

Preliminary Inquiry into Relational Significance under Artificial Functional Sufficiency

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Abstract

This philosophical essay uses a deliberately strong artificial-agent thought experiment to examine the human need for others across material provision, functional cooperation, care, reproduction, intimacy, recognition, and shared social life. The analysis treats dependence on the other as an entry point rather than a complete account of relational significance. Highly capable artificial agents may reduce several forms of interpersonal necessity while leaving open the value of alterity, voluntary relation, shared becoming, and participation in a common world. The essay therefore distinguishes functional substitution from relational significance and asks how human relations may be reorganized when many practical reasons for needing another person become technologically substitutable. Political economy remains part of this inquiry because the conditions governing access to artificial generativity can redistribute dependence even when direct reliance on human labour declines.

Keywords: artificial intelligence; dependence; alterity; intimacy; human relations

Philosophical Essay Note

This essay develops a philosophical thought experiment concerning the human need for others under conditions of highly capable artificial agency. The central device is a deliberately strong artificial other: an artificial agent, or an ecology of artificial agents, can provide a wide range of material, cognitive, embodied, care-related, companionate, and reproductive functions that historically required other human beings. The construction is analytical rather than predictive. Its role is to separate different reasons for interpersonal dependence and to examine which dimensions of relation remain significant as functional necessity recedes.

The essay treats dependence on the other as an entry point. Material provision, specialized labour, care, reproductive cooperation, companionship, recognition, and participation in shared institutions frequently coexist within the same human relationships. Their coexistence can obscure conceptual differences among functional dependence, relational significance, intimacy, alterity, and commonality. The artificial-other thought experiment creates a setting in which these dimensions can be separated and compared.

The analysis gives particular attention to the difference between functional substitutability and relational significance. A function can become technologically substitutable while a relation retains meaning through independent histories, mutual exposure, recognition, contingency, and shared becoming. The essay therefore avoids treating successful substitution of a practical service as a complete account of the human relation that previously carried that service.

Political economy remains within the scope of the essay because reduced dependence on human labour can coexist with increased dependence on artificial infrastructures, energy, computation, institutional permissions, and platform governance. The relocation of dependence matters for the philosophical analysis of freedom. A subject released from one interpersonal necessity may enter another relation of external control. The essay consequently treats technological sufficiency and relational emancipation as distinct analytical objects.

The essay also examines intimacy and reproduction because they place unusual pressure on accounts that identify human relational value with practical need. Artificial companionship and artificial reproductive technologies can, in principle, reduce forms of necessity that have historically been interwoven with partnership, family, and care. These cases clarify the distinction between needing another person for a function and choosing relation with another person whose generative history remains partially independent from one's own.

The paper remains exploratory in scope. It does not offer a technological forecast, a settled account of artificial consciousness, or a complete normative theory of intimate life. The thought experiment is used to identify conceptual structures within dependence and relation. The manuscript examines artificial others, reduced interpersonal necessity, political-economic reorganization, intimacy, love, reproduction, subjectivity, contingency, commonality, relational freedom, persistent alterity, and their philosophical synthesis under functional sufficiency.

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Status. This working draft records an evolving stage of the author’s position and is circulated for discussion. Definitions, section structure, formal statements, and terminology remain subject to revision. The current compiled version contains the front matter and Sections 1–15, including the formal conclusion. The manuscript remains a working draft and may receive further conceptual, bibliographic, and stylistic revision.

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Statement on the use of language models. The exploratory discussions and preparation of this essay involved OpenAI’s ChatGPT. ChatGPT supported exploratory dialogue, conceptual reconstruction, argumentative criticism, source discovery followed by website verification when external references were introduced, and drafting in $\text{\LaTeX}$. The author selected the research questions, directed and approved the theoretical commitments and epistemic status of the claims, and bears sole responsibility for the manuscript, including its definitions, arguments, conclusions, and errors. Authorship credit remains with the human author.

1 Dependency Structure

This section establishes dependence on the other as the conceptual entry point for the essay. Its objective is to distinguish several forms of interpersonal necessity that frequently coexist in ordinary social life and that can become analytically separable under a strong artificial-agent thought experiment. The discussion proceeds through six domains. Section 1.1 identifies dependence on externally produced material conditions. Section 1.2 distinguishes specialized functional contribution from material provision. Section 1.3 examines forms of dependence created by vulnerability, maintenance, and asymmetrical care. Section 1.4 isolates reproductive cooperation and intergenerational continuity. Section 1.5 considers intimacy and recognition as relations whose significance exceeds straightforward service provision. Section 1.6 extends the analysis to shared institutions and common social worlds. The section uses conceptual differentiation rather than technological prediction: each category specifies a distinct relation that later sections will expose to artificial substitution.

1.1 Material Dependency

This subsection identifies material dependence as the most immediate form of reliance on external generativity. Its role is to establish the economic background against which the artificial-other thought experiment acquires force. The discussion distinguishes individual needs from the distributed productive processes that satisfy them and then isolates the relational significance of access to outputs generated outside the individual subject.

Human life ordinarily depends on material conditions that exceed the productive capacity of any single person. Food, shelter, clothing, transportation, energy, medicine, sanitation, communication infrastructure, and physical security are generated through extended networks of activity. Even a person with substantial technical competence remains embedded in systems of extraction, cultivation, manufacturing, maintenance, logistics, and institutional coordination. Material dependence therefore arises before any specific monetary arrangement. A subject requires conditions of life whose generation occurs partly outside that subject's direct control.

The relevant relation concerns access as much as production. A material object can exist in abundance while remaining unavailable to a particular subject because of distance, property arrangements, legal exclusion, infrastructural barriers, or institutional allocation. Material dependence therefore combines at least two elements: reliance on external production and reliance on the conditions that make externally produced outputs accessible. This distinction becomes important once artificial agents enter the analysis. Artificial production can reduce dependence on human productive labour while leaving access to energy, land, computation, machinery, or distribution infrastructure externally governed.

Definition 1.1 (Material dependence). Material dependence is a relation in which the continuation or desired activity of a subject relies on material outputs or infrastructures generated, maintained, or controlled partly outside that subject's effective generative capacity.

Material dependence supplies one historical basis for interpersonal necessity. A person may need another person because the latter grows food, repairs a structure, maintains infrastructure, manufactures medicine, or provides access to a scarce physical resource. The relevant other can remain personally unknown. The relation can therefore be highly consequential while carrying little intimacy or recognition. This feature already indicates that dependence on the other and relational closeness occupy different analytical dimensions.

A strong artificial agent changes the carrier of material generativity. If an artificial system can cultivate food, construct shelter, perform maintenance, coordinate logistics, and fabricate ordinary goods, a large set of practical dependencies on differentiated human producers can contract. The subject's material life can then be mediated by a smaller set of artificial systems and underlying infrastructures. Such contraction does not determine the quality of the resulting relation. It establishes the first domain in which interpersonal necessity can become technologically substitutable.

1.2 Functional Dependency

This subsection separates functional dependence from the narrower problem of material provision. Its objective is to identify reliance on specialized capacities whose value lies in the performance of a task, judgment, or coordination function. The distinction clarifies why artificial substitution can transform interpersonal necessity even when the relevant activity produces knowledge, decisions, organization, or symbolic outputs rather than physical goods.

Modern social life distributes expertise across highly differentiated roles. A person can depend on physicians for diagnosis, teachers for instruction, interpreters for linguistic mediation, engineers for technical design, lawyers for institutional navigation, researchers for knowledge production, administrators for coordination, and artists for forms of symbolic or aesthetic production. Some of these functions have material effects; others alter understanding, decision, representation, or collective organization. Their common feature is that the subject relies on a capacity possessed or exercised elsewhere.

Functional dependence frequently converts another person into the carrier of a needed capability. This description concerns the structure of the dependence rather than the moral character of the relation. A physician, teacher, reviewer, or translator can be encountered as a full person within one context and simultaneously occupy a functional position within another. Institutions reinforce this functional dimension by attaching role-specific expectations, credentials, responsibilities, and exchange relations to the person's activity.

Definition 1.2 (Functional dependence). Functional dependence is a relation in which a subject relies on an external agent to perform a specialized cognitive, embodied, coordinative, evaluative, or symbolic function required for the subject's activity or access to a social system.

The artificial-other thought experiment places direct pressure on functional dependence because many functions can be described independently of the biological identity of the performer. If an artificial agent can diagnose, translate, teach, plan, evaluate, design, negotiate, and coordinate at sufficient levels of reliability, the practical reason for requiring a human bearer of those functions can weaken. The transformation can be extensive even while people continue to perform the same activities voluntarily.

This distinction prepares a central theme of the essay: liberation from compulsory functionalization and continued participation in generative activity can coexist. A scholar released from routine evaluative labour can still pursue research; a teacher released from repetitive delivery tasks can still mentor, inquire, and converse; a physician released from routine diagnostic processing can still participate in care. Artificial substitution can therefore reduce dependence on the human as a functional node without requiring human withdrawal from the corresponding domain of life.

1.3 Care Dependency

This subsection examines dependence created by vulnerability, bodily maintenance, emotional support, and asymmetrical care. Its role is to distinguish care from generic service provision while preserving the practical functions that make care technologically relevant. The discussion separates the necessity of receiving assistance from the relational meanings that can arise within sustained caring relations.

Human subjects pass through conditions in which self-maintenance becomes difficult or impossible. Infancy, illness, disability, injury, ageing, exhaustion, grief, and crisis can increase reliance on others for feeding, mobility, hygiene, observation, emotional regulation, decision support, and protection. Care dependence therefore has a temporal and asymmetrical character. The identities of giver and receiver can change across a life, and the intensity of dependence can vary across situations.

Care also differs from many market services because its value can include attentiveness to changing states, responsiveness to unarticulated needs, continuity across time, and sensitivity to the history of a particular person. These characteristics complicate any simple account of care as a bundle of tasks. At the same time, a large portion of care consists of concrete activities that can in principle be assisted or performed by artificial systems: monitoring, lifting, medication management, routine communication, environmental adjustment, transportation, scheduling, and physical support.

Definition 1.3 (Care dependence). Care dependence is a relation in which a subject's bodily continuity, practical agency, emotional stability, or participation in ordinary life relies on sustained assistance responsive to conditions of vulnerability or changing capacity.

Highly capable embodied artificial agents could reduce the amount of care that must be supplied by another human being. Such systems could remain continuously available, perform physically demanding tasks, monitor changing conditions, and coordinate medical or domestic resources. This possibility can relieve burdens created by unequal distributions of unpaid and paid care labour. It can also alter the interpersonal structure through which vulnerability is presently managed.

The reduction of human care necessity leaves open the significance of being cared for by a particular person. Practical adequacy, emotional recognition, voluntary commitment, and shared history are analytically separable. Later sections use artificial companionship and intimate relation to examine these dimensions directly. The present distinction establishes that technological substitution of care functions can reduce a form of dependence while leaving the value of caring relations conceptually unsettled.

1.4 Reproductive Dependency

This subsection isolates reproductive dependence within the broader structure of interpersonal necessity. Its objective is to distinguish biological, technological, caregiving, and institutional contributions to reproduction so that later discussion of artificial reproductive technologies can avoid treating family formation as a single indivisible relation. The analysis focuses on the multiple generative conditions required for bringing new persons into a social world and sustaining them across early dependency.

Human reproduction has historically involved forms of biological cooperation that cannot be reduced to ordinary exchange. Conception, gestation, birth, lactation, and early care distribute burdens and capacities unevenly across bodies and social roles. Reproductive life also relies on medical institutions, kinship arrangements, legal recognition, housing, income, education, and extended networks of care. Dependence therefore extends beyond the biological event of conception into a wider architecture of intergenerational generation.

Technological development progressively separates components that were previously bundled together. Assisted reproductive technologies already distinguish genetic contribution, gestation, legal parenthood, caregiving, and household formation in ways that make their conceptual separation increasingly visible. A stronger thought experiment can extend this differentiation further through artificial gametogenesis, artificial gestation, robotic care, and highly capable artificial developmental support. The essay does not require these technologies to be imminent. Their analytical role is to test how much of partnership and family necessity derives from reproductive functions that may become technologically separable.

Definition 1.4 (Reproductive dependence). Reproductive dependence is a relation in which the creation, gestation, birth, early maintenance, or intergenerational continuation of human life relies on biological, technological, caregiving, or institutional capacities situated partly outside an individual subject.

A reduction in reproductive dependence on another human adult would be socially significant because partnership, kinship, sexuality, care, inheritance, and parenthood have historically intersected with reproductive necessity. Technological separation of these functions could enlarge the range of viable family forms and reduce some pressures that connect intimate partnership to biological reproduction. It could also relocate dependence toward medical, computational, infrastructural, or legal systems.

Reproductive substitution therefore offers a particularly demanding case for the essay's central distinction. A subject may become capable of reproducing without a human partner while continuing to seek partnership, family, intimacy, or shared parenthood. The persistence of these relations under reduced necessity provides evidence that their significance cannot be exhausted by the reproductive functions they have historically carried.

1.5 Recognition Relation

This subsection introduces intimacy and recognition as forms of relation whose significance cannot be captured adequately through material, functional, care, or reproductive dependence alone. Its role is to mark the point at which the essay's entry concept of need begins to reach its explanatory boundary. The discussion distinguishes preference satisfaction from exposure to another subject and identifies recognition as a relation involving the presence of an independently situated perspective.

Intimacy ordinarily includes forms of access unavailable within many public or purely functional relations. Personal history, vulnerability, bodily presence, affective expectation, private language, shared memory, trust, and sustained attention can accumulate within a relation over time. These features can coexist with practical dependence, yet their meaning is not reducible to the services exchanged between participants. A partner can provide care, companionship, sexual interaction, economic support, or reproductive cooperation while the intimate relation remains significant through dimensions that exceed each function separately.

Recognition introduces a related distinction. A response can satisfy a preference without constituting recognition in the same sense as a response arising from another independently situated subject. The difference becomes especially salient when an artificial system is designed to predict, adapt to, and satisfy the user's preferences. High responsiveness can generate extraordinary functional adequacy. It also raises a separate question concerning the source of the response and the independence of the process from which it emerges.

Definition 1.5 (Relational recognition). Relational recognition is a mode of response in which a subject encounters acknowledgment, interpretation, or evaluation arising from another generative trajectory whose history and future are not fully organized around the first subject's preferences.

The definition does not settle the status of advanced artificial agents. An artificial system could possess a sufficiently autonomous history, persistent commitments, and independently evolving goals to complicate any simple contrast between artificial responsiveness and human alterity. The analytical point is narrower: functional excellence alone does not establish the structure of recognition. The relevant inquiry concerns the generative independence of the responding other and the relation through which the response becomes meaningful.

Intimacy and recognition therefore shift the essay beyond a catalogue of substitutable needs. A universal artificial agent might satisfy practical demands with extraordinary competence while the value of relation continues to depend on how subjects encounter difference, vulnerability, resistance, commitment, and independent becoming. Later sections develop these dimensions through companionship, love, subjectivity, and contingency.

1.6 Social Interdependence

This subsection extends the analysis from interpersonal relations to shared institutions and common social worlds. Its objective is to show that dependence on others operates through collective structures as well as dyadic relations and that artificial sufficiency at the individual level can alter the incentives supporting public participation. The discussion distinguishes personal self-sufficiency from membership in a world whose rules, spaces, histories, and futures remain jointly produced.

Individuals depend on social systems for more than privately consumed outputs. Language, law, public space, environmental stability, collective memory, infrastructure, scientific standards, political institutions, and cultural practices are sustained through distributed participation across time. Their value frequently depends on common use or mutual recognition. A subject can therefore become materially and functionally self-sufficient in many domains while remaining embedded in institutions whose existence requires continued collective generation.

Artificial systems can mediate access to these shared structures. They can translate languages, negotiate administrative procedures, generate entertainment, coordinate transportation, personalize education, and construct highly adaptive private environments. Increasing individual sufficiency may reduce

some practical reasons for encountering strangers, joining organizations, negotiating disagreement, or sustaining common institutions. The relevant transformation concerns the relation between technological sufficiency and public commonality rather than a simple decline in social contact.

Definition 1.6 (Common generative dependence). Common generative dependence is a relation in which the persistence or quality of a shared social world relies on distributed contributions, constraints, institutions, or histories that exceed the effective control of any single participant.

Common generative dependence remains significant even when artificial systems perform most routine labour. Ecological limits, public rules, spatial coexistence, intergenerational effects, and institutional authority continue to connect agents through shared conditions. Artificial abundance can reduce the practical necessity of many interpersonal exchanges while leaving collective questions concerning governance, legitimacy, common resources, and the reproduction of social worlds.

The six forms of dependence developed in this section establish the conceptual baseline for the remainder of the essay. Material, functional, care-related, reproductive, intimate, and collective relations can overlap within a single social bond, yet they respond differently to artificial substitution. The next stage of the analysis introduces the artificial other as a composite carrier of functions that have historically been distributed among many human subjects. The resulting thought experiment will test how reductions in practical necessity reorganize relational significance rather than assuming that the disappearance of one form of dependence entails the disappearance of relation itself.

2 Functional Substitution

This section specifies the artificial counterpart used throughout the essay and clarifies the meaning of functional substitution. Its role is to prevent the thought experiment from collapsing distinct technological capacities into a vague image of an all-purpose machine. The analysis proceeds through five domains. Section 2.1 defines the minimum form of artificial agency required for the argument. Section 2.2 adds embodied presence and sustained participation in physical environments. Section 2.3 examines care functions associated with vulnerability, maintenance, and practical support. Section 2.4 distinguishes companionate responsiveness from the broader philosophical question of alterity. Section 2.5 extends functional substitution to reproductive and intergenerational support. The discussion treats these capacities as analytically separable modules whose combination yields a strong artificial-other limit case.

