

post on being a good mother that presents itself as debunking myths while restating the standard. Material connecting pregnancy to physical training appears alongside these, including posts on exercise routines by trimester and one on the safety of running a marathon while pregnant. In the third phase, consumption-oriented content becomes the most prominent: a checklist for a hospital bag, a guide to choosing a pushchair, a sponsored advertisement for a personalised garment bearing the word *mamma*, instructional content on types of contractions and on preparation for breastfeeding. The material organises itself around actions to be performed ahead of an event that has yet to occur. Among the post-partum items, the address shifts from the body of the child to that of the mother, with material on abdominal recovery and on returning to a previous physical condition, framed in terms of short daily routines and rapid results. Three departures from the pattern warrant reporting, since an account finding only confirmation is for that reason less credible. Content unrelated to pregnancy persisted throughout the observation period and was never wholly supplanted: it came to be a minority of what I noticed and retained, which concerns my attention as much as the feed. Not all pregnancy-related material was normative, given that a substantial portion of the diagnostic category consists of clinical or descriptive content specifying no conduct and addressing the reader as someone seeking information rather than as a mother in the making. The departure of greatest significance comes from the fitness content, which resists any account of pure substitution: physical training was a prior interest of mine, and its reappearance in a form adapted to pregnancy indicates that the reconfiguration was not a matter of replacement. Earlier configurations appear retained and rearticulated rather than overwritten, and the post-partum material, returning to physical condition as its dominant theme, supports the same reading.

Table 1. Composition of the retained archive.

Phase	Weeks	Organic	Sponsored	Total	Sponsored Share
Probabilistic inference	1–13	21	7	28	25.0%
Classificatory stabilisation	14–27	23	12	35	34.3%
Anticipatory consumption and normative closure	28–40	23	20	43	46.5%
Post-partum	after week 40	3	7	10	70.0%
Total	—	70	46	116	39.7%

Note. Sponsored items were identified through the label shown on the post. The post-partum figures rest on ten items retained before observation was discontinued and call for corresponding caution. The rising share of sponsored material across the phases is consistent with the commercial form that prescription tends to take on platforms, though retention followed salience, so that the rise may reflect my own growing attention to commercial content as much as a change in what was displayed.

5. From the Case to the Concept: How the Five Features Were Derived

Section 3 defined algorithmic gestation through five jointly necessary features. The order of exposition inverts the order of the research, though: the features do not precede the material; they were abstracted from it along abductive lines, those by which theory construction in qualitative research proceeds from observations that resist the available categories [55,56]. I reconstruct the path here, indicating for each feature which characteristics of the archive suggested it and with what degree of determinacy. Such a reconstruction cannot serve as verification, since the material that would test the concept is the same

material that generated it. It serves two other purposes. The inference leading from observation to definition becomes open to inspection, allowing the reader to judge whether the abstraction was carried out with parsimony or forced upon the material. And it becomes possible to isolate the points at which the material resisted, which are the only available sign that the abstraction did not simply recover what it was looking for. For each feature I therefore distinguish what the archive documents, what the abstraction added, and what would remain to be established through a different design. Inference of an emerging biographical state is the feature derived most immediately, since it follows from a property of the material that imposes itself on observation before any coding. The content was addressed not to someone interested in pregnancy but to someone at a determinate point within it. A post on reading a faint line on a test addresses whoever took the test in the preceding days and loses pertinence a few weeks later; content on types of contractions has no addressee until pregnancy is advanced. This perishability is what suggests that the attribution concerned a condition with a course rather than a stable disposition, and the formulation of the feature rests on it. The abstraction adds a step the archive does not document, however, since it speaks of a biographical state where what is observed amounts to a succession of perishable content. Whether the platform represents a condition or orders commercial categories according to the course of that condition remains an infrastructural question, and the concept was delimited in Section 3 so as not to depend on the answer. The delimitation is not evasive: the difference between the two descriptions might correspond to no difference in the architecture of the system, and would in any case remain inaccessible from the position from which observation was conducted. Stage-sensitive temporal sequencing was suggested by a comparison between two orders. The retained material follows a progression from diagnostic content to foetal development, bodily monitoring, preparation for birth and post-partum recovery; my interests, across the same nine months, did not move in that direction. I formulated the feature from this asymmetry, on the reasoning that content aligned with preferences would have produced an order unrelated to the gestational calendar. What the archive supports is weaker than the formulation might suggest. It shows that the items I retained are ordered in a way consistent with stage-sensitive sequencing; it does not show that the feed as a whole was so ordered, since retention followed salience and what struck me as salient in a given week was itself shaped by the week I was in. Two further qualifications narrow the claim. The calendarisation of pregnancy is no invention of platforms but a clinical artefact they inherit, as Section 2 showed, so that whatever model operates in the sequencing might be the one circulating in content produced by accounts in the sector rather than one held by the platform. The Google searches also continued throughout the period, and the order may therefore reflect an ongoing informational relationship rather than a trajectory projected from an initial signal. An alternative account, in which continuing search signals combined with my own selective attention produced the observed order, cannot be excluded. The feature is retained because the material is consistent with it and because it names what the conceptual argument requires, and it stands as a hypothesis about platform operation that a design with control over search activity and systematic sampling of the feed could test. Progressive stabilisation of an algorithmic identity is the feature the material corrected, and the one yielding most information about the procedure of abstraction. The initial formulation, derived from the impression of a feed closing around a single figure, described consolidation as substitution: earlier configurations were replaced by the gestational one. Coding of the archive did not confirm that description. Content on physical training, which corresponds to an interest predating the pregnancy, does not disappear; it resurfaces adapted to the condition, in the shape of routines by trimester and guidance on the safety of exercise in pregnancy; in the post-partum material it then comes to dominate, with