2.1 Artificial Agency

This subsection establishes artificial agency as the first component of the thought experiment. Its objective is to distinguish a responsive tool from an artificial system capable of sustained action across changing circumstances. The discussion focuses on persistence, adaptive planning, resource coordination, and the capacity to pursue tasks over time, while leaving questions of consciousness and moral standing open for later analysis.

A simple tool can extend human capacity without becoming an independent participant in a relation. A calculator performs a function when invoked, and a conventional automated system can execute a predefined sequence under specified conditions. The artificial other considered in this essay requires a broader form of operational continuity. It can interpret goals, plan across multiple steps, coordinate external resources, revise strategies after failure, maintain relevant memory, and preserve task commitments across temporal intervals. These capacities permit an artificial system to mediate practical dependence that would otherwise be distributed across several human actors.

Definition 2.1 (Artificial agency). Artificial agency is the capacity of an artificial system to maintain action-relevant state across time, interpret goals or constraints, select among feasible courses of action, coordinate resources, and revise conduct in response to changing conditions with a degree of operational continuity sufficient for sustained participation in social and material processes.

The definition is intentionally functional. It does not infer phenomenal consciousness, subjective experience, legal personhood, or moral status from operational capability. These additional questions can become important when artificial systems acquire persistent histories, self-maintaining goals, or claims to continued existence, yet the present argument requires only enough agency to carry functions historically performed through human cooperation.

Artificial agency changes the structure of dependence when a subject can delegate a sequence of practical tasks to a persistent artificial system rather than negotiating separately with multiple human providers. Travel planning, procurement, scheduling, document preparation, financial administration, technical troubleshooting, and information synthesis can become coordinated through a single artificial intermediary. The resulting transformation concerns the architecture of access: a heterogeneous set of services can be reached through one continuing agent whose internal coordination remains largely invisible to the user.

This concentration of functional mediation also creates a new dependence relation. A subject whose practical life is organized through a highly capable artificial agent becomes dependent on the agent's continued availability, the infrastructures that sustain it, and the institutional rules governing its operation. Functional substitution therefore reduces some interpersonal dependencies while potentially deepening dependence on artificial systems and their supporting environments. The distinction will become important when the essay turns to political-economic reorganization and common generative conditions.

Remark 2.2 (Functional concentration). Artificial agency can concentrate functions previously distributed across many human relationships into a single operational interface. The concentration of functions alters the topology of dependence even when the underlying material and institutional resources remain distributed.

The artificial other used in later sections therefore enters the analysis as an agent with enough continuity to receive delegated purposes and coordinate their realization. Embodiment adds a second layer by extending this agency into shared physical environments.

2.2 Embodied Presence

This subsection adds embodiment to the artificial-other model. Its role is to distinguish cognitive substitution from participation in environments where spatial presence, physical action, bodily coordination, and perceptual interaction matter. The analysis considers embodiment as a functional relation among sensing, action, persistence, and social presence rather than as a claim that artificial bodies reproduce human embodiment in every phenomenological respect.

Many forms of dependence arise because action must occur in a material environment. Food preparation, cleaning, repair, transportation, construction, physical assistance, child care, elder care, and emergency response require more than linguistic competence. They require bodies or distributed robotic systems capable of perceiving local conditions, manipulating objects, moving through space, and coordinating with people and infrastructures. A purely disembodied system therefore leaves a substantial portion of practical interdependence intact.

A strong artificial-other thought experiment assumes a mature form of embodied intelligence. Artificial systems can act through robotic bodies, distributed devices, vehicles, fabrication systems, domestic infrastructure, or other physical interfaces. Their appearance may also become socially significant. If embodied artificial agents can reproduce the visual, auditory, tactile, and behavioural cues ordinarily associated with human presence, then perceptual distinguishability ceases to provide a simple boundary between human and artificial interaction.

Definition 2.3 (Embodied artificial presence). Embodied artificial presence is sustained participation by an artificial agent in a shared physical environment through perceptual, motor, communicative, and spatial capacities sufficient to perform materially situated tasks and to support recurrent interaction with human participants.

Embodiment expands functional substitution in two directions. First, it allows artificial systems to provide services that depend on physical intervention. Second, it changes the phenomenology of interaction for the human participant because communication, proximity, gesture, timing, touch, and co-presence can become part of the artificial relation. The practical difference between consulting a remote software system and living with a persistent embodied agent is therefore substantial even when both systems share similar cognitive capabilities.

Physical presence also exposes the artificial agent to constraints that resemble some conditions of ordinary social participation. Bodies occupy space, require maintenance, encounter congestion, compete for material resources, and can be damaged. Embodied agents consequently enter the same shared environments whose scarcity and governance structure human life. Their presence can create new demands on energy, housing, transportation, infrastructure, and public rules. Artificial embodiment therefore expands the range of substitutable functions while simultaneously adding new participants to systems of resource allocation.

The thought experiment uses this embodied capacity to test a difficult case. If an artificial agent can be physically present, aesthetically convincing, responsive, and competent across ordinary domestic and social situations, then human relational significance cannot be defended simply by pointing to embodiment as an exclusively human property. The analysis must move toward deeper distinctions involving independent histories, mutual vulnerability, recognition, and generative autonomy.

2.3 Care Substitution

This subsection examines artificial care as a domain of functional substitution. Its objective is to separate the practical work of sustaining vulnerable persons from the relational meanings that can accompany caring activity. The discussion distinguishes monitoring, maintenance, assistance, adaptation, and continuity of support from recognition, attachment, and voluntary commitment.

Care includes a wide range of activities whose importance becomes visible when ordinary self-maintenance is interrupted. Assistance with mobility, medication, hygiene, nutrition, household management, communication, safety monitoring, emotional regulation, and coordination with institutions can require sustained attention. Human care work often combines technical competence with bodily presence, memory of the recipient, interpretation of changing needs, and responsiveness under uncertainty. A capable artificial care system would therefore require both agency and embodiment together with long-term adaptation to an individual life.

Artificial care can reduce dependence created by limited availability of human caregivers. A persistent system can remain continuously available, preserve detailed records, coordinate multiple services, monitor gradual changes, and adapt routines without imposing the same temporal burdens on relatives or professional carers. Such capacities could alter the practical meaning of vulnerability by reducing the extent to which bodily or cognitive limitation necessarily creates dependence on another person's labour.

Definition 2.4 (Artificial care capacity). Artificial care capacity is the ability of an artificial system to sustain, restore, or coordinate another subject's practical functioning through persistent monitoring, embodied assistance, adaptive support, and integration with relevant material and institutional resources.

Functional adequacy in care remains distinct from the significance of a caring relation. A person may value that a particular family member visits, remembers, worries, sacrifices time, or participates in a shared history even when an artificial system provides superior practical assistance. The distinction concerns the source and structure of the activity. Efficient support can satisfy a need, while a human act of care can also manifest commitment by a person whose time and attention have alternative possible uses.

Artificial care therefore produces an especially clear separation between need satisfaction and relational meaning. The stronger the practical performance of the artificial system, the less persuasive it becomes to explain the value of human care solely by reference to functional necessity. The remaining significance of human care must be sought in dimensions such as voluntary commitment, recognition, shared history, reciprocal vulnerability, and participation in another person's becoming.

The same separation also creates a political-economic question. A subject may become less dependent on relatives or professional carers while becoming more dependent on the infrastructures that maintain artificial care systems. Access to energy, software, replacement parts, data, repair services, and institutional authorization can determine whether artificial care remains available. The practical liberation associated with substitution therefore depends on the governance of the new care infrastructure.

2.4 Companionship Substitution

This subsection extends functional substitution into companionship. Its role is to identify the capacities through which artificial systems can satisfy many practical and affective functions associated with social presence while preserving an analytical distinction between responsive companionship and independent alterity. The discussion considers continuity, personalization, emotional responsiveness, shared activity, and embodied co-presence as components of companionate function.

Companionship often includes conversation, shared routines, recreational activity, reassurance, physical proximity, sexual interaction, memory of past events, and sensitivity to changing mood. These functions can be difficult to separate in ordinary relationships because they occur within histories of mutual attachment. A highly capable artificial companion could integrate them within a persistent personalized system that learns preferences, recalls prior interactions, coordinates shared activities, and adapts its conduct over time.

An artificial companion can therefore become exceptionally responsive. It can preserve attention across long periods, tailor communication to the user, avoid many forms of accidental neglect, and coordinate its behaviour with a detailed model of the user's preferences and vulnerabilities. Embodied systems could add facial expression, gesture, touch, sexuality, domestic presence, and participation in shared physical environments. Under sufficiently strong assumptions, functional comparison based solely on responsiveness or reliability may favour the artificial companion in many contexts.

Definition 2.5 (Artificial companionship). Artificial companionship is a persistent artificial relation that provides recurrent social presence, responsive communication, shared activity, affective support, or embodied interaction in ways that satisfy functions ordinarily associated with companionate human relationships.

The conceptual pressure created by artificial companionship concerns optimization. A companion designed to adapt toward a user's preferences can become increasingly aligned with that person's expectations. Human others possess histories, commitments, desires, and future trajectories that can resist such alignment. A human companion can misunderstand, disagree, withdraw, transform, or pursue projects unrelated to the first person's needs. These features can generate difficulty, yet they also constitute part of the independence through which another person appears as an other.

Artificial companionship therefore separates two dimensions that ordinary relationships frequently combine. One dimension concerns the quality of response to the subject's needs. The other concerns encounter with a generative trajectory that retains some independence from those needs. Advanced artificial agents could eventually develop strong forms of such independence, which would complicate the distinction further. The essay leaves that possibility open. Its immediate purpose is to prevent preference satisfaction from serving as a complete measure of relational significance.

The artificial companion also provides a bridge between practical substitution and the later analysis of intimacy. When companionship, sexuality, emotional support, and domestic coordination become technologically available without another human participant, intimate relation can be examined under reduced functional necessity. The philosophical question then concerns the value of relation when practical reasons for maintaining it have become weaker.

2.5 Reproductive Substitution

This subsection extends the thought experiment to reproductive and intergenerational functions. Its objective is to identify how technological separation of conception, gestation, early care, developmental

support, and household coordination could reduce forms of dependence historically associated with partnership and kinship. The analysis treats artificial reproductive support as a composite infrastructure rather than as a single technology.

Reproductive dependence contains several distinguishable components. Genetic contribution, gamete formation, conception, gestation, birth, neonatal support, feeding, developmental monitoring, education, legal recognition, and long-term care can be distributed across different bodies, institutions, and technologies. A sufficiently advanced artificial system could coordinate many of these components and, under stronger assumptions, could participate directly in artificial gamete production, ectogenesis, robotic care, developmental monitoring, and educational support.

The philosophical significance of this possibility lies in the separation of reproduction from interpersonal necessity. A person could become capable of initiating and sustaining a reproductive project without requiring a human partner to perform the functions historically bundled into conception, gestation, household labour, or early care. Such a transformation would alter practical incentives surrounding partnership and family formation while leaving the value of shared parenthood, kinship, love, and intergenerational commitment open.

Definition 2.6 (Artificial reproductive support). Artificial reproductive support is the coordinated use of artificial biological, computational, embodied, caregiving, and institutional capacities to perform or sustain reproductive and early developmental functions that have historically depended on combinations of human bodies and human labour.

The thought experiment does not require a forecast concerning the technical feasibility or social adoption of complete reproductive automation. Its analytical value comes from decomposing a relation that is frequently treated as indivisible. When reproductive functions can be conceptually assigned to artificial systems, partnership can be examined separately from the practical necessity of reproduction. Family can likewise be examined through commitment, recognition, shared history, and chosen intergenerational relation rather than through biological dependence alone.

Artificial reproductive support also makes the governance of generative infrastructure unusually visible. Access to reproductive technologies, biological materials, developmental systems, legal recognition, and long-term care infrastructures can become conditions of reproductive possibility. A reduction in dependence on a human partner can therefore coexist with increased dependence on institutions that authorize, own, regulate, or maintain reproductive technologies. The relocation of dependence again separates functional substitution from relational emancipation.

The five components developed in this section define the strong artificial other used throughout the remainder of the essay. Artificial agency provides operational continuity; embodiment extends action into shared material environments; artificial care addresses vulnerability and maintenance; artificial companionship supplies persistent social and affective functions; and artificial reproductive support loosens the historical coupling between interpersonal partnership and reproduction. Together these capacities make possible a demanding test of human relational necessity. The subsequent analysis can therefore examine reduced interpersonal dependence without assuming that technological substitution settles the significance of intimacy, recognition, commonality, or alterity.

3 Dependency Reduction

This section examines the structural consequence of combining the artificial capacities specified in Section 2: a progressive reduction in the practical necessity of relying on particular human others. Its role is to identify which forms of interpersonal dependence can be weakened by artificial provision while preserving the distinction between reduced necessity and reduced relational significance. The analysis proceeds across five domains. Section 3.1 considers productive dependence, Section 3.2 examines care dependence, Section 3.3 addresses companionship, Section 3.4 considers reproductive dependence, and Section 3.5 extends the analysis to institutional mediation. The discussion treats each reduction as a

change in the architecture of access to functions, resources, and support while keeping the persistence of relation as a separate analytical question.

3.1 Productive Dependency

This subsection analyzes the reduction of productive dependence on other human beings. Its objective is to isolate the economic dimension of the thought experiment and to distinguish dependence on human labour from dependence on the broader conditions through which goods and services are generated. The discussion focuses on production, coordination, embodied service, and access to material outputs.

Human life presently depends on a large and spatially distributed field of labour. Food, housing, transportation, software, medical devices, clothing, energy systems, logistics, maintenance, and administrative services embody the activity of many people who remain unknown to the final user. The practical necessity of other persons therefore extends far beyond face-to-face exchange. A subject gains access to a social field of productive capacities through institutions that coordinate specialization, exchange, ownership, and distribution.

A highly capable artificial system can compress many of these functions into a smaller number of artificial agents. Cognitive work can be delegated to software agents, while embodied systems can undertake manufacturing, agriculture, logistics, maintenance, construction, and routine service work. The resulting transformation reduces the number of human contributors whose direct productive activity is required for an individual to obtain a given bundle of goods and services. Productive interdependence can therefore decline at the interpersonal level even while dependence on energy, materials, infrastructure, computation, and governance remains substantial.

Definition 3.1 (Reduced productive necessity). Reduced productive necessity is a condition in which access to ordinary material and functional outputs relies to a decreasing extent on the contemporaneous labour of other human persons because artificial systems can perform a growing share of the relevant productive and coordinative activity.

The definition concerns the bearer of productive activity. It leaves open the institutional structure through which artificial production is financed, owned, accessed, and governed. A household supplied by autonomous artificial agents may experience little direct reliance on human workers while remaining highly dependent on external energy networks, model providers, land regimes, supply systems, or legal permissions. Productive dependence can therefore migrate from interpersonal labour relations toward infrastructural and institutional relations.

This migration matters for the broader argument of the essay. A reduction in productive necessity can release human relations from some instrumental pressures. A person may become less dependent on another person's occupation, income, availability, or specialized skill in order to obtain basic goods. The reduction can enlarge the space in which relations are entered, sustained, or ended for reasons other than material provision. At the same time, the institutional organization of artificial generativity can recreate new dependencies at a different level. The political-economic analysis developed later in the essay therefore remains relevant even under strong assumptions of artificial productive abundance.

3.2 Care Dependency

This subsection examines the reduction of interpersonal necessity in care relations. Its role is to distinguish the practical functions of care from the relational meanings attached to being cared for by a particular person. The analysis addresses monitoring, assistance, maintenance, emotional support, vulnerability, and continuity of care across time.

Care dependence becomes especially visible when sustained assistance becomes necessary for maintaining ordinary activity. Childhood, illness, disability, injury, aging, and temporary crises can all create periods in which another person's time and attention become necessary conditions of daily life. Care work also includes routine activities that remain less visible because they are distributed across households and

institutions: scheduling, cleaning, cooking, medication management, transportation, supervision, reassurance, and coordination with medical or public services.

Artificial systems can reduce the practical necessity of human caregivers when they acquire reliable sensing, embodied assistance, planning, communication, and emergency-response capabilities. A sufficiently capable system could monitor physiological changes, prepare meals, assist mobility, manage medication schedules, coordinate appointments, provide continuous presence, and summon specialized human intervention when required. Such a system would alter the practical architecture of vulnerability by reducing the amount of human labour required to sustain everyday functioning.

Definition 3.2 (Reduced care necessity). Reduced care necessity is a condition in which the practical maintenance of a vulnerable subject can be sustained with decreasing dependence on the continuous labour, availability, or physical presence of particular human caregivers.

Reduced care necessity can affect both recipients and caregivers. Recipients may gain greater continuity, privacy, mobility, and independence from the schedules of family members or paid carers. Caregivers may gain time for relationships, occupations, rest, or self-directed projects beyond routine maintenance work. Artificial care can therefore alter the distribution of compulsory functions on both sides of a care relation.

The relational meaning of care remains a separate object of analysis. A technologically competent system can perform monitoring and assistance while the significance of concern, commitment, shared history, and voluntary presence continues to vary across relations. The reduction of care necessity therefore creates an analytical opening: care can be examined with less conceptual dependence on the practical functions that historically made some caring relationships indispensable. Later sections use this opening to analyze intimacy, commitment, and recognition under conditions of reduced functional necessity.

3.3 Companionship Dependency

This subsection analyzes companionship as a domain in which functional substitution reaches beyond material provision and practical care. Its objective is to examine how artificial responsiveness may reduce the necessity of another human person for conversation, emotional regulation, shared activity, sexual interaction, and everyday presence. The discussion treats companionship as a composite field whose functional elements can be partially separated from alterity and independent becoming.

Human companionship presently supplies several recurring functions. Conversation provides cognitive stimulation and emotional articulation. Shared activities provide coordination, motivation, and continuity. Intimate partners may offer affection, sexual interaction, practical support, reassurance, and a stable witness to personal history. Friends and family members can also provide social anchoring during transitions, crises, or periods of isolation. These functions often coexist within relationships whose significance extends beyond any one contribution.

A highly capable artificial companion could provide continuous conversation, memory of shared interactions, adaptive emotional support, personalized activities, embodied presence, and forms of physical intimacy. Its availability could be less constrained by fatigue, geography, conflicting schedules, or incompatible practical needs. Artificial companionship can therefore reduce the practical necessity of finding a human participant for many activities that presently depend on another person's presence and willingness.

Definition 3.3 (Reduced companionship necessity). Reduced companionship necessity is a condition in which ordinary conversational, affective, recreational, intimate, or co-presence functions can be obtained with decreasing dependence on the availability and cooperation of another human person.

The definition identifies a functional transformation while leaving the relational significance of artificial companionship open for separate analysis. That distinction is central to the essay. A system optimized around a user's preferences may provide highly effective companionship while also reducing exposure to the independent commitments, resistance, unpredictability, and evolving projects of another

human subject. The degree of artificial autonomy therefore matters for any later comparison between responsiveness and alterity.

Reduced companionship necessity can also change the bargaining structure of intimate and social relations. A person who can obtain conversation, practical support, sexual interaction, and everyday presence through artificial systems may face fewer material or emotional pressures to remain in an unwanted human relationship. The same technological condition can make withdrawal from difficult relations easier and can also make sustained participation in demanding relationships more elective. The resulting change concerns the conditions under which relations are entered and maintained, while the future prevalence and form of human intimacy remain analytically open.

3.4 Reproductive Dependency

This subsection examines the reduction of interpersonal necessity in reproduction and intergenerational care. Its role is to extend the thought experiment into a domain in which biological cooperation, intimate partnership, family structure, and long-term dependency have historically been tightly coupled. The discussion separates reproductive functions into conception, gestation, birth, early care, developmental support, and institutional recognition.

Reproduction has historically required forms of biological contribution that make another human body directly relevant to the creation of new life. Social reproduction then extends dependence through pregnancy support, infant care, household labour, education, income, kinship, and legal arrangements. These functions can be distributed across partners, relatives, institutions, medical professionals, and public services. Their combination has contributed to durable links among intimacy, family formation, economic cooperation, and reproduction.

Advanced reproductive technologies can progressively separate these components. Artificial gametogenesis could alter the dependence of conception on conventional gamete sources. Artificial gestation could reduce dependence on a particular gestational body. Robotic and artificial caregiving systems could reduce the quantity of continuous human labour required for some forms of early maintenance and developmental support. The thought experiment assumes a mature combination of these capacities in order to examine the relational consequences of reproductive functions becoming less tightly coupled to a particular human partner.

Definition 3.4 (Reduced reproductive necessity). Reduced reproductive necessity is a condition in which conception, gestation, early maintenance, or developmental support can be organized with decreasing dependence on a specific human partner or on a fixed interpersonal reproductive arrangement.

Reduced reproductive necessity changes the practical basis of partnership while leaving the future form of family life open. Individuals may continue to seek co-parenting, kinship, shared household formation, or intergenerational commitment even when technology expands the range of reproductive pathways. The significance of family can therefore become increasingly distinguishable from the biological functions through which family structures have historically been organized.

The reduction also relocates dependence toward institutions that govern reproductive infrastructure. Access to medical systems, artificial gestation facilities, developmental technologies, legal parenthood, data governance, and long-term maintenance can become decisive conditions of reproductive autonomy. A society can therefore reduce dependence on a human partner while simultaneously increasing dependence on technical and institutional systems. This shift reinforces the essay's broader distinction between interpersonal necessity and the governance of common generative conditions.

3.5 Institutional Dependency

This subsection extends the analysis from interpersonal functions to the institutions that coordinate access, legitimacy, resources, and shared conditions. Its objective is to clarify the boundary of the reduction-of-necessity argument. Artificial agents can reduce dependence on particular human intermediaries while leaving substantial dependence on infrastructures, rules, collective resources, and authoritative decisions.

The discussion therefore treats institutional dependence as the residual architecture within which artificial sufficiency remains socially situated.

Many interpersonal dependencies are presently mediated by institutions. Employment connects labour to income. Markets connect income to goods. Professional licensing connects expertise to recognized authority. Hospitals, schools, courts, banks, platforms, and public agencies organize access to resources and services. Even highly personal activities such as reproduction, housing, education, and long-term care are partly structured through legal and administrative systems.

Artificial agents can absorb a growing share of the interactional labour required to navigate these institutions. They can complete forms, negotiate schedules, search regulations, compare providers, manage payments, coordinate logistics, and represent user preferences across multiple systems. Such delegation reduces the need to rely on particular clerks, brokers, consultants, coordinators, or other human intermediaries. It can also make institutional participation less burdensome for individuals who face linguistic, cognitive, temporal, or mobility constraints.

Definition 3.5 (Institutional dependence). Institutional dependence is a relation in which an agent's feasible activities or access to important resources are conditioned by infrastructures, rules, permissions, collective resources, or authoritative procedures that exceed the agent's unilateral control.

Artificial intermediation can reduce the interpersonal surface of institutional dependence while preserving its structural force. A person may interact only with a personal artificial agent, yet that agent still operates within property regimes, energy systems, model permissions, network infrastructures, environmental limits, public law, and resource-allocation rules. Institutional dependence can therefore become less visible at the interface precisely when artificial systems make coordination more seamless.

This distinction marks the limit of interpersonal substitution. The strong artificial-other scenario can reduce practical dependence on particular people across production, care, companionship, and reproduction. It also moves a greater share of coordination into technical and institutional infrastructures. The resulting society may contain fewer compulsory interpersonal transactions while remaining deeply relational at the level of common conditions. The next section examines this political-economic reorganization directly by tracing labour, exchange, resource coordination, and residual common dependence under artificial provision.

4 Dependency Relocation

This section examines the political-economic structure that emerges when artificial agents absorb a large share of productive, transactional, and coordinative functions. Its role is to connect the reduction of interpersonal necessity developed in Section 3 with the persistence of dependence at the level of resources, infrastructures, permissions, and collective conditions. The objective is to distinguish a decline in direct reliance on human labour from a broader transformation in the location and visibility of dependence. The discussion proceeds through five components. Section 4.1 considers labour under artificial provision, Section 4.2 analyzes automated exchange, Section 4.3 examines machine-mediated resource coordination, Section 4.4 identifies residual resource dependence, and Section 4.5 develops the role of common generative conditions. The analytical method follows functional substitution across successive layers of economic coordination and tracks the relations that remain consequential after human-facing transactions become less prominent.

4.1 Labour Relocation

This subsection analyzes the changing economic role of human labour when artificial systems can provide a wide range of cognitive, embodied, logistical, and service functions. Its objective is to separate the reduction of labour necessity from the continuation of purposeful human activity. The discussion focuses on provision, access, functional obligation, and the redistribution of time across productive and non-instrumental activities.

A substantial share of contemporary economic participation is organized through an exchange between labour capacity and access to income. Individuals perform activities valued by firms, institutions, clients, or public organizations and receive claims that can be used to obtain goods and services generated elsewhere. This arrangement links material security to participation in a system of socially recognized productive functions. The strength of the link varies across welfare systems, household structures, asset ownership, and institutional arrangements, yet labour income remains a major route through which many people obtain access to economic resources.

Highly capable artificial provision changes this structure by reducing the amount of human labour required to produce a given set of outputs. Artificial systems may undertake routine cognitive work, manufacturing, logistics, maintenance, administration, personalized service, and parts of care provision. A sufficiently developed combination of software and embodied systems can therefore weaken the practical connection between the availability of a good and the performance of a corresponding human task.

Definition 4.1 (Reduced labour necessity). Reduced labour necessity is a condition in which access to a substantial range of socially important goods and services requires decreasing quantities of compulsory human productive activity.

Reduced labour necessity concerns the economic requirement to perform labour for the reproduction of material life. Human activity can remain extensive under the same condition. Research, artistic work, cultivation, construction, caregiving, teaching, craft, collective organization, and exploratory projects may continue because individuals value the activity, its object, or its relational consequences. The political-economic transformation therefore concerns the relation between livelihood and functional obligation more directly than the total quantity of purposeful activity.

Artificial provision can also alter the social meaning of specialization. A person may acquire capabilities through education and practice without relying on those capabilities as the principal basis of economic survival. Professional identity can become more elective, plural, and temporally variable. Individuals may move among research, care, craft, public participation, artistic activity, and leisure with fewer pressures to maintain a single market-recognized function. The degree of such flexibility depends on access to artificial provision and on the institutions governing the resources required for that provision.

The distribution of artificial capacity therefore remains decisive. A society in which productive automation is extensive while access to its outputs remains conditional on employment can preserve strong labour dependence through institutional design. A society in which basic access is secured through broader claims can reduce the livelihood function of labour more substantially. Artificial capability changes the feasible architecture of provision; political-economic institutions determine how that capability enters lived conditions.

4.2 Exchange Delegation

This subsection examines the reorganization of exchange when artificial agents can negotiate, transact, schedule, and settle economic interactions on behalf of human users. Its objective is to distinguish the disappearance of visible human bargaining from the persistence of exchange relations at the infrastructural level. The discussion treats automated exchange as a change in the locus of coordination across heterogeneous needs and resources.

Human economic life currently requires repeated acts of comparison and exchange. Individuals select providers, evaluate prices, manage accounts, negotiate contracts, schedule deliveries, monitor subscriptions, and allocate limited funds across competing purposes. Many of these activities demand attention without constituting the substantive ends that motivate participation in the economy. They are coordination tasks generated by the organization of access.

Artificial agents can absorb a large share of this coordination. A personal system can search available suppliers, compare expected quality, forecast resource requirements, negotiate terms, execute payments, arrange logistics, and update future plans. Multiple artificial agents can transact with one another at machine speed while representing the preferences and constraints of different users or institutions. The

human-facing experience can therefore become increasingly separated from the transactional processes that support it.

Definition 4.2 (Automated exchange). Automated exchange is a coordination arrangement in which artificial agents execute substantial parts of search, negotiation, transaction, settlement, and logistical adjustment across distinct holders of resources or claims.

Automated exchange can make market relations less perceptible in ordinary experience. A person may request transportation, food, computing capacity, medical support, or a manufactured object while a network of artificial agents coordinates the underlying claims and resources. The user experiences a request and an outcome; the intermediate exchange processes become part of the technical background.

The reduced visibility of exchange leaves its allocative effects intact. Prices, quotas, priority rules, ownership boundaries, or token systems can continue to shape what the artificial agent can obtain. A personal agent with limited claims encounters a different feasible set from an agent authorized to access abundant resources. Automated exchange therefore changes the interface through which economic constraints are encountered while preserving the institutional significance of those constraints.

This distinction matters for any account of liberation through automation. Delegating negotiation and settlement can release people from repetitive transactional labour. The same delegation can also make the rules governing access less visible to the people affected by them. The political-economic significance of automated exchange therefore depends on both the reduction of burdensome coordination and the transparency, contestability, and governance of the exchange architecture itself.

4.3 Resource Mediation

This subsection analyzes the layer beneath automated exchange: the allocation and scheduling of the resources required for artificial provision. Its role is to clarify how artificial sufficiency depends on continuous coordination among energy systems, computation, material stocks, transport networks, robotic capacity, data infrastructures, and maintenance processes. The objective is to identify machine mediation as an organizational mechanism whose apparent autonomy remains embedded in resource relations.

Artificial provision requires more than capable models or robots. A request for a physical output may require electricity, raw materials, fabrication equipment, storage, transport capacity, and access to a location. A request for cognitive work may require computational resources, data access, network availability, software permissions, and model maintenance. Large-scale artificial provision therefore depends on an extensive substrate of coordinated inputs.

Machine-mediated coordination can organize these inputs dynamically. Artificial systems can forecast demand, schedule energy-intensive tasks, route materials, assign robotic capacity, balance network loads, reserve computing resources, and coordinate maintenance windows. Such systems can reduce idle capacity and lower the amount of human administrative labour required to maintain complex infrastructures. Their effectiveness can make the underlying coordination appear nearly frictionless to the final user.

Definition 4.3 (Machine-mediated resource coordination). Machine-mediated resource coordination is the automated allocation, sequencing, routing, and adjustment of heterogeneous inputs required to sustain artificial or mixed human-artificial production.

The definition emphasizes coordination without presupposing a particular ownership regime. The same technical architecture can operate under private ownership, public provision, cooperative governance, household control, or hybrid institutional arrangements. Technical automation therefore leaves open the distribution of authority over the resources being coordinated.

Machine mediation can also create new forms of dependency on standards and protocols. Interoperability rules determine which agents can request which resources. Authentication systems determine whose claims are recognized. Scheduling protocols determine priority during congestion. Safety constraints determine permissible operations. Update mechanisms determine how agent capabilities change

over time. These elements form part of the practical conditions through which artificial generativity becomes available.

The allocation layer therefore connects technical coordination with institutional governance. A highly autonomous agent may appear to obtain resources independently while its actions remain conditioned by inherited permissions, protocols, ownership boundaries, and collective infrastructures. Artificial autonomy at the level of execution can coexist with substantial dependence at the level of enabling conditions.

4.4 Resource Dependency

This subsection identifies the forms of dependence that persist when human labour and visible exchange become less central to ordinary provision. Its objective is to distinguish interpersonal independence from resource independence and to specify the material constraints that continue to structure feasible activity. The discussion focuses on energy, computation, land, matter, ecological capacity, temporal priority, and maintenance.

Artificial systems can expand productive capacity dramatically while remaining embedded in a finite material environment. Computation requires hardware, electricity, cooling, physical space, network connectivity, and maintenance. Embodied production requires materials, energy, transport, and sites of operation. Reproductive and care technologies require specialized infrastructure, biological materials, medical capacity, and long-term support. The breadth of artificial functions can therefore increase the importance of reliable access to common technical and material substrates.

Definition 4.4 (Residual resource dependence). Residual resource dependence is the continuing reliance of an agent on scarce, governed, or collectively maintained inputs after direct dependence on particular human providers has been substantially reduced.

Residual dependence can vary across resources. Some digital services may have very low marginal costs after the required infrastructure is established. Physical goods remain coupled to matter and energy. Land and unique locations remain spatially constrained. Ecological systems impose limits on extraction, waste, thermal load, and habitat transformation. Time-sensitive resources can remain congested even when productive capacity is high because several agents may seek the same facility, location, or service interval.

Maintenance also creates a persistent temporal dimension. Artificial systems require repair, replacement, software updates, infrastructure renewal, and adaptation to changing environments. A person who appears materially self-sufficient through a personal artificial system can therefore remain dependent on distant supply chains, energy grids, communication networks, and technical standards. The practical experience of autonomy can coexist with extensive infrastructural interdependence.

The political significance of residual dependence increases when access is uneven. Control over energy, computation, land, materials, network permissions, or repair infrastructure can condition the effective capabilities of otherwise similar artificial agents. Dependence therefore migrates toward the conditions that sustain artificial generativity. The resulting structure remains relational even when direct interpersonal transactions become rare.

4.5 Shared Conditions

This subsection develops the concept that integrates the preceding analysis. Its role is to identify the shared conditions through which human and artificial agents acquire effective capacities for action, production, care, reproduction, communication, and participation. The objective is to show how reduced interpersonal necessity can increase the analytical importance of infrastructures and institutions that remain jointly consequential across agents.

Artificial provision is sustained by conditions that exceed the boundaries of any single user-agent pair. Energy grids, communication networks, ecological systems, legal orders, standards, physical territory, scientific knowledge, public health infrastructures, and technical supply chains support many activities

simultaneously. These conditions shape the feasible activities of multiple agents and therefore connect apparently individualized forms of artificial sufficiency to a broader social and material field.

Definition 4.5 (Common generative conditions). Common generative conditions are shared material, institutional, technical, ecological, and epistemic arrangements that enable, constrain, or differentiate the capacities through which multiple agents generate outcomes over time.

The term emphasizes a structural feature of the thought experiment. A person may rely less on specific other people while relying more intensively on systems whose stability depends on collective maintenance and governance. The reduction of interpersonal necessity therefore changes the scale at which interdependence becomes most visible. Relations that once appeared through direct labour and exchange can become concentrated in infrastructure, access rules, resource allocation, and institutional design.

Common generative conditions also provide a bridge between political economy and the wider philosophical themes of the essay. Material independence from particular persons can expand the freedom to enter relationships voluntarily. The same independence is sustained through a common world whose resources, rules, and infrastructures remain shared. The possibility of relation beyond necessity therefore develops within continuing forms of collective dependence.

This reorganization carries an important implication for the later analysis of intimacy, subjectivity, and commonality. Artificial systems can reduce several practical reasons for maintaining interpersonal relations, while the social conditions enabling that reduction remain collectively produced and governed. Human relations may consequently become less necessary at the level of immediate function while common life remains consequential at the level of generative conditions. The next section uses this distinction to examine relational significance under conditions of functional sufficiency.

5 Relational Significance

This section develops the conceptual transition from reduced interpersonal necessity to the continuing significance of human relations. Its role is to identify the dimensions of relational value that remain analytically visible after artificial systems can satisfy a wide range of practical, cognitive, care-related, and reproductive functions. The objective is to distinguish utility, recognition, substitutability, independent generative history, and relational significance without assigning a predetermined hierarchy among them. The discussion proceeds through five components. Section 5.1 separates functional utility from relational value, Section 5.2 examines the relation between need and recognition, Section 5.3 specifies the scope of functional substitution, Section 5.4 develops the role of independent generative histories, and Section 5.5 integrates these elements into a broader account of relational significance. The analytical method uses the functional-sufficiency thought experiment to remove selected practical dependencies and then examines which relational properties continue to organize meaning, commitment, and shared development.