physical condition as the leading theme. A configuration presumed erased turned out to be retained and available for reactivation. The feature was reformulated accordingly, and now describes a subordination of earlier configurations to a dominant one rather than their replacement. The reformulation specifies the working of the concept instead of weakening it: what stabilises is a hierarchy among competing attributions, and a hierarchy admits reordering when the condition changes phase. The post-partum shows this with particular clarity, since an earlier attribution returns to the foreground precisely as the gestational one exhausts its course. The correction retains significance independently of its own content, documenting as it does that the material kept the capacity to contradict the category applied to it. Anticipatory presentation of practices and needs was derived from experience before coding, and is the feature in which the autoethnographic position weighed most heavily; what makes it analytically usable, rather than merely evocative, is the obligation to refer it back to the retained material [42]. Content on hospital bags, types of contractions and preparation for breastfeeding reached me before I had formulated those concerns, and in some instances before I knew I would have to. The archive documents the date on which content appeared and its reference to stages not yet reached; it documents precedence, not effects. Beyond that, I can report how I experienced the precedence. The material told me what to prepare and, in the same gesture, that preparation was already due, and I met it as a reminder of tasks I had not known I was behind on. Whether content of this kind shapes the concerns of those who receive it is a question this design cannot answer, and I state it as a hypothesis rather than a finding. The genealogy reconstructed in Section 2 helps circumscribe what the feature attributes to algorithmic inference and what comes from other layers. The obligation of readiness does not originate in the feed, since intensive mothering has prescribed it for decades [15] and clinical calendarisation has long established that each week carries knowledge to acquire and decisions to take [12]. What algorithmic inference adds, on the evidence of this case, concerns delivery: unrequested content, appearing in an environment frequented for other purposes, ahead of the point at which I would have sought it. Normative prescription indexed to the projected trajectory is the feature for which the separation between definition and context matters most, since in the material the normative and the commercial rarely present themselves apart: a list of things to assess before buying a pushchair prescribes a conduct and proposes a purchase in the same utterance. I formulated the feature from the recurrence of content specifying conduct and appropriate feeling at each stage, a recurrence identified through coding but not counted by phase. Its commercial vehicle is documented more precisely. The share of sponsored material in the retained archive rises across the phases, from twenty-five per cent in the first trimester to over forty-six in the third, a pattern consistent with prescription taking an increasingly commercial form as the trajectory advances. The figures describe the archive and nothing more. Retention followed salience, and the rise may reflect my own growing attention to commercial content as much as a change in what the platform displayed; nor does the archive allow the normative category to be set against the sponsored share, since the former was not quantified. The intensive mothering reading remains confined to explicitly prescriptive material and does not extend to the informational and clinical content that makes up a substantial portion of the archive. Four features, then, were derived from the material without the material forcing their revision, though the support it lends them varies in strength and remains that of a single archive retained by salience. The fifth had to be reformulated, and that reformulation is the most significant result of this reconstruction, showing as it does that the abstraction did not proceed by confirmation and that the material kept a capacity to oppose the categories applied to it. What remains to be specified is the sense in which a concept derived in this way can hold beyond the case that produced it. It does not hold by statistical generalisation, which a

single case does not permit, nor as something verified, since verification would require material other than that of provenance. Work on the logic of the single case has shown, though, that the contribution of research of this kind should be measured by its capacity to generate transferable categories rather than by the representativeness of the sample [57,58]. The concept holds, then, to the extent that the five features are formulated at a level of specificity sufficient for other cases to come into tension with them, and to the extent that the scope conditions stated in Section 3 make it sayable which cases are pertinent. The proof falls to those cases, not to this one.