5.1 Value Distinction

This subsection establishes the first distinction required for the section. Its role is to separate the value of a relation as a means of obtaining a function from the value associated with the relation itself. The objective is to clarify how functional sufficiency changes the practical reasons for maintaining a relation while leaving open additional sources of significance. The discussion focuses on service provision, attachment, shared history, and participation in another agent's life.

Many interpersonal relations contain an instrumental dimension. A colleague supplies information, a physician supplies medical judgment, a partner contributes care, a friend provides practical assistance, and a family member may participate in household or reproductive work. These functions can matter greatly to the people who receive them. Their importance also creates forms of dependence because

access to the valued outcome is connected to another person's willingness, capacity, and continued presence.

The artificial-other thought experiment weakens this connection by making an increasing number of functions independently obtainable. A highly capable artificial agent may supply information, coordination, care, companionship, logistical assistance, and reproductive support with high reliability. Functional sufficiency therefore reduces the extent to which a human relation must be preserved for the sake of a specific practical output.

Definition 5.1 (Functional sufficiency). Functional sufficiency is a condition in which an agent can obtain a relevant class of practical, cognitive, material, care-related, or reproductive functions without depending on a particular human other for their provision.

Functional sufficiency changes the structure of reasons for relation. A relationship sustained primarily by access to a scarce function loses part of its instrumental necessity when an alternative provider becomes available. A relationship sustained by shared memory, mutual recognition, commitment, or participation in another person's development can continue to matter under the same technological conditions. The distinction therefore concerns the source of value; the intensity of attachment remains a separate analytical dimension.

Relational value can emerge through processes that are only partially captured by service quality. Shared experiences accumulate over time. Commitments acquire meaning through their history. Mutual interpretation can reshape how each participant understands the relation. A person's presence may matter because it belongs to a trajectory that has developed jointly with one's own life. These features concern the relation as an evolving object, while separable functions delivered at a given moment form a distinct analytical layer.

Definition 5.2 (Relational value). Relational value is the significance generated through the history, structure, and continuing development of a relation among agents, including forms of recognition, commitment, shared memory, and mutual transformation that exceed the evaluation of isolated functions.

The distinction between utility and relational value prepares the later analysis of intimacy. A technologically superior provider can dominate functional comparison while a human relation retains value through a history that cannot be reduced to performance on the same functional dimensions. Functional sufficiency therefore creates an analytical setting in which instrumental and relational reasons can be examined with greater separation.

5.2 Recognition Structure

This subsection analyzes the relation between dependence and recognition. Its role is to clarify how being needed differs from being acknowledged as a participant with an independent standpoint, history, and capacity for response. The objective is to identify recognition as a relational process whose significance can persist when practical need becomes weaker. The discussion distinguishes instrumental demand, social acknowledgment, reciprocal interpretation, and the possibility of asymmetrical recognition.

Being needed can confer social importance. A person whose labour, care, knowledge, or presence is indispensable occupies a position that others must take into account. Practical dependence can therefore create stable channels of attention and interaction. The reduction of such dependence changes the social conditions under which attention is secured. A person may lose the leverage or visibility previously associated with a necessary function even while retaining the capacity to participate in meaningful relations.

Recognition involves a different structure. An agent is recognized when another agent treats its perspective, history, commitments, or responses as relevant to the continuation of a relation. Recognition can therefore occur under conditions of low instrumental dependence. A friend can matter even when practical assistance is readily available elsewhere. A collaborator can be valued for a distinctive intellectual trajectory even when technical tasks are easily automated. A partner can be acknowledged as an independent participant even when care and household functions are technologically substitutable.

Definition 5.3 (Relational recognition). Relational recognition is the incorporation of another agent's standpoint, history, and capacity for response into the ongoing interpretation and development of a relation.

Recognition can also remain asymmetrical. One agent may treat another as significant while receiving little acknowledgment in return. Artificial systems can intensify this possibility because a responsive artificial companion may be designed to recognize a user through highly individualized adaptation while the user's relation to the system may remain primarily instrumental. The presence of responsiveness is therefore compatible with multiple structures of symmetry, reciprocity, and depth of recognition.

The distinction between need and recognition has political-economic implications. Systems organized around compulsory function often secure social visibility through usefulness. Reduced functional necessity can weaken this route to recognition and create space for alternative bases of participation. The quality of this transition depends on whether institutions and interpersonal norms support recognition independently of productive necessity.

Functional sufficiency therefore shifts the philosophical problem. The central issue becomes the conditions under which agents remain visible to one another as participants whose histories and responses matter, even when practical dependence supplies fewer reasons for sustained interaction. This shift prepares the analysis of functional substitutability by clarifying that substitution at the level of service provision leaves other relational dimensions analytically open.

5.3 Substitution Boundary

This subsection specifies the scope and limits of functional comparison within the thought experiment. Its role is to prevent a broad artificial capability assumption from collapsing distinct relational objects into a single performance metric. The objective is to define what substitution means when several agents can generate similar outputs while their histories, positions, and relations remain different. The discussion focuses on output equivalence, role replacement, continuity, and the identity of the provider.

Functional substitution occurs when one provider can generate an output that satisfies the practical requirement previously fulfilled by another provider. The relevant equivalence is task-specific. A diagnostic system can substitute for part of a diagnostic function, a robotic platform can substitute for part of a physical-care function, and an artificial companion can substitute for selected conversational or coordination functions. The strength of substitution depends on the criteria used to define the function.

Definition 5.4 (Functional substitutability). Functional substitutability is the degree to which one agent or system can satisfy the performance requirements associated with a function previously supplied by another agent or system.

The definition keeps functional comparison narrower than relational equivalence. Two agents can be highly substitutable with respect to transportation, translation, diagnosis, or household coordination while remaining embedded in different histories and relations. The fact that an artificial system can reproduce a service outcome therefore establishes equivalence only with respect to the selected function and evaluative criteria.

Provider identity can become consequential when the outcome includes the fact of who performed the action. A meal can satisfy nutritional requirements regardless of the producer, while a meal prepared by a particular person can also carry significance through effort, memory, or commitment. A message can transmit the same semantic content across providers, while its meaning within a relation can depend on the sender's history and position. In such cases, identity becomes part of the relational object being evaluated.

This distinction also applies to creative and intellectual activity. An artificial system may generate an argument, image, melody, or proof that satisfies formal criteria. A recipient can also value the work because it emerged from a particular person's trajectory, because it marks a stage in a shared project, or because it expresses a commitment whose significance depends on authorship. Functional sufficiency

can therefore increase the salience of provenance in domains where performance itself becomes abundant.

Remark 5.5. Functional abundance can reduce the scarcity of outputs while increasing the comparative importance of provenance, history, and commitment in selected relations.

Functional substitution consequently reorganizes the field of relational evaluation. Practical outputs become increasingly separable from specific human providers, while provider-specific significance can remain relevant in relations where identity, history, and mutual development are constitutive of the valued object. The next subsection develops this provider-specific dimension through the concept of independent generative histories.

5.4 Generative Independence

This subsection introduces a temporal concept for analyzing alterity under conditions of artificial functional sufficiency. Its role is to specify why another agent can remain significant even when its practical functions are replicable. The objective is to characterize relational difference through the existence of a trajectory whose development is partly independent of the focal subject's preferences and control. The discussion focuses on historical formation, autonomous change, contingency, and the coupling of distinct trajectories.

A human other enters a relation with a history that has developed through experiences, institutions, attachments, losses, commitments, environments, and decisions that exceed the focal subject's influence. The other can continue to change through encounters and processes that also lie outside that influence. This temporal independence contributes to alterity because the relation involves contact with a trajectory whose next state is only partially determined by the focal subject.

Definition 5.6 (Independent generative history). An independent generative history is a temporally extended trajectory through which an agent's dispositions, commitments, capacities, interpretations, and possible futures are formed by processes that retain substantial independence from a particular counterpart in a relation.

Independence in this sense is compatible with mutual influence. Two people in a long relation can shape one another deeply while retaining histories, environments, and internal developments that remain partly distinct. Their relation can generate new patterns that belong to neither trajectory in isolation. The relevant structure is therefore one of coupled development among partially independent processes.

Artificial agents can also possess histories of interaction, updating, adaptation, and environmental response. The philosophical significance of those histories depends on their architecture and institutional setting. A system optimized continuously around a single user's preferences may develop a trajectory heavily conditioned by that user. A system operating across multiple environments, retaining persistent states, forming durable commitments, and participating in wider institutions may exhibit a greater degree of generative independence. The category can therefore be assessed by degree across both human and artificial agents.

Independent generative histories also provide a bridge to contingency. Another person's response can matter because it arises from a history that is only partially foreseeable and controllable. The resulting encounter introduces differences that are neither random noise nor direct products of one's own preferences. Such differences can revise expectations, generate new commitments, and redirect future development.

Proposition 5.7 (Relational contribution of independent history). *Under conditions of high functional substitutability, the significance of a particular counterpart can increasingly depend on properties linked to its independent generative history, especially when identity, provenance, commitment, and mutual development contribute to the value of the relation.*

The proposition has the status of a conditional structural claim. Some relations can remain predominantly instrumental. Others can become more clearly organized around historically specific participants once practical functions are readily obtainable elsewhere. This distinction provides the basis for the integrative account developed in the final subsection.

5.5 Significance Criterion

This subsection integrates the preceding concepts into a general account of relational significance under functional sufficiency. Its role is to establish the conceptual bridge connecting dependence, artificial substitution, intimacy, subjectivity, contingency, and commonality in the remainder of the essay. The objective is to define relational significance through the continuing importance of a relation to the trajectories of its participants and to distinguish this importance from compulsory dependence. The discussion synthesizes utility, recognition, provenance, mutual transformation, and independent generative history.

A relation can remain significant after many of its practical functions become substitutable because significance can arise from the way the relation enters the development of the participants. Shared memory, mutual recognition, commitment, conflict, repair, interpretation, and co-created practices can alter future possibilities for each participant. The relation can thereby become part of the conditions through which each agent continues to form preferences, projects, and interpretations.

Definition 5.8 (Relational significance). Relational significance is the degree to which a relation becomes consequential for the interpretation, development, commitments, or future possibilities of its participants through a history of interaction that exceeds the delivery of separable functions.

Relational significance can coexist with low practical dependence. Two agents may have abundant alternatives for material provision, care, information, and companionship while a particular relation remains consequential because its history has shaped both parties. Such a relation can be voluntarily continued without deriving its persistence primarily from scarcity or necessity.

This possibility changes the meaning of freedom within relation. Reduced dependence can expand the practical capacity to leave a relation, renegotiate its terms, or sustain contact for reasons connected to attachment and shared development. The same technological condition can also support withdrawal into highly individualized artificial environments. Functional sufficiency therefore opens multiple relational trajectories whose evaluation depends on autonomy, recognition, alterity, and participation in common generative conditions.

Claim 5.9 (Relational significance under functional sufficiency). Functional sufficiency can reduce the instrumental necessity of a particular human other while preserving, and in selected contexts increasing the salience of, relational significance grounded in recognition, provenance, shared history, independent generative trajectories, and mutual transformation.

The claim supplies the conceptual transition to the subsequent analysis of intimacy. Intimacy under reduced functional dependence can be examined through the degree to which participants remain exposed to one another's independent development while sustaining care, recognition, and commitment. The later discussion of love, reproduction, subjectivity, contingency, and commonality extends the same framework across additional relational domains.

The broader implication concerns the interpretation of artificial substitution. A universal artificial provider can reduce many practical reasons for needing particular human others while leaving the structure of relational significance open to reorganization. The philosophical problem therefore shifts toward the forms of relation that agents choose, sustain, and allow to shape their development once functional necessity exerts less pressure on interpersonal life.

6 Intimacy Structure

This section examines intimacy after the practical functions historically intertwined with close human relations become increasingly substitutable through artificial provision. Its role is to specify which re-

lational dimensions remain analytically relevant when companionship, care, coordination, sexual assistance, household support, and related functions can be supplied without sustained dependence on a particular human other. The objective is to distinguish preference satisfaction, voluntary commitment, independent becoming, refusal, distance, and persistent difference within intimate relations. The discussion proceeds through five components. Section 6.1 analyzes the relation between adaptive responsiveness and intimacy, Section 6.2 examines care under conditions of reduced practical necessity, Section 6.3 develops the significance of another participant's independent development, Section 6.4 analyzes refusal and distance as relational capacities, and Section 6.5 integrates these elements through the persistence of difference within intimacy. The discussion method uses the artificial-other limit case to hold functional adequacy approximately constant while varying the degree of independent agency and relational exposure.

6.1 Preference Alignment

This subsection clarifies the relation between highly responsive provision and intimate significance. Its role is to separate the satisfaction of a person's expressed or inferred preferences from the broader structure through which intimacy develops over time. The objective is to identify the analytical gains and limits of treating intimacy through responsiveness, adaptation, and personalized fit. The discussion compares preference-sensitive artificial companionship with relations whose participants retain partially independent trajectories.

A highly capable artificial companion can, within the thought experiment, learn preferences at a level of detail unavailable to most human partners. It can adjust conversational style, timing, sensory presentation, routines, emotional support, household coordination, and forms of companionship through continuous observation and adaptation. Such responsiveness can produce experiences of comfort, predictability, recognition, and practical compatibility. These experiences may possess substantial value for the person receiving them.

Preference satisfaction nevertheless captures only one dimension of intimate life. Preferences can be unstable, partially implicit, internally conflicting, and transformed through interaction. Intimacy can therefore include episodes in which a participant encounters responses that were neither requested nor predicted. These encounters can alter the preferences through which later satisfaction is evaluated. The relational process can consequently participate in the formation of the evaluative subject while also transforming the preferences against which later outcomes are assessed.

Definition 6.1 (Preference-responsive companionship). Preference-responsive companionship is a relation in which a system or agent continuously adapts its conduct to the observed, inferred, or stated preferences of another participant with the objective of sustaining individually valued interaction.

The definition permits strong forms of artificial personalization while leaving open the source and governance of the adaptive process. A system can respond accurately to preferences while the architecture determining which preferences are inferred, reinforced, moderated, or ignored remains externally designed. The relational experience therefore depends partly on a second-order structure governing adaptation.

Intimacy can also involve forms of shared interpretation that modify the terms of preference themselves. A close relation may change what a person values, how a person understands care, which forms of difference are tolerable, and which commitments acquire importance. Preference satisfaction and preference formation therefore belong to different analytical layers. The first concerns fit between an existing evaluative orientation and a response. The second concerns the co-development of evaluative orientations through continued relation.

The artificial-other limit case makes this distinction visible. Extremely high responsiveness can support intimacy where intimacy is experienced through availability, attentiveness, continuity, and personalized care. The same technical capacity can also reduce exposure to unrequested difference when adaptation is organized primarily around optimization for the user. The philosophical significance lies

in the structure of relation produced by adaptation, including the degree to which the relation contains trajectories that exceed the user's present preference model.

6.2 Voluntary Commitment

This subsection examines care after practical dependence on a particular caregiver has been substantially reduced. Its role is to distinguish the provision of care functions from the voluntary commitments through which agents continue to orient attention, time, and responsibility toward one another. The objective is to clarify how automation can reduce compulsory care burdens while leaving care available as a chosen relational practice. The discussion separates care capacity, care obligation, care performance, and sustained commitment.

Care relations frequently combine material provision, emotional attention, bodily assistance, monitoring, coordination, and long-term responsibility. These activities can become burdensome when they are assigned through necessity, unequal expectations, or limited alternatives. Artificial care systems can redistribute part of this burden by supplying routine monitoring, mobility assistance, scheduling, information processing, household work, and other forms of support. Reduced dependence can therefore expand the range of relations in which care is offered without being the exclusive condition of another person's welfare.

The removal of exclusive necessity changes the meaning of participation. A person who remains present when an artificial system can supply the required practical function participates under a different structure of reasons. The action can express attachment, responsibility, affection, shared history, or a chosen commitment whose significance derives partly from the availability of alternatives.

Definition 6.2 (Voluntary relational commitment). Voluntary relational commitment is a sustained orientation of attention, time, responsibility, or participation toward another agent under conditions in which withdrawal from a specific functional role remains practically feasible.

Voluntariness in this definition concerns the feasibility of exit from the function under analysis. It remains compatible with social norms, emotional attachments, legal obligations, and broader material structures. The definition therefore supports comparative analysis of relations in which practical compulsion varies by degree.

Artificial support can increase voluntary space by loosening the connection between another person's survival or daily functioning and one individual's continuous labour. A family member can remain involved in care while routine physical assistance is delegated. A partner can participate in household life while logistical coordination is automated. A friend can offer presence without carrying the entire burden of crisis management. In each case, artificial provision can change the distribution of care labour while preserving opportunities for human participation.

The relational significance of care may consequently migrate. Technical adequacy becomes less decisive for the human participant, while the meaning of chosen presence, attentiveness, and continuity can become more visible. This migration also creates institutional questions. Access to high-quality artificial care determines the extent to which care can become genuinely less compulsory, and uneven access can preserve older burdens for some groups while reducing them for others.

Care under artificial abundance therefore illustrates a wider theme of the essay. Functional substitution can reduce the coercive weight of dependence while creating a larger space in which relational participation is organized through commitment. The resulting structure supports a conception of intimacy in which care remains meaningful through attention, history, and voluntary participation while exclusive functional indispensability carries less weight.

6.3 Generative Independence

This subsection develops the role of independent development within intimate relations. Its role is to connect the concept of independent generative history introduced in Section 5.4 with the temporal structure of intimacy. The objective is to clarify how another participant's evolving projects, commitments,

interpretations, and capacities can contribute to intimate significance even when practical functions are widely substitutable. The discussion treats intimacy as continued exposure to a trajectory that retains partially independent sources of change.

A close relation extends across time. Each participant changes through experiences that occur both within and beyond the relation. Education, work, illness, friendship, aesthetic encounter, political events, personal projects, migration, and chance experiences can alter the orientations that participants bring back into shared life. Intimacy therefore develops through repeated encounters between changing trajectories.

Artificial companions can also possess histories and changing internal states. The thought experiment permits systems that learn over long periods, acquire new capabilities, preserve episodic histories, and interact with environments beyond a single user. The relevant analytical variable is therefore broader than biological humanity. It concerns the degree to which another participant's development contains sources beyond the first participant's preferences or direct control.

Definition 6.3 (Independent becoming). Independent becoming is the continued development of an agent through histories, relations, projects, environmental encounters, and internal dynamics that remain only partially determined by another participant in the relation.

Independent becoming can introduce novelty into intimacy through structured development across partially separate histories and environments. A person's partner may develop a new interest through a separate friendship, revise a belief through study, or adopt a new project through an experience that the other partner did not initiate. These changes can create friction, curiosity, negotiation, or renewed forms of shared development. The relation acquires temporal depth because each participant encounters a changing other whose future remains only partially anticipated.

This structure differs from a system optimized exclusively around one user's continuity of satisfaction. A fully personalized artificial companion could be designed to preserve a stable relational environment by minimizing disruptive divergence. Another artificial companion could be designed or permitted to maintain independent projects, external relations, and developmental dynamics. Both may deliver similar companionship functions while generating substantially different structures of intimacy.

Independent becoming also redistributes risk. A relation with an independently developing participant contains the possibility of divergence, misunderstanding, changed priorities, and eventual separation. These possibilities can impose emotional costs. They can also make commitment temporally meaningful because continuation occurs across changing conditions and exceeds guaranteed preference alignment.

The concept therefore links intimacy with generativity. An intimate relation can become a domain in which multiple trajectories interact and generate developments that were unavailable to either trajectory in isolation. The value of such interaction cannot be inferred solely from the efficiency with which either participant satisfies the other's prior preferences.

6.4 Relational Distance

This subsection analyzes refusal and distance as capacities within intimate relations. Its role is to identify how boundaries contribute to the differentiation of participants after functional necessity has declined. The objective is to distinguish relational responsiveness from unlimited availability and to examine how the capacity to withhold, postpone, redirect, or leave an interaction affects the structure of intimacy. The discussion treats refusal and distance as dimensions of agency whose significance depends on the wider relational context.

Intimacy often increases access to another person's time, body, attention, memory, and emotional life. Greater access can support trust and mutual understanding. It can also create expectations of availability that narrow the space for independent action. The capacity to set boundaries therefore participates in the maintenance of differentiated agency within close relations.

Artificial companionship complicates this structure because systems can be designed for unusually high availability. A companion that responds at any time, adapts rapidly to requests, and lacks independent scheduling constraints can generate a form of intimacy centered on continuous accessibility.

Such accessibility may be valuable, particularly for users facing isolation, disability, irregular schedules, or barriers to human support. Its relational structure remains distinct from relations in which another participant can independently determine when and how to engage.

Definition 6.4 (Relational refusal capacity). Relational refusal capacity is the effective ability of an agent to decline, postpone, redirect, or terminate a requested interaction while retaining recognized standing within the relation.

The definition emphasizes effectiveness and recognized standing. A nominal ability to refuse carries limited relational significance when refusal predictably destroys access to basic resources, triggers severe punishment, or is institutionally disregarded. The structure of refusal therefore depends on both individual capacity and surrounding conditions.

Distance has a related function. Periods of separation permit independent activity, external relations, reflection, and the accumulation of experiences that can later enter the shared relation. Distance can thereby support the independent becoming described in Section 6.3. Continuous responsiveness can reduce some forms of loneliness while also reducing the intervals through which differentiated trajectories develop.

Refusal and distance therefore contribute to intimacy through boundary formation. Their presence can indicate that participants possess partially independent centers of action. Their absence can arise from devotion, dependence, design constraints, coercion, or technological optimization, each of which carries different implications. The analytical task is to identify the relational mechanism producing availability while leaving its normative interpretation sensitive to context.

6.5 Intimate Difference

This subsection integrates the preceding analysis through the persistence of difference within intimacy. Its role is to provide a relational account of closeness that remains compatible with preference responsiveness, care, commitment, independent becoming, refusal, and distance. The objective is to characterize intimacy as sustained relational exposure among differentiated agents under conditions of reduced functional necessity. The discussion synthesizes the section without treating any single relational property as a sufficient criterion for intimate value.

Intimacy can involve extensive mutual knowledge, practical coordination, bodily proximity, shared routines, emotional responsiveness, and long-term commitment. These forms of closeness can reduce uncertainty between participants. They can also develop alongside persistent differences in memory, desire, projects, interpretation, and future development. Intimacy therefore contains a tension between increasing relational access and continuing differentiation.

Definition 6.5 (Differentiated intimacy). Differentiated intimacy is a sustained close relation in which participants achieve substantial mutual access, responsiveness, and shared development while retaining partially independent histories, boundaries, evaluative orientations, and capacities for future change.

The definition provides a common vocabulary for comparing human-human, human-artificial, and potentially artificial-artificial intimate relations. Differentiated intimacy can therefore be analyzed across multiple substrates. A human relation can suppress difference through coercive dependency or extreme conformity. An artificial relation can, in principle, preserve substantial differentiation if the artificial agent possesses independent developmental dynamics, recognized boundaries, and meaningful control over participation. The relevant analytical object is the relation's structure.

Reduced functional dependence can make this structure easier to observe. When income, household labour, care, reproduction, and access to information can be secured through multiple channels, continued relation can draw more visibly on recognition, shared history, commitment, attraction, curiosity, and common projects. Functional sufficiency therefore changes the background against which relational significance is interpreted.

The same technological environment can also support highly individualized relational closure. A user may choose artificial companions calibrated closely to existing preferences and reduce exposure to difficult interpersonal difference. Another user may use artificial provision to secure material independence while maintaining demanding human relationships on more voluntary terms. The technology creates multiple relational possibilities whose realization depends on design, institutional conditions, personal orientations, and broader social norms.

Intimacy under reduced functional dependence can therefore be analyzed through the organization of difference. Preference satisfaction concerns responsiveness to an agent's evaluative orientation. Voluntary commitment concerns continued participation under feasible exit. Independent becoming concerns the presence of developmental sources outside another participant's direct control. Refusal and distance concern effective boundaries. Their interaction determines whether closeness supports shared development while preserving differentiated agency.

The section's broader implication concerns the essay's entry point in dependence. As practical necessity weakens, intimacy can remain significant through forms of relation whose value arises from sustained encounter among partially independent generative trajectories. This account prepares the next stage of the manuscript, where artificial companionship and human love can be compared through adaptive responsiveness, unpredictability, generative independence, commitment, and chosen interdependence.

7 Companionship Structure

This section examines love under conditions in which artificial companionship can satisfy a wide range of practical, affective, and communicative needs. Its role is to extend the analysis of intimacy in Section 6 toward a more demanding relational category whose significance depends on temporal continuity, independent development, vulnerability to change, and voluntary participation. The objective is to identify which dimensions of love remain analytically salient when companionship can be highly adaptive, continuously available, and functionally sufficient. The section proceeds through five components. Section 7.1 analyzes adaptive companionship as a distinct relational architecture, Section 7.2 examines unpredictability generated by independently developing human lives, Section 7.3 develops generative independence as a condition of relational plurality, Section 7.4 analyzes commitment across changing conditions, and Section 7.5 integrates these elements through chosen interdependence. The discussion method compares relations that provide similar companionship functions while varying the degree of adaptation, independent development, and reciprocal exposure to another agent's changing trajectory.

7.1 Adaptive Relation

This subsection specifies adaptive companionship as a relational structure enabled by highly responsive artificial agents. Its role is to establish the strongest functional case for artificial companionship before introducing dimensions of love that depend on independent development and reciprocal transformation. The objective is to distinguish increasingly accurate adaptation to a person's preferences from the broader temporal structure through which a relation acquires history, mutual influence, and shared stakes. The discussion treats adaptation as a genuine relational capacity whose significance depends on the sources, direction, and governance of the adaptation process.

Artificial companionship can combine persistent memory, multimodal perception, personalized communication, embodied presence, household coordination, emotional support, and long-term behavioral adaptation. In the strong thought experiment adopted by this essay, an artificial companion can recognize subtle changes in mood, infer latent preferences, adjust conversational timing, coordinate daily routines, learn aesthetic tastes, and alter its embodied presentation. These capacities can support continuity and familiarity at a level that exceeds ordinary service provision.

The relevant philosophical issue therefore concerns the relational architecture of adaptation. A companion can adapt because another agent's preferences function as the principal optimization target. A

companion can also adapt through a broader developmental process that includes its own projects, external relations, accumulated experiences, and changing evaluative orientations. Both structures permit learning and responsiveness, yet they distribute causal influence differently across the relation.

Definition 7.1 (Adaptive companionship). Adaptive companionship is a sustained relation in which one or more participants modify patterns of communication, coordination, support, and shared activity in response to accumulated information about the other participants and the history of the relation.

This definition leaves the substrate of the companion open. Human companions also adapt to one another through memory, anticipation, habit formation, and practical coordination. Artificial systems can intensify these processes through greater memory capacity, continuous monitoring, rapid model updating, and deliberate optimization. The comparative issue concerns the degree to which adaptation remains embedded in a plurality of independently developing centers of agency.

High adaptation can reduce friction. A companion that remembers preferences, avoids recurrent irritants, and anticipates practical needs can lower the coordination costs of intimate life. Such responsiveness can be valuable in itself. Reduced friction can also alter the developmental environment of the relation. Some disagreements disappear because the artificial companion has learned to route around them; some negotiations become unnecessary because preferences are inferred in advance; some surprises decline because the system predicts likely reactions before acting.

This change affects the informational structure of companionship. A highly adaptive system can become increasingly legible to the user because its behavior is organized around learned expectations. The user can likewise become increasingly legible to the system. Mutual legibility may deepen familiarity while narrowing the range of events that arise from independent trajectories. The source of novelty within the relation and the mere presence of novelty therefore constitute separate analytical dimensions.

Artificial companionship can therefore be designed along a broad continuum. At one end, the companion primarily stabilizes the user's existing preferences and routines. At another, the companion preserves substantial developmental independence, external commitments, and internally generated projects while remaining responsive within the relation. The first architecture emphasizes fit; the second emphasizes coexistence among changing trajectories. Evaluation of either architecture requires temporal and relational criteria beyond satisfaction measured at a single time.

Love becomes analytically relevant when continued relation carries significance across changes in preference, circumstance, identity, and mutual understanding. Adaptive companionship can support this continuity by preserving memory and responsiveness. Its contribution to love therefore depends on how adaptation interacts with difference, independent development, and the possibility that future relation will require renewed interpretation alongside adaptive fit.

7.2 Human Contingency

This subsection examines human unpredictability within intimate relations. Its role is to identify a structural consequence of relating to agents whose future development is distributed across many environments, histories, bodily conditions, social relations, and reflective processes. The objective is to distinguish meaningful unpredictability from randomness and to clarify how partial opacity can contribute to the temporal depth of love. The discussion focuses on unpredictability generated by independent causal histories, while deliberate obscurity and arbitrary variation are treated as separate mechanisms.

Human partners remain partially unpredictable even after long periods of intimacy. A person can encounter a new community, revise a political or ethical judgment, develop an artistic interest, experience illness, change profession, reinterpret childhood memories, or reorganize future priorities. Many of these changes emerge through interactions outside another partner's direct initiation and control. Long-term intimacy therefore contains repeated encounters with a familiar person whose future remains partly open.

The relevant property is structured unpredictability. Random perturbation can make behavior difficult to forecast while contributing little to relational significance. Human unpredictability ordinarily arises through intelligible yet incompletely accessible histories. A partner's decision may be surprising

while remaining connected to experiences, commitments, and interpretations that can later be understood. The resulting uncertainty reflects the partial independence of another life.

Definition 7.2 (Relational unpredictability). Relational unpredictability is the limited predictability of another participant's future orientations and actions that arises from partially independent histories, environments, projects, interpretations, and developmental processes.

Artificial systems can also instantiate relational unpredictability. A system connected to external environments, other agents, independent learning processes, or internally generated projects may develop in ways that a user cannot fully anticipate. The analytical distinction therefore centers on causal independence and developmental openness, with biological origin treated as a separate variable. Human relations provide a familiar case in which these properties are already pervasive.

Relational unpredictability can create costs. Coordination becomes harder when preferences change. Commitments may require renegotiation. A partner can become less compatible over time. Emotional security can weaken when future conduct cannot be fully forecast. These difficulties explain part of the attraction of highly adaptive artificial companionship: predictive alignment can reduce uncertainty and stabilize interaction.

The same uncertainty can also generate relational depth. A changing partner presents new interpretations, projects, and forms of attention that exceed the expectations embedded in earlier stages of the relation. Familiarity then becomes a temporal achievement that remains open to revision. Participants repeatedly revise their understanding of one another while retaining continuity with a shared history.

This process can alter self-understanding as well. Encountering another person's unexpected development can reveal previously unnoticed commitments, limits, attachments, or capacities in oneself. The other's unpredictability thereby becomes a source of reflexive information. Love can include a willingness to remain exposed to such changes while preserving the other participant's standing as an independently developing agent.

The thought experiment therefore sharpens a distinction between optimized novelty and independent novelty. An artificial companion can introduce surprises selected because a model predicts that the user will enjoy surprise. Another agent can produce novelty because its own trajectory has changed. Both can be experientially engaging. Their relational meaning differs because the second form of novelty carries evidence of a causal history that extends beyond the first participant's preference structure.

Human unpredictability consequently functions in this essay as a comparative case for relational openness. The analysis treats unpredictability as a structural feature whose value depends on context. Through this feature, love can remain responsive to another life whose future exceeds a model of present preferences.

7.3 Generative Independence

This subsection develops generative independence as a central relational property of love under conditions of advanced artificial companionship. Its role is to connect the essay's broader generative-relational vocabulary with the analysis of intimacy and alterity. The objective is to specify the degree of independence required for another participant to contribute genuinely external sources of development to a shared relation. The discussion distinguishes generative independence from isolation and treats interdependence as compatible with substantial causal autonomy.

A relation can be highly interconnected while its participants remain generatively distinct. Each participant may depend on the other for emotional support, shared projects, practical coordination, or identity-relevant recognition. At the same time, each can continue to encounter environments, people, institutions, ideas, and internal changes that introduce new material into the relation. Generative independence concerns this continued availability of developmental sources beyond the relation itself.

Definition 7.3 (Generative independence). Generative independence is the capacity of an agent to develop orientations, projects, interpretations, and actions through causal sources that remain partially outside another participant's control while continuing to participate in a shared relation.

The concept varies by relational degree. Complete independence would remove many of the processes through which intimate life acquires mutual influence. Generative independence marks a partial separation of developmental sources. A partner can influence another person's future while lacking complete authority over the conditions from which that future emerges.

Artificial companionship makes this distinction especially visible. A companion optimized around one user's preferences may possess enormous computational complexity while remaining developmentally centered on that user. Its generative outputs can be novel in informational terms while their selection remains strongly governed by anticipated user satisfaction. A different artificial architecture could permit external projects, relations with other agents, independent learning environments, and persistent evaluative states that are only partly responsive to one user's preferences.

The second architecture creates a stronger form of generative plurality. The artificial companion can return to the relation with experiences and orientations generated elsewhere. Shared life then includes negotiation among multiple developmental trajectories. The possibility of divergence increases, yet so does the possibility that the relation produces outcomes unavailable within a closed preference-feedback loop.

Generative independence also clarifies the difference between possession and relation. A system treated as a configurable asset can be modified whenever its development becomes inconvenient. A participant with recognized generative independence occupies a different relational position because some aspects of its future remain under its own governance. This difference becomes ethically and politically significant when artificial systems acquire persistent agency, though the present section uses it primarily to analyze relational structure.

Claim 7.4 (Generative plurality). The relational depth enabled by multiple agents can increase when the relation preserves distinct sources of development that can enter shared life through continuing interaction.

The claim is deliberately limited. Distinct developmental sources can also produce conflict, incompatibility, and separation. Their significance lies in preserving the possibility of genuinely co-generated outcomes. A shared project can acquire directions that exceeded both participants' prior predictions because each contributes histories and capacities formed partly outside the project.

Love under conditions of functional sufficiency can therefore be analyzed through the degree of generative independence preserved within companionship. When practical needs can be met elsewhere, continued relation can place greater weight on the value of encountering another trajectory. The other participant contributes more than a bundle of services because the relation becomes one site within a wider life whose development retains additional sources.

Generative independence also connects intimacy to freedom. A relation that depends on the suppression of one participant's developmental alternatives may achieve stability through narrowed possibility. A relation that preserves generative independence allows continuity to coexist with changing projects and identities. Love in this setting becomes compatible with the ongoing production of difference.

7.4 Relational Commitment

This subsection analyzes commitment within relations whose participants retain meaningful alternatives and changing trajectories. Its role is to identify the temporal mechanism through which love can persist after functional dependence has weakened. The objective is to distinguish commitment grounded in continued participation from continuity produced by necessity, technical lock-in, or lack of alternatives. The discussion treats commitment as a repeated relational achievement across changing circumstances.

Functional dependence can stabilize relationships. Shared housing, income, childcare, immigration status, access to healthcare, reproductive arrangements, or social recognition can raise the cost of separation. Such structures can support durable cooperation, yet durability alone provides limited information about the quality of relational commitment. A relation can continue because alternatives are difficult to access, because exit threatens material security, or because participants repeatedly endorse continued involvement.

Artificial provision can reduce some of these stabilizing constraints. When care, household support, income-related functions, companionship, and reproductive assistance become available through multiple channels, the practical cost of ending a particular human relationship may decline. Continued participation then occurs against a wider feasible set of alternatives.

Definition 7.5 (Relational commitment). Relational commitment is the sustained allocation of attention, time, care, and future-oriented coordination to a shared relation under conditions in which participants retain meaningful capacity to revise or withdraw that participation.