6. Discussion and Conclusions

I have proposed algorithmic gestation as a concept for a mode of platform operation that the available vocabulary describes only in part: the segmentation into stages of an inferred biographical condition, and the release of content along that projected trajectory at a pace following the condition as it unfolds. The principal work of the article has consisted in defining it through five jointly necessary features and in specifying the conditions under which it applies. A situation exhibiting all five features while lacking a codified stage structure would count against the scope conditions I have proposed, and it is in this form, not in that of a generalisation from the case, that the argument is offered for discussion. The second result came from placing the concept within the feminist STS literature on reproductive governance. Algorithmic inference joins an apparatus rather than replacing one: the clinic goes on visualising, diagnosis goes on producing probabilities, applications go on counting weeks, and intensive mothering goes on supplying the normative content that all these layers convey. What sets the algorithmic layer apart concerns how one enters it and how it addresses whoever finds herself inside. Entry occurs without a threshold, no act equivalent to the clinical visit or the installation of an application marking the passage; the calendar goes undeclared, becoming perceptible in retrospect if at all; and the address falls on a subject the system has identified, not on one who has presented herself. As an ambient layer, it is also the hardest to leave, there being no application to remove and no appointment to cancel. A consequence follows for the way platform power is conceived: beyond the management of visibility, it extends to the organisation of biographical time, that is, to what the subject sees, when she sees it and in what order, hence to which actions appear due to her at a given moment of her own course. The question belongs to a line of work that has examined the production of time by digital devices, from the regime of real time in platforms and search engines [59] to Esposito's analysis, conducted on financial markets, of how predictive techniques construct the futures they operate upon [60]. Compared with these contributions, algorithmic gestation isolates a narrower operation: neither the production of a permanent present nor the colonisation of the future as such, but the segmentation of a biographical trajectory and its deferred return to whoever travels it. The separation of the normative from the commercial in the definition does not remove commerce from the analysis; it relocates it. On platforms as they are presently organised, the stage-specific material available for sequencing is produced in large part by accounts with something to sell, and the incentive to deliver it ahead of need is an advertising incentive. A hypothesis follows which this case can illustrate but not establish: on commercial platforms normative and commercial prescription tend to converge, so that what the subject is told she should do and what she is invited to buy arrive as a single address. Whether the convergence holds, and whether non-commercial systems performing algorithmic gestation prescribe differently, are questions for comparative work. The argument comes from a single situated case, documented in an archive assembled without a protocol and analysed afterwards. The case generated the concept and supports its formulation; it does not establish that the proposed mechanism is the one that operated,