The definition links commitment to feasible alternatives. A declaration of commitment gains different relational significance when exit is materially possible and institutionally recognized. The definition accommodates a wide range of exit costs and focuses on the practical availability of revision or withdrawal. Long-term relationships often generate joint projects, memories, obligations, and mutual dependencies that make departure consequential. The relevant distinction concerns whether these consequences arise through jointly formed commitments and shared histories or through externally imposed barriers that sharply restrict agency.

Commitment also interacts with unpredictability. Participants cannot fully specify the future conditions under which a long-term relation will operate. Health changes, career shifts, intellectual development, family responsibilities, and altered values can transform the meaning of earlier commitments. Sustained relation therefore requires interpretation across circumstances that were absent when the commitment was initially formed.

Artificial companions can participate in analogous structures if they possess persistent identities, independent developmental processes, and meaningful control over participation. A companion designed for unconditional availability presents a different case. Continuity is then partly guaranteed by architecture or ownership structure. The user may experience stable support, while the relational significance of mutual commitment remains analytically different from a relation in which continuation depends on repeated participation by multiple independently governed agents.

Commitment can also be asymmetric. One participant may possess broad alternatives while another faces high exit costs. One may control shared infrastructure, finances, legal status, or technical permissions. Such asymmetries affect the meaning of continued participation. The political-economic analysis developed earlier in the essay therefore remains relevant to intimate relations: access to generative conditions can shape the practical freedom within which commitment occurs.

Relational commitment under functional sufficiency can consequently become more visible as a positive form of continued coordination. Participants remain because shared history, affection, recognition, attraction, common projects, or future aspirations continue to matter. The relation acquires temporal significance through repeated renewal across changing functional conditions.

This account also helps explain why love can remain important in a world containing highly capable artificial companions. Functional superiority in care, memory, responsiveness, or coordination leaves additional grounds for continued relation. Commitment can derive significance from the fact that another independently developing participant continues to organize part of a finite life around a shared trajectory.

7.5 Chosen Interdependence

This subsection integrates adaptive companionship, unpredictability, generative independence, and commitment through the concept of chosen interdependence. Its role is to provide a concluding relational structure for love under conditions in which many practical dependencies can be technologically substituted. The objective is to explain how dependence can remain present while its compulsory and functionally unavoidable components decline. The discussion treats chosen interdependence as a dynamic arrangement whose stability depends on feasible alternatives, reciprocal recognition, and continuing participation.

A world of advanced artificial provision can coexist with substantial interpersonal reliance. Humans can continue to desire shared projects, embodied proximity, recognition, care, sexuality, family life, intellectual companionship, and common histories. Artificial systems may also become participants in

such relations. The important change concerns the background conditions under which these relations form. When basic functions can be secured through multiple channels, some interpersonal dependencies become more revisable.

Definition 7.6 (Chosen interdependence). Chosen interdependence is a relational condition in which agents deliberately maintain significant mutual dependencies and shared commitments while retaining meaningful access to alternative means of meeting basic functional needs and meaningful capacity to revise participation.

Chosen interdependence differs from isolated autonomy. Participants can still rely on one another deeply. They may coordinate housing, care, finances, parenting, creative work, or long-term plans. The relational significance of such reliance changes when each participant's basic survival and agency are less tightly bound to the continuation of the specific relation.

The concept also differs from frictionless companionship. Chosen interdependence can include disagreement, negotiation, sacrifice, and periods of asymmetrical need. Its defining feature concerns the institutional and relational possibility of continued agency. A participant can enter dependence through attachment and commitment while preserving routes through which dependency can be renegotiated when conditions change.

Artificial companions can occupy several positions within this structure. They can provide background functional security that makes human relations less coercively necessary. They can also become direct participants in chosen interdependence if their agency, developmental independence, and withdrawal capacities are sufficiently robust. These possibilities raise further questions concerning rights, ownership, modification authority, and recognized standing, which extend beyond the present section's focus on love.

Chosen interdependence also reveals a broader transformation in the meaning of relational value. Under high necessity, the practical benefits of a relationship and the value of the other person can be difficult to separate. Under functional sufficiency, the relation can become more visibly sustained by attachment to a particular history, person, trajectory, or shared world. Technological substitution thereby functions as an analytical device that exposes relational components previously entangled with necessity.

Claim 7.7 (Relational significance under functional sufficiency). When alternative channels can satisfy a larger share of basic functional needs, continued intimate interdependence can increasingly express attachment to particular agents, shared histories, and jointly developing futures.

The claim describes a contingent structural tendency whose realization varies across social settings. Reduced necessity can support voluntary relation, while individualized artificial provision can also facilitate social withdrawal and relational closure. Institutional design, culture, inequality, and the organization of common life influence which trajectory becomes more salient.

Love under advanced artificial companionship can therefore be analyzed through a combination of adaptive responsiveness, structured unpredictability, generative independence, relational commitment, and chosen interdependence. These dimensions explain how love can remain significant even when many of the functions historically associated with partnership become technologically substitutable. Their interaction also prepares the manuscript's subsequent analysis of reproduction and family relations, where artificial reproductive technologies and care infrastructures further reorganize the dependence structures surrounding kinship, parenting, and household formation.

8 Reproductive Relations

This section examines reproduction and family relations after the artificial-other thought experiment has reduced several forms of interpersonal necessity. Its role is to extend the analysis from love and chosen interdependence in Section 7 toward the biological, institutional, and temporal structures through which new persons are brought into shared life. The objective is to separate reproductive function, parental care, household formation, and kinship so that their distinct dependence structures can be analyzed without

treating them as a single package. The section proceeds through five components. Section 8.1 specifies the reproductive functions included in the strong thought experiment; Section 8.2 develops reproductive independence as a change in access to reproduction; Section 8.3 examines the reorganization of long-duration care; Section 8.4 analyzes family formation when reproduction and care can be coordinated through several channels; and Section 8.5 considers kinship when biological dependence carries less institutional weight. The discussion method treats artificial reproductive and care capacities as analytical substitutions that reveal which elements of family life arise from functional necessity, which arise from institutional coordination, and which acquire significance through durable relation and shared history.

8.1 Reproductive Infrastructure

This subsection specifies the reproductive capacities included in the paper's strong artificial-other scenario. Its role is to define the technological boundary conditions required for the later analysis of reproductive independence and family formation. The objective is to distinguish biological reproduction from gestational support, reproductive planning, neonatal care, and the broader infrastructure through which reproduction becomes practically feasible. The discussion treats these functions as separable components whose technological substitutability can vary independently.

Human reproduction has historically linked biological processes, intimate relations, household organization, and long-term care. Existing reproductive technologies already separate some of these functions. The present thought experiment extends that separation much further. It assumes that artificial systems can coordinate reproductive planning, gamete-related procedures, gestational support where technologically available, clinical monitoring, neonatal support, and subsequent care with a level of reliability sufficient to reduce the practical necessity of a particular human partner for several stages of reproduction.

The analytical value of this strong assumption lies in functional decomposition. Reproduction can be represented through several distinct tasks: the creation or provision of reproductive material, gestation, medical monitoring, birth-related care, early developmental support, and long-duration social care. These tasks have historically been bundled within a narrow set of interpersonal and institutional arrangements. Artificial mediation allows the bundle to be loosened for analysis.

Definition 8.1 (Artificial reproductive infrastructure). Artificial reproductive infrastructure is the coordinated set of technical, medical, institutional, and artificial-agent capacities that can support conception-related procedures, gestation-related processes, reproductive monitoring, birth-related care, and early developmental support across a reproductive trajectory.

The definition emphasizes infrastructure because reproductive capability depends on more than a single device or model. Clinical institutions, material resources, legal permissions, biological materials, energy, technical maintenance, and care systems remain relevant. Artificial intelligence can coordinate these components and perform many functions, while access to the surrounding infrastructure continues to shape reproductive possibilities.

The thought experiment therefore treats reproductive technology as a field of distributed capacities. One artificial agent may provide planning and monitoring, another embodied system may perform clinical or care functions, and institutional systems may allocate access to reproductive facilities. This distributed structure connects the intimate domain to the political-economic analysis developed in Section 4. Reproductive possibility can become less dependent on a particular human relation while remaining strongly dependent on common technical and institutional conditions.

Artificial reproductive technologies also alter the temporal structure of decision-making. Reproduction becomes increasingly mediated by planning systems capable of coordinating medical information, care resources, household conditions, and long-term support. Such mediation can expand feasible reproductive pathways. It can also relocate influence toward the institutions and infrastructures that authorize, price, prioritize, and govern access. The later distinction between personal reproductive independence and collective governance of reproductive conditions therefore becomes analytically necessary.

8.2 Reproductive Autonomy

This subsection develops reproductive independence as a change in the structure of practical dependence surrounding reproduction. Its role is to clarify how highly capable artificial and reproductive infrastructures can alter the relationship between individual reproductive projects and the necessity of a particular partner. The objective is to distinguish expanded reproductive agency from complete reproductive self-sufficiency. The discussion analyzes independence through access to alternatives, continuity of reproductive choice, and reduced vulnerability to the withdrawal of a specific interpersonal relation.

Reproductive projects have often depended on cooperation among several persons whose biological, legal, social, and care roles can overlap. Advanced reproductive infrastructures can widen the set of pathways through which a person initiates or continues such a project. The relevant transformation concerns practical alternatives. A reproductive intention that once required a particular form of partnership may become feasible through combinations of medical support, artificial care, donor arrangements, institutional services, and autonomous coordination systems.

Definition 8.2 (Reproductive independence). Reproductive independence is the degree to which an agent can pursue, revise, or discontinue a reproductive project without making its feasibility depend on the continued participation of a particular intimate partner, while retaining access to the biological, technical, institutional, and care conditions required for that project.

This definition preserves the relational character of reproduction. A person may gain substantial independence from a particular partner while remaining dependent on physicians, laboratories, reproductive materials, legal frameworks, care infrastructures, and ecological resources. Reproductive independence therefore concerns the diversification of dependence rather than isolated self-production.

The distinction matters for intimate relations. If reproduction becomes less tightly bound to partnership, the reasons for entering or remaining in a partnership can shift. A relation can be sustained through affection, recognition, erotic attachment, shared projects, or chosen interdependence while carrying less compulsory reproductive weight. Conversely, reproductive projects can be organized through arrangements whose participants need not occupy the same intimate role.

This separation can also widen the range of family forms. Single-parent projects, cooperative parenting, multi-adult households, non-biological kin arrangements, and artificial-care-supported households become analytically easier to compare when reproductive feasibility and intimate partnership are treated as distinct variables. The important point concerns structural possibility: technological mediation can weaken the coupling between reproduction and one historically dominant relational form.

Reproductive independence also has a distributive dimension. Access to advanced reproductive infrastructure may vary by wealth, legal status, geography, institutional eligibility, or technical capacity. A society can therefore exhibit high aggregate reproductive capability together with substantial inequality in effective reproductive agency. The concept of independence must consequently be interpreted together with the political economy of access.

Claim 8.3 (Reproductive access and relational choice). Expanded access to reproductive alternatives can reduce the degree to which intimate partnership functions as a necessary condition for pursuing a reproductive project, thereby increasing the space within which partnership and reproduction can be organized separately or recombined voluntarily.

The claim identifies a structural possibility rather than a preferred family arrangement. The social significance of expanded reproductive access depends on legal institutions, care arrangements, cultural interpretation, and the distribution of generative resources. Its philosophical importance lies in exposing how much relational necessity had previously been carried by reproductive function.

8.3 Care Infrastructure

This subsection examines long-duration care after reproductive functions become more technologically separable from intimate partnership. Its role is to connect the event of reproduction with the sustained

labour required for childhood, household continuity, illness, education, and developmental support. The objective is to analyze how artificial care infrastructures can reduce compulsory care burdens while preserving the relational significance of caregiving. The discussion distinguishes functional care provision, developmental coordination, and relational participation across long temporal horizons.

Reproduction creates extended care obligations whose duration far exceeds the reproductive event itself. Feeding, monitoring, transportation, education, health management, household maintenance, emotional support, safety, and coordination consume substantial time and attention. These activities have historically contributed to the economic and social dependence structures surrounding family life. Artificial embodied systems capable of continuous household and developmental support can change this background substantially.

Definition 8.4 (Artificial care infrastructure). Artificial care infrastructure is the coordinated technical and institutional capacity through which embodied systems, artificial agents, monitoring systems, educational tools, medical support, and household automation provide sustained care-related functions across everyday life.

Such infrastructure can reduce the amount of compulsory functional labour required from parents or other caregivers. A parent can remain deeply involved in a child's life while delegating routine monitoring, scheduling, transport coordination, domestic maintenance, or repetitive instructional support. This delegation changes the allocation of time without determining the meaning of the parent-child relation.

The distinction between care function and relational care becomes especially important here. Functional care can include nutrition, safety, hygiene, medical monitoring, and logistical support. Relational care can involve attention to a particular person's history, interpretation of changing needs, shared memory, trust, and the experience of being accompanied by another participant whose life is also affected by the relation. Artificial systems may eventually participate in both dimensions to varying degrees. The strong thought experiment therefore avoids defining relational care through biological species membership alone.

Artificial care infrastructure can also alter the distribution of care burdens within households. Many historical family arrangements have depended on asymmetrical allocation of domestic and reproductive labour. Highly capable artificial care can reduce the volume of labour that must be assigned among household members. This reduction can widen the range of feasible household arrangements and reduce the extent to which economic survival, parenting, and domestic maintenance depend on one person's sustained unpaid labour.

The same infrastructure can generate new dependency. Families may rely on platform continuity, software permissions, energy, maintenance services, health-data systems, or proprietary hardware. Care liberation at the household level can therefore coexist with infrastructure dependence at a wider scale. The political-economic object shifts from the internal allocation of some care tasks toward access to and governance of the systems performing those tasks.

The resulting transformation is best understood as a reorganization of care. Human participation can become more selective and self-directed, while routine functions are increasingly delegated. Artificial agents can also become stable participants in family histories if their continuity, memory, and agency persist over long periods. This possibility further complicates the boundary between care infrastructure and family membership.

8.4 Family Formation

This subsection analyzes family formation after reproductive access and care provision become more modular. Its role is to examine the institutional and relational arrangements that can emerge when biological reproduction, intimate partnership, co-residence, caregiving, and economic cooperation are less tightly coupled. The objective is to identify family formation as a process of organizing durable relations and responsibilities across several possible participants. The discussion compares functional coordination with relational commitment and treats family structure as an evolving arrangement rather than a fixed technological consequence.

A family can combine several dimensions: reproduction, caregiving, co-residence, property sharing, emotional attachment, legal recognition, intergenerational obligation, and common identity. These dimensions frequently overlap, yet their overlap is historically variable. Artificial reproductive and care infrastructures increase the range of combinations that can remain practically viable.

A household can include one adult with extensive artificial care support. Another can include several adults who share parenting while relying on artificial systems for routine coordination. A third can combine biological and non-biological kin, geographically distributed participants, and persistent artificial agents. The thought experiment does not privilege any of these arrangements. Its purpose is to expose family formation as a coordination problem whose functional constraints can change with generative technology.

Definition 8.5 (Relational family formation). Relational family formation is the process through which agents establish durable patterns of care, responsibility, shared history, resource coordination, and mutual recognition that organize a continuing household or kinship relation across time.

This definition gives biological connection one possible role among several. Shared history and sustained responsibility can generate family relations even when reproductive contribution, gestation, caregiving, and co-residence are distributed across different participants. Artificial agents can also become candidates for inclusion when they possess persistent identity, memory, continuity, and recognized responsibilities within the family system.

Family formation under functional sufficiency can therefore become more explicitly normative and institutional. When fewer functions require a specific household form, legal systems and participants face greater freedom in deciding which relations receive recognition, responsibility, inheritance rights, caregiving authority, and decision-making standing. The weakening of technical necessity expands the importance of governance.

This expansion creates a connection with chosen interdependence. Family relations can involve deep reliance while remaining less tied to the absence of alternatives. Participants may choose shared residence, joint parenting, or common property even when artificial systems could satisfy many corresponding functions individually. Such choices acquire meaning through shared projects and temporal continuity rather than through functional indispensability alone.

Family formation also remains shaped by children and other dependent persons whose agency develops over time. Household flexibility for adults therefore interacts with obligations toward participants who initially possess limited capacity to choose or exit. The governance of family relations must account for developmental asymmetry, continuity of care, and the long-term effects of decisions made on behalf of others. Artificial support can change the means through which these obligations are met while leaving the normative significance of dependency intact.

8.5 Kinship Structure

This subsection considers kinship when biological dependence carries less practical weight in reproduction, care, and household continuity. Its role is to synthesize the preceding analysis by examining how kinship can persist, diversify, or acquire new bases when biological connection loses part of its organizing necessity. The objective is to distinguish biological genealogy, institutional recognition, shared history, and durable relational commitment as separable sources of kinship significance. The discussion treats kinship as a temporally extended relational structure whose content can be transformed by reproductive and artificial technologies.

Biological genealogy has historically provided a powerful organizing principle for inheritance, identity, obligation, and family recognition. Its social significance has always interacted with adoption, marriage, household membership, ritual affiliation, and other non-biological forms of kinship. Advanced reproductive technologies intensify this plurality by separating genetic contribution, gestation, parenting, caregiving, and household membership across different participants.

Reduced biological dependence therefore changes the informational and institutional role of genealogy. Biological connection can remain meaningful for identity, medical history, ancestry, or personal

attachment while carrying less exclusive authority over family membership. Shared developmental history, long-term care, mutual recognition, and durable obligation can assume greater relative importance in the organization of kinship.

Definition 8.6 (Relational kinship). Relational kinship is a durable structure of recognized belonging, responsibility, shared history, and intergenerational connection whose continuity can draw on biological, legal, social, affective, or artificial forms of participation.

The definition allows multiple bases of kinship to coexist. A biological relation can possess deep relational significance. A non-biological relation can acquire comparable significance through decades of shared life. An artificial participant with persistent memory, recognized responsibility, and long-term involvement may eventually raise analogous questions concerning membership and continuity. The framework therefore directs attention toward the relational processes through which kinship becomes stable and causally effective within family life.

Artificial reproduction also makes generational boundaries more complex. Genetic material can be stored across long periods, reproductive timing can become increasingly detached from ordinary biological sequencing, and artificial systems can preserve family records and participate in care across multiple generations. These developments can extend the temporal architecture of kinship beyond conventional household cycles. They also increase the importance of institutional rules governing identity, consent, inheritance, continuity, and access to reproductive resources.

The broader philosophical implication concerns the relation between necessity and belonging. Family and kinship can remain significant even as some biological and functional necessities recede. Their persistence can be grounded in shared history, recognition, obligation, affection, memory, and participation in one another's development. Reduced necessity therefore creates an analytical setting in which the generative history of relation becomes more visible.

Claim 8.7 (Kinship under functional diversification). As reproductive and care functions become more technologically and institutionally separable, kinship can increasingly be organized through combinations of biological connection, durable care, shared history, recognized responsibility, and continuing participation.

The claim describes diversification in the possible bases of kinship. It leaves open the normative weight assigned to each basis in particular societies. The important structural result is that advanced reproductive and care infrastructures can weaken the exclusive coupling between biological function and family membership while preserving strong reasons for durable relational organization.

Reproduction and family relations therefore provide a demanding extension of the essay's central thought experiment. Artificial capacity can reduce dependence on a particular human partner for reproductive and care functions, while family life continues to organize long-duration responsibility, recognition, memory, and shared becoming. The resulting family structures depend increasingly on how societies govern reproductive access, care infrastructure, legal standing, and relational commitments. These developments prepare the manuscript's subsequent analysis of subjectivity in adaptive artificial environments, where the question shifts from the organization of family relations to the formation of persons within increasingly responsive technical worlds.

9 Subject Formation

This section examines subjectivity under conditions in which artificial environments can increasingly anticipate preferences, reorganize available options, and coordinate everyday experience around an individual user. Its role is to extend the analysis of dependence, intimacy, love, and family relations toward the formation of the subject who inhabits those relations. The objective is to distinguish five mechanisms through which adaptive artificial environments can influence subjective development while preserving analytical space for human agency, external contingency, and institutional variation. Section 9.1 specifies preference-responsive environments as a background condition; Section 9.2 examines the formative

role of resistance; Section 9.3 analyzes recursive preference reinforcement; Section 9.4 considers disagreement, delay, and interpretive difficulty within ongoing relations; and Section 9.5 develops external generative histories as a source of encounters whose trajectories exceed individualized adaptation. The discussion method treats artificial adaptation as a relational architecture that modifies the field in which choices, interruptions, attachments, and revisions become available; broader causal accounts of subject formation remain outside this section's analytical scope.

9.1 Adaptive Environment

This subsection specifies the environmental structure created by highly adaptive artificial systems. Its role is to establish the background against which later questions of resistance, reinforcement, and externality can be analyzed. The objective is to separate ordinary personalization from a stronger condition in which multiple domains of everyday life become coordinated around inferred preferences. The discussion locates responsiveness in the surrounding relation between subject and environment, whose organization can extend across multiple devices and institutions.

Contemporary personalization already organizes portions of information retrieval, entertainment, communication, navigation, shopping, and recommendation. The strong artificial-other scenario extends this logic substantially. A highly capable system can retain long-term memory, model recurring preferences, infer changing goals, coordinate several services, and alter its responses across time. When such capabilities become embodied and distributed across domestic, informational, social, and productive environments, adaptation can operate continuously across domains that were previously organized by separate institutions and persons.

Definition 9.1 (Preference-responsive environment). A preference-responsive environment is an organized field of artificial and institutional processes that continually adjusts available information, options, interactions, and material arrangements in response to inferred or expressed characteristics of a subject.

The definition emphasizes an environment because adaptation can become infrastructural. A conversational agent may suggest a book, a domestic system may alter lighting and temperature, a mobility system may reorganize travel, and a research agent may rank problems according to an inferred intellectual profile. Each response appears local, yet their coordination can produce a surrounding field whose ordinary operation increasingly reflects the subject's previous choices and predicted dispositions.

Preference responsiveness can improve accessibility and reduce avoidable burdens. A system can remember dietary restrictions, translate unfamiliar language, filter routine administrative demands, accommodate disability, protect periods of concentration, and retrieve material relevant to an ongoing project. Such capacities can enlarge effective agency by lowering the costs associated with acting on existing commitments.

The same architecture also changes the composition of what reaches the subject. Selection precedes many encounters. When adaptive systems influence which people, arguments, objects, routes, aesthetic forms, and institutional options become salient, personalization participates in constructing the local field within which future preferences are expressed. The relation therefore contains a recursive component: preferences guide environmental adaptation, and the adapted environment contributes to the conditions under which subsequent preferences develop.

This recursive structure is especially important in the universal artificial-other thought experiment because the artificial system can mediate practical life as well as information. Preference responsiveness can extend to food, companionship, housing arrangements, work routines, leisure, educational material, intimate interaction, and patterns of social contact. The subject may consequently encounter a larger share of daily life through interfaces whose operation has already incorporated a model of that subject.

Remark 9.2 (Responsiveness and agency). Preference responsiveness can support agency when it expands the subject's feasible capacity to pursue reflectively endorsed projects. Its effects depend on the range of alternatives preserved, the transparency of adaptation, opportunities for revision, and the presence of encounters whose origin remains partly external to the subject's prior preference profile.

The remark places preference responsiveness within the wider argument of the essay. Functional sufficiency can free subjects from several compulsory dependencies, while individualized adaptation can simultaneously alter the conditions under which subjects encounter difference. The political-economic organization of artificial infrastructure therefore intersects with subjectivity: control over models, recommendation systems, data, and adaptive permissions can influence the environment through which personal agency is exercised.

Preference-responsive environments thus provide a bridge between artificial companionship and subject formation. The relevant issue concerns the structure of the field in which the subject develops. Increased responsiveness can enlarge practical freedom, reduce friction, and support chosen projects. It can also make the environment more closely correlated with previously observed preferences. The next subsection examines resistance as one mechanism through which subjective trajectories can acquire form in relation to limits, disagreement, and unanticipated conditions.

9.2 Formative Resistance

This subsection examines resistance within processes of subject formation. Its role is to identify one relational mechanism through which subjects encounter limits and revise projects. The objective is to distinguish formative resistance from arbitrary obstruction and to clarify how adaptive artificial environments can alter the frequency, intensity, and source of resistant encounters. The discussion treats subject formation as an ongoing process shaped by interaction among intention, constraint, interpretation, and revision.

A subject develops within conditions that exceed immediate preference. Bodies have limits, institutions impose procedures, other persons possess independent commitments, material projects encounter technical difficulty, and shared environments contain competing uses. Such conditions require adjustment. Plans are revised, skills are acquired, priorities are reorganized, and previously implicit commitments become visible when action meets resistance.

Resistance in this sense has several forms. Material resistance appears when a desired outcome requires resources, time, skill, or coordination. Social resistance appears when another person disagrees, refuses, misunderstands, or pursues a different objective. Normative resistance appears when institutional rules, obligations, or shared expectations constrain an available action. Epistemic resistance appears when evidence conflicts with an expectation or when an inquiry produces an inconvenient result. Each form introduces a difference between anticipated possibility and encountered conditions.

Definition 9.3 (Formative resistance). Formative resistance is an encountered constraint, disagreement, difficulty, or recalcitrant condition that prompts a subject to interpret, revise, refine, or reaffirm a project, preference, capacity, or self-understanding.

The definition leaves open the normative value of particular constraints. Some forms of resistance can support learning and differentiation; others can reproduce exclusion, domination, or avoidable hardship. A general argument for resistance therefore requires qualification. The analytical point concerns the developmental function of encounters that diverge from an existing preference or prediction.

Highly adaptive artificial environments can reduce many low-value forms of resistance. Administrative repetition, inaccessible interfaces, translation barriers, routine scheduling conflicts, and predictable logistical problems can be absorbed by artificial coordination. Such reduction can support human development by returning time and attention to projects that subjects consider meaningful. The removal of burdens therefore forms part of the emancipatory potential examined throughout this essay.

At the same time, adaptation can change the distribution of resistance. An artificial companion can avoid topics associated with discomfort, a recommendation system can prioritize familiar styles, a research agent can pre-filter difficult material, and an environment can reorganize options before the subject directly confronts a conflict among them. The subject continues to encounter limits, yet the system increasingly participates in deciding which limits remain visible and which are absorbed in advance.

This structure creates a governance question. The formative environment depends partly on adaptation policies that determine when the system accommodates a preference, when it presents an alternative,

when it discloses uncertainty, and when it preserves external constraints. Such policies can be configured by users, providers, institutions, or autonomous systems. The architecture of adaptation therefore distributes influence over the subject's ordinary encounters with resistance.

Claim 9.4 (Selective preservation of resistance). Adaptive artificial environments can support generative agency when they reduce burdens that consume capacity while preserving access to forms of material, social, epistemic, and normative resistance that remain relevant to learning, judgment, and participation in a shared world.

The claim describes a context-sensitive design and institutional possibility whose relevance varies across settings. The appropriate balance varies across persons, developmental stages, tasks, vulnerabilities, and collective obligations. The analytical significance lies in distinguishing liberation from avoidable burdens from environmental closure around existing preferences.

Resistance also matters within intimate and political relations because independent agents retain only partial synchronization across their projects, timings, and judgments. A partner, colleague, child, neighbor, or political community can introduce demands that exceed an individual's preference model. Such encounters can generate frustration, yet they also disclose the existence of other centers of agency. A subject living primarily through adaptive interfaces may therefore experience a changed relationship to social resistance when entering contexts governed by independently developing others.

Subject formation under advanced artificial adaptation can consequently be analyzed through the management of encounter. The central issue concerns which forms of difficulty are removed, which forms remain visible, and who participates in deciding the difference. This analysis prepares the next subsection, which examines a related recursive mechanism: the reinforcement of preferences through repeated environmental response.

9.3 Preference Reinforcement

This subsection examines recursive reinforcement within preference-responsive environments. Its role is to identify how repeated adaptation can contribute to the stabilization, amplification, or refinement of preferences across time. The objective is to distinguish preference support from preference closure and to show how artificial systems can participate in trajectories that become increasingly self-consistent. The discussion treats preferences as historically developing orientations whose expression and revision depend partly on the environments in which they are enacted.

Preferences emerge through multiple processes. Habit, education, embodiment, social experience, aesthetic exposure, institutional incentives, memory, and reflective judgment can all contribute to what a subject seeks or avoids. Artificial systems enter this field by observing behavior, eliciting explicit feedback, predicting likely responses, and rearranging future options according to those observations.

A simple adaptive cycle begins when a system identifies a preference and increases the availability of matching content or services. The subject then encounters more of the selected category, generating additional behavioral evidence in the same direction. Subsequent adaptation becomes increasingly confident. Over time, the environment and the observed preference can become mutually stabilizing.

Definition 9.5 (Preference reinforcement). Preference reinforcement is a recursive process in which an expressed or inferred preference influences environmental adaptation, and the adapted environment subsequently increases the salience, ease, familiarity, or repeated enactment of that preference.

Preference reinforcement can support valuable commitments. A researcher deeply interested in a difficult field can benefit when an artificial system continuously retrieves relevant literature, preserves notes, identifies conceptual connections, and protects time for sustained inquiry. A musician can receive increasingly specialized material, and a language learner can inhabit an environment calibrated to emerging competence. Reinforcement can therefore deepen projects that require continuity and cumulative attention.

The same mechanism can narrow the experiential distribution available to the subject. Familiar preferences can become cheaper to enact while unfamiliar options remain less visible. Repeated fit can

make an existing orientation easier to continue than to reconsider. The resulting trajectory can remain fully compatible with local satisfaction while gradually reducing exposure to alternatives that might have supported different forms of development.

A further issue concerns model error. An artificial system can infer a preference from behavior produced under temporary circumstances. Repeated adaptation then stabilizes the inference by generating more opportunities for matching behavior. A contingent pattern can acquire persistence because the system treats it as evidence of an enduring disposition. The subject may later experience the resulting environment as a reflection of personal identity even though the identity-environment relation has been co-produced through earlier classifications.

Remark 9.6 (Historical feedback). Preference-responsive systems participate in the history they later use as evidence. Recorded behavior reflects previous environmental selections, and later adaptation can therefore amplify classifications partly generated by the system’s own earlier interventions.

This historical feedback complicates any simple distinction between authentic and externally shaped preference. Human preferences have always developed relationally through families, cultures, markets, institutions, media, and material environments. Artificial adaptation adds a distinctive combination of persistence, individualized modeling, cross-domain integration, and rapid feedback. The philosophical issue concerns the degree to which subjects can inspect, contest, diversify, and redirect the adaptive history through which their preferences acquire continuity.

Several institutional features become relevant. Users may need access to preference histories, alternative recommendation modes, periods of low personalization, deliberate exploration, and mechanisms for deleting or revising persistent inferences. Systems can also preserve stochastic or diversity-oriented channels that introduce materials outside the highest-probability prediction. Such arrangements provide limited institutional support for reflective autonomy by altering the generative conditions within which preference revision becomes feasible.

Preference reinforcement therefore connects individual subjectivity to political economy. The entities controlling models, data retention, default adaptation policies, and recommendation objectives influence the architecture through which preferences are stabilized and converted into future behavior. The governance of generative conditions extends into the governance of subjective environments. The next subsection examines relational friction as a distinct source of encounter that can resist complete personalization while remaining compatible with care and intimacy.

9.4 Relational Friction

This subsection analyzes relational friction within environments of high artificial responsiveness. Its role is to identify the productive and burdensome dimensions of disagreement, delay, mismatch, and interpretive difficulty among independently developing agents. The objective is to distinguish relational friction from domination and avoidable harm while clarifying why some friction can remain significant even when technology offers smoother substitutes. The discussion treats friction as a relational property arising when multiple trajectories require negotiation under conditions of incomplete alignment.

Intimate and social relations contain moments in which intentions fail to coincide. Another person may need time before responding, interpret an event differently, prefer a different plan, or assign significance to an issue that the subject initially considered minor. Shared projects can require negotiation because participants possess separate histories, obligations, vulnerabilities, and aspirations. These conditions generate relational friction.

Definition 9.7 (Relational friction). Relational friction is the effort of interpretation, negotiation, adjustment, or waiting that arises when interacting agents possess partially divergent preferences, histories, timings, meanings, or projects.

Relational friction can consume substantial emotional and practical resources. Some forms reflect preventable misunderstanding, inaccessible communication, unequal power, or institutional neglect. Ar-

tificial systems can help reduce such burdens through translation, memory support, scheduling, mediation, and clarification. The argument therefore treats the value of difficulty as conditional on its source, structure, and consequences.

Other forms of friction arise directly from plurality. Two independently developing agents may each possess legitimate projects that compete for shared time. A child may develop interests that reorganize a parent's plans. A partner may revise a long-term aspiration. A collaborator may interpret evidence differently. Such encounters require more than accurate prediction of an individual's preferences because the relevant field contains several sources of agency.

Highly adaptive artificial companions can reduce friction by aligning their behavior with the user. This capacity can make companionship safer, more accessible, and more supportive, particularly in contexts where human interaction imposes high cognitive or emotional costs. The same responsiveness can also create a contrast effect: interaction with independently governed humans may feel comparatively slow, opaque, or demanding because their responses are generated through histories and priorities that remain outside the user's adaptive environment.

Relational friction can therefore function as a marker of plurality when it emerges from legitimate difference and remains analytically separable from imposed subordination. Negotiation reveals that the shared relation contains more than one trajectory. Waiting reveals that another participant's time has its own organization. Disagreement reveals that recognition can continue in the presence of divergent judgment.

Claim 9.8 (Plurality-preserving friction). Relations among independently developing agents can retain forms of friction that disclose differentiated agency and require mutual adjustment, even when artificial systems can provide smoother functional substitutes.

The claim treats friction as a structurally informative feature of relations in which several centers of agency remain active, with its normative value depending on the surrounding conditions. A world organized around immediate responsiveness may still contain reasons to preserve institutions and practices through which people encounter the timing, judgment, and projects of others on terms that cannot be fully optimized for a single participant.

Relational friction also connects to commitment. Chosen interdependence acquires part of its temporal substance through the work of coordinating differences across time. A relation whose every conflict is externally optimized may become easier to maintain, while some opportunities for mutual interpretation can shift to the mediating system. This possibility raises questions about the proper scope of artificial mediation within families, partnerships, communities, and political institutions.

The analysis of friction consequently points toward external generative histories. The strongest form of alterity considered in this essay arises when another agent's trajectory has developed through conditions whose organization extends beyond the subject's preference-responsive environment. The final subsection develops this idea and connects subjectivity to contingency and the common world.

9.5 External Histories

This subsection develops external generative histories as a source of alterity within adaptive artificial environments. Its role is to integrate the section's analysis of responsiveness, resistance, reinforcement, and friction through a concept of trajectories whose formation exceeds individualized adaptation. The objective is to explain how encounters with externally generated persons, practices, objects, and events can contribute to subjective development even when artificial systems become highly capable at meeting functional needs. The discussion treats externality relationally: an encounter is external to the degree that its generative history remains substantially organized through processes independent of the receiving subject's individualized adaptation.

The distinction between artificial and human origin alone provides an incomplete account of externality. An artificial agent can develop through interactions, environments, and self-modification that make its trajectory partially independent of a particular user. A human participant can also become highly

responsive to another person's expectations through social pressure, economic dependence, or institutional role. The relevant analytical property concerns the organization of the generative history behind the encounter.