and Section 5 made explicit how each feature was abstracted from it. One of them required correction, since earlier configurations of the user turned out to be subordinated and rearticulated rather than replaced. The correction is set out rather than folded into the definition, documenting as it does a resistance of the material to the category applied to it and thereby making the procedure of abstraction open to assessment. A constraint characteristic of this kind of digital research bears on the whole analysis: the archive on which the empirical analysis rests cannot be published. The items are screenshots of Instagram content produced by brands, creators, editorial accounts and advertisers, and reproducing them would require permissions impossible to obtain from more than a hundred rights holders, several of them commercial entities with no interest in granting them. Anonymisation does not resolve the difficulty, since copyright protects the content rather than the identity of whoever produces it. The asymmetry at stake is substantial: the platform may observe a user in real time and retain indefinitely what it observes, while whoever documents what the platform displayed to her cannot exhibit the documentation. The material was delivered to a private feed by an automated system, which gives its status as evidence a peculiar character. It was not published to me in any ordinary sense, yet it is copyrighted; it was addressed to me specifically, yet I cannot demonstrate that it was. A contractual layer adds to this, since Meta's terms of use prohibit the collection and reuse of content outside the conditions the platform sets, so that the researcher finds herself negotiating with two distinct normative regimes converging on the same outcome. This is a recognisable member of a family of problems that the post-API literature has described for some years [19]; the withdrawal of research access, the closure of data-sharing programmes, and the legal exposure of independent auditing have narrowed the space within which platform behaviour can be studied and, with graver consequences, verified by others [20–22]. European law has recognised part of the problem and left another part untouched. Article 40 of the Digital Services Act grants vetted researchers access to data held by very large online platforms, and the delegated regulation adopted by the Commission on 2 July 2025 set out its procedures, establishing an access portal and entrusting vetting to the national digital services coordinators; the intervention bears on the availability of the material, not on its exhibitability. A vetted researcher obtains the data; she does not obtain the right to reproduce them. The same asymmetry reappears in the text and data mining exceptions introduced by Articles 3 and 4 of Directive (EU) 2019/790, which cover the analysis of protected material and not its reproduction for purposes of publication, in a legal order without a general clause comparable to US fair use. The link between the two regimes is more than analogical: the definition of a research institution eligible for vetting refers back to Article 2(1) of that same Directive, so that the right of access and the limit on reproduction descend from one and the same notion of research. Critical discussion of the provision, begun when it appeared as Article 31 of the draft regulation [61], concentrated on the conditions of obtaining material; its reuse at the point of publication stayed outside the frame. Copyright over platform content belongs, then, to the same family of obstacles and works within it in a peculiar way, hindering digital research by limiting its publication. The distinction matters for a field whose claims to knowledge about opaque systems rest on the accumulation of situated observations that others must be able to assess, and it points to a gap in European regulation of access, which has governed what researchers may obtain without governing what they may show. The consequence for this article is decisive: readers cannot inspect the material on which the interpretation rests and must therefore rely on the descriptions I offer. The concept of algorithmic gestation is offered for assessment on its own terms, against the encounters readers have with systems of this kind, and against future work able to show what I can here only describe. Two directions for research follow from the foregoing. The

first is comparative. Applying the five features to other transitions that satisfy the scope conditions (bereavement and retirement among them) would make it possible to establish whether the temporal pattern described is specific to reproduction or common to life stages articulated into stage-specific resources, and whether commercial and non-commercial systems sequence them differently, and would submit the concept to a test its case of provenance cannot supply. The second is methodological and concerns the conditions of research in this area. Work such as this is constrained less by the difficulty of observing platforms than by the difficulty of exhibiting what has been observed, and the copyright status of platform content deserves a place beside API closure in discussions of what may still be studied and, more pointedly, of what may still be verified by anyone who did not conduct the study. If platforms organise the biographical time of their users, and if the material through which they do so remains unexhibitable, then the question of how to render their operation open to discussion concerns the field as a whole and not the single study that runs up against it.

7. Ethics Statement

The empirical material consists of screenshots of content encountered in the author's personal Instagram feed during the observation period. The content was produced by brands, advertisers, editorial accounts and individual creators, and was delivered by the recommendation and advertising systems of the platform rather than sought through search or accessed in restricted spaces. No private accounts were consulted, and no content was collected from closed groups or direct messages. Since the material was captured as displayed, the archive contains identifying elements: account names, profile images and, in some items, faces and personal narratives belonging to creators. None of this material is reproduced in the article, and no creator or account is named. Representative items are described in general terms, with account names and identifying details omitted. The archive is held by the author on encrypted personal storage and is accessible to no other party. Should material be shared for purposes of verification, identifying elements will be removed beforehand, and no item will be shared in a form permitting a creator or an account to be identified. The study did not set out to analyse individual users or creators, whose content is treated as evidence of platform output rather than as an object of analysis in itself. The study concerns the author's own experience and involves no other human participants, so that ethical approval was not required under the applicable institutional framework.

The material underlying this article consists of screenshots of copyrighted content displayed within a personalised platform environment, together with the author's research notes. Copyright restrictions prevent the publication and general distribution of the visual material. Anonymised descriptions and coding records may be made available by the author on reasonable request, within the limits described in the ethics statement.

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Institutional Review Board Statement: Ethical review and approval were waived for this study because it is based on a single-author digital autoethnography involving only the author's own online experiences and interactions. No human participants other than the author were involved, no personal data from third parties were analysed or reproduced.

Informed Consent Statement: Not applicable.

Data Availability Statement: Copyright restrictions prevent the publication and general distribution of the visual material. Anonymised descriptions and coding records may be made available by the author on reasonable request, within the limits described in the ethics statement.

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