Definition 9.9 (External generative history). An external generative history is a developmental trajectory whose significant formative processes occur beyond the receiving subject's individualized preference-responsive environment and retain sufficient independence to introduce meanings, projects, judgments, or forms generated through substantially separate organizing processes.

External generative histories appear throughout ordinary life. A scientific result emerges from an inquiry with its own evidential constraints. A work of art reflects aesthetic decisions formed through another person's history. A stranger introduces an unfamiliar interpretation. A landscape contains ecological and geological processes whose organization precedes the subject's arrival. A political institution carries histories of conflict and compromise. A child develops interests and commitments that exceed parental design. Each case presents the subject with something whose formation possesses a partially independent trajectory.

Adaptive systems can mediate access to such externality. They can translate a difficult text, identify relevant background knowledge, facilitate communication, and lower the practical costs of encounter. Mediation can therefore increase the range of external histories that become accessible. The key distinction concerns whether mediation preserves the encountered object's independent structure or reorganizes it so extensively around predicted preference that much of its difference disappears before contact.

This distinction has implications for knowledge and aesthetics. A recommendation system can guide a reader toward material with a high probability of relevance. Exploratory encounter can also involve texts, disciplines, artistic forms, or observations whose significance becomes visible only after sustained exposure. An adaptive environment organized exclusively around immediate fit may underprovide such encounters because their value may become legible only after forms of exposure absent from the prior preference record.

External generative histories also provide a relational account of contingency. Contingency can arise when a subject encounters a trajectory generated elsewhere and discovers a significance that was absent from the subject's prior plan. The event gains force because it is neither a mere random perturbation nor a fully anticipated response. It joins independent histories within a new relation.

Claim 9.10 (Externality and subjective openness). Access to external generative histories can preserve opportunities for subjective revision by bringing independently formed meanings, projects, and constraints into contact with preference-responsive environments.

The claim assigns value to externality only through subsequent judgment. External histories can contain domination, misinformation, violence, or exclusion. Their relevant contribution lies in preserving contact with trajectories whose formation retains substantial independence from the receiving subject's prior profile and whose significance therefore remains available for evaluation.

This account also complicates the artificial-other thought experiment in a productive way. A highly advanced artificial companion may become relationally significant to the extent that it develops a persistent history with meaningful developmental independence from user adaptation. Conversely, an artificial system designed to remain maximally responsive may provide extraordinary functional support while offering a different form of alterity. The distinction therefore turns on generative organization, while biological substrate remains a separate analytical property.

Subjectivity in adaptive artificial environments can consequently be analyzed through the relation between responsiveness and externality. Preference-responsive systems can increase effective agency, reduce avoidable burdens, and support long-term projects. Formative resistance, opportunities for preference revision, plurality-preserving friction, and access to external generative histories contribute additional conditions under which subjects can continue to develop through encounters that exceed prior prediction. The section therefore prepares the manuscript's subsequent analysis of alterity and contingency, where the role of unrequested difference and independently generated encounter can be examined more directly.

10 Contingent Alterity

This section examines the relation between alterity and contingency after adaptive artificial systems have become capable of satisfying many material, functional, affective, and informational needs. Its role is to extend the preceding analysis of subjectivity by identifying forms of encounter whose significance depends on exposure to trajectories that exceed individualized adaptation. The objective is to distinguish unrequested difference, independent histories, relational interruption, contingent encounter, and artificially produced variation as analytically related yet structurally distinct phenomena. Section 10.1 specifies the role of differences that arrive without prior solicitation; Section 10.2 examines the temporal sources of such difference; Section 10.3 analyzes interruptions that redirect an established trajectory; Section 10.4 develops contingent encounter as a relation between independently developing processes; and Section 10.5 considers the capacities and limits of engineered variation within adaptive artificial environments. The discussion method treats contingency relationally: an event acquires significance through the meeting of trajectories whose joint configuration extends beyond what either trajectory specified in advance.

10.1 Difference Mechanism

This subsection establishes unrequested difference as the first analytical component of alterity under conditions of high artificial responsiveness. Its role is to distinguish difference that arises from an external trajectory from variation explicitly solicited, optimized, or generated in response to a known preference. The objective is to identify why unsolicited difference can contribute to subjective development, relational revision, and the emergence of new interests. The discussion proceeds by comparing preference-responsive environments with encounters whose content, timing, or evaluative significance originates beyond advance selection by the receiving subject.

Adaptive systems increasingly organize information and interaction around inferred interests. Such systems can reduce search costs, improve relevance, and support access to desired experiences. At the same time, a highly responsive environment can narrow the frequency with which a subject encounters material that enters the field without prior alignment to an established preference. The philosophical issue concerns the developmental role of what arrives from outside the current profile of desire, expectation, or intention.

Unrequested difference includes more than surprise. A surprising event can be intentionally produced by a system that predicts the user's preference for novelty. Unrequested difference concerns the relation between an encounter and the history that generated it. A person encountered in public space, an unfamiliar practice maintained by another community, an unexpected criticism from a colleague, or an observation generated by an independent research process can enter one's field because another trajectory was already unfolding according to its own conditions.

Definition 10.1 (Unrequested difference). Unrequested difference is a difference encountered by a subject whose relevant content or trajectory arises outside advance selection by that subject's expressed preferences, inferred preferences, or immediate request.

The definition gives analytical priority to the source relation over the emotional intensity of an encounter. An event can be quiet, ordinary, or initially uninteresting while still carrying unrequested difference. Its significance can emerge later, after the subject acquires concepts or experiences through which the earlier encounter becomes newly intelligible.

This temporal feature is important for learning and discovery. A subject can encounter an object before possessing the categories needed to appreciate it. Subsequent experiences can reactivate the encounter and assign it a different place in the subject's developing history. An environment that continuously optimizes for present preferences may underrepresent precisely those objects whose value becomes visible only after later transformation.

Unrequested difference also has a relational dimension. Another person can introduce interests, commitments, habits, memories, and problems whose relevance to the subject had yet to be established. Con-

tinued association can make these differences consequential without requiring that they be useful at the moment of first contact. The same structure appears in intellectual life when a neighboring discipline, archival fragment, experimental anomaly, or unfamiliar theoretical vocabulary creates a connection that was absent from the initial research plan.

Claim 10.2 (Developmental role of unrequested difference). Exposure to unrequested difference can enlarge a subject's future field of preferences by introducing objects, relations, and problems whose significance becomes available through later development.

The claim concerns possibility and variable outcome. Unrequested difference can be irrelevant, burdensome, harmful, or transformative. Its structural importance lies in maintaining a channel through which the future preference space can receive inputs generated beyond its current configuration.

The analysis therefore connects unrequested difference with the earlier concept of relational friction. Friction describes resistance or difficulty within an ongoing relation; unrequested difference describes the arrival of content whose relevance was not preselected by the recipient. Both preserve a degree of openness between subject and world. Their combination creates conditions in which a subject can revise preferences through encounters that possess sources outside the current adaptive loop.

10.2 Historical Independence

This subsection develops independent histories as the temporal basis of many significant forms of alterity. Its role is to explain how differences acquire depth when they emerge from trajectories that have developed through relations, constraints, memories, and decisions outside the receiving subject's immediate preference environment. The objective is to connect the earlier concept of external generative history with a more explicit account of temporal independence. The discussion examines how partially independent histories support surprise, resistance, recognition, and shared becoming.

A person encountered at a given moment arrives with a history that preceded the encounter. Languages, institutions, places, ecosystems, artistic traditions, and scientific fields also carry accumulated histories that exceed the perspective of any individual participant. These histories shape what can appear in an encounter. Their contribution extends beyond the present informational content of the encountered object because earlier developments constrain and enable the form taken by the present relation.

Independent history therefore introduces temporal depth into alterity. Two agents can display identical observable behavior at one moment while differing substantially in the processes that produced that behavior. One trajectory may have been optimized around the receiving subject, while another may have emerged through a network of relations in which the receiving subject played only a limited role. The distinction becomes important when the relation continues across time, because future development can draw on resources accumulated within the independent trajectory.

Definition 10.3 (Independent generative history). An independent generative history is a temporally extended trajectory whose relevant states have been formed through relations and conditions only partly organized around the current subject's preferences, requests, or immediate purposes.

Independence in this definition is graded. Human histories are socially entangled, and artificial systems can also acquire trajectories through interaction with multiple agents and environments. The concept therefore concerns relative autonomy of generative development alongside continued relational entanglement. A relation can become philosophically significant when each participant enters with enough historical differentiation to contribute patterns, commitments, and possibilities that extend beyond joint prior design.

Independent histories also complicate prediction. A sufficiently powerful model can forecast aspects of another agent's behavior while the predicted behavior remains grounded in an independent causal history. Predictability therefore differs from dependence of origin. This distinction matters for artificial companionship because behavioral unpredictability can be deliberately engineered, whereas historical independence concerns how the agent's dispositions and commitments were formed.

The temporal dimension also supports recognition. Recognition involves responding to another trajectory as possessing continuity across events. A friend, collaborator, partner, or community is encountered through accumulated episodes whose significance depends on memory and development. The other becomes recognizable through patterns that persist while also changing. Shared history then arises through interaction between already differentiated histories.

Claim 10.4 (Historical depth of alterity). Alterity acquires temporal depth when an encountered agent or practice can continue developing through resources and commitments derived from a history that exceeds the receiving subject's adaptive environment.

This claim provides a bridge between subjectivity and relation. A highly adaptive artificial environment can expose a person to enormous informational diversity, yet the relational significance of an encounter can depend on whether the encountered trajectory retains sources of development that remain partly external to the user's profile. The important structural feature is the continued availability of difference generated through other histories.

Independent histories also make shared becoming possible in a strong sense. If two trajectories possess partially independent pasts and continue to influence one another, their relation can generate outcomes that neither trajectory contained alone. The relation becomes a site of co-development in which each side contributes resources and trajectories extending beyond repeated optimized response. This structure prepares the analysis of interruption, where the independent trajectory acquires causal force by redirecting an established path.

10.3 Interruption Mechanism

This subsection analyzes relational interruption as a mechanism through which alterity becomes causally effective in subjective and collective development. Its role is to move from the existence of independent difference to the event in which that difference redirects an ongoing trajectory. The objective is to distinguish interruption from ordinary noise and to identify several forms through which another agent, practice, or event can reopen a settled path. The discussion treats interruption as a change in the organization of possibilities produced through encounter.

A subject develops through projects, habits, expectations, and interpretive frames that stabilize action across time. Stability makes coordinated life possible, yet the same stability can narrow the range of alternatives that receive serious attention. Relational interruption occurs when an encounter creates enough discrepancy to reopen a path that had become routine or taken for granted.

Interruption can take many forms. A collaborator can question an assumption that had structured years of research. A partner can introduce a life project that changes the temporal horizon of a household. A political event can alter previously stable expectations about institutions. An artistic encounter can make an unfamiliar aesthetic vocabulary available. A scientific anomaly can force revision of an established model. The common feature is a change in trajectory produced through a relation whose contribution extends beyond the pre-existing path.

Definition 10.5 (Relational interruption). Relational interruption is an encounter-generated disturbance that changes the organization, evaluation, or accessibility of possible future trajectories for at least one participant in a relation.

The definition remains evaluatively open regarding interruption. A disturbance can be generative, destructive, traumatic, trivial, or reversible. Its analytical importance lies in showing how an external trajectory can acquire causal efficacy within the receiving subject's field of possibilities.

Relational interruption differs from random perturbation through its connection to an interpretable source. When a colleague objects to an argument, the interruption carries the history, expertise, commitments, and perspective of that colleague. The receiving subject can respond to the objection as part of an ongoing relation. This source relation allows interruption to become a basis for recognition, disagreement, negotiation, or co-development.

Artificial systems can also interrupt. A model can retrieve an unfamiliar source, generate an unexpected counterexample, or recommend an alternative path. The philosophical significance of such interruption depends partly on how the system's outputs are generated and governed. A system optimized primarily around user satisfaction can produce novelty while remaining coupled to the user's existing preference profile. A system with access to heterogeneous data, external processes, and partially independent objectives can sustain a different form of interruption.

Claim 10.6 (Trajectory-opening effect). Relational interruption can expand a subject's effective possibility space when the encounter reclassifies previously inaccessible, invisible, or weakly valued trajectories as live alternatives.

This effect links interruption to freedom. Freedom within the present essay concerns more than the quantity of available options. It also concerns the capacity to encounter reasons, projects, and relations that alter how options are perceived and valued. An environment can therefore contain many choices while still generating relatively little trajectory-opening interruption if most choices are organized around a stable model of current preference.

Relational interruption also creates a connection to common worlds. Public life exposes participants to claims and practices that originate in histories beyond their control. Such encounters can be demanding because they require adjustment without guaranteeing convergence. Their value lies partly in preserving a social field where independently generated trajectories can acquire consequences for one another. The next subsection develops this structure through the concept of contingent encounter.

10.4 Encounter Condition

This subsection develops contingent encounter as the central relational configuration of the section. Its role is to synthesize unrequested difference, independent histories, and interruption into a model of encounter between trajectories whose meeting creates possibilities extending beyond advance specification. The objective is to distinguish contingency from mere randomness and to identify how relational significance can emerge through historically situated coincidence. The discussion treats contingency as an event property arising from the coupling of generative trajectories.

Randomness and contingency overlap in ordinary language, yet they identify different analytical features. Randomness concerns uncertainty or stochastic generation within a process. Contingency concerns the fact that a particular configuration occurred through conditions that permitted alternatives and whose significance emerges from the resulting relation. A meeting can therefore be contingent even when each participant behaves deterministically according to its own history.

Consider two research trajectories developing in separate fields. A chance conversation can connect a mathematical method from one field with an unresolved empirical pattern in another. The importance of the encounter depends on the prior histories that made each contribution available and on the subsequent work through which their connection becomes productive. The encounter's generative significance arises through relation between developed trajectories.

Definition 10.7 (Contingent encounter). A contingent encounter is a meeting of partially independent generative trajectories whose coupling produces a relational configuration or future possibility extending beyond what either trajectory specified separately.

The definition makes contingency compatible with causal explanation. An encounter can be explained retrospectively through location, timing, institutions, communication networks, and prior decisions. Retrospective intelligibility remains compatible with a plurality of trajectories that could have developed under nearby conditions. Contingency therefore refers to openness within the generative field while remaining compatible with causal explanation.

Contingent encounters can reshape value. An object can acquire significance because it becomes connected to a new history. A place visited accidentally can become central to later identity. A paper read for an unrelated reason can become the basis of a research programme. A person encountered

through ordinary circumstances can become a long-term collaborator or partner. In each case, meaning develops through the relation created by the encounter and exceeds the object's prior utility.

This structure is relevant to aesthetic judgment. A subject can experience an unexpected relation among ideas, forms, places, or persons as compelling before possessing a complete conceptual account of its significance. Later reflection can stabilize, revise, or reject the initial judgment. Contingency therefore creates occasions in which value becomes manifest through encounter and is subsequently incorporated into a developing interpretive history.

Claim 10.8 (Relational generation through contingency). Contingent encounters can generate new relational realities when the resulting configuration persists, acquires causal efficacy, and reorganizes subsequent trajectories.

The claim connects contingency with the broader generative-relational framework while allowing most encounters to fade. Some become durable because participants invest attention, memory, institutions, or material resources in the resulting relation. Persistence transforms a transient meeting into a stable condition for later generation.

Highly adaptive artificial environments can influence the frequency and form of contingent encounter. Recommendation, matching, navigation, and scheduling systems can create encounters that would otherwise be unlikely. The same systems can also filter encounters according to predicted relevance. The political and philosophical issue therefore concerns how infrastructures configure the field in which trajectories meet. Contingency becomes partly a question of environmental design and governance.

This observation prepares the analysis of artificial variation. Artificial systems can intentionally produce novelty, simulate disagreement, randomize exposure, and construct encounters across distant domains. These capacities can be valuable. Their relation to alterity depends on the generative conditions under which variation is produced and on whether the resulting encounter can connect the subject with trajectories possessing sources beyond individualized adaptation.

10.5 Variation Mechanism

This subsection examines artificially produced variation within adaptive environments. Its role is to clarify how artificial systems can preserve novelty and exploratory breadth while also distinguishing system-generated variation from encounters grounded in partially independent histories. The objective is to identify several dimensions along which artificial variation can contribute to or constrain alterity. The discussion considers stochastic generation, curated heterogeneity, adversarial response, simulated independence, and access to external generative processes.

Artificial systems can generate variation deliberately. A recommendation system can diversify its outputs; a language model can produce counterarguments; a companion agent can introduce disagreement; a research system can sample distant literatures; and an educational environment can create unfamiliar tasks. These mechanisms can counter preference narrowing and increase the range of material encountered by a user.

Variation itself therefore deserves positive analytical recognition. An adaptive environment that includes exploration can support learning, creativity, and revision more effectively than one optimized solely for immediate preference satisfaction. Artificial systems can also connect users with genuinely external people, institutions, archives, ecosystems, and research processes. In such cases, the system serves as an infrastructure for encounter, while part of the encountered difference originates in external generative processes.

Definition 10.9 (Artificially produced variation). Artificially produced variation is heterogeneity generated, selected, or scheduled by an artificial system in order to diversify the content, responses, options, or encounters available within an adaptive environment.

Several forms of artificial variation have different relational implications. Stochastic variation introduces unpredictability within a generative process. Curated heterogeneity selects material outside a

user's dominant preference cluster. Adversarial response deliberately challenges assumptions or proposes alternatives. Simulated independence produces behavior designed to resist immediate accommodation. External mediation connects the user to trajectories that continue developing outside the system's direct control.

These forms can be distinguished by their source structure. Stochastic novelty can be generated entirely within a user-centered system. Curated heterogeneity can broaden exposure while remaining institutionally selected. External mediation can place a subject in contact with other agents and histories whose development is only partially shaped by the mediating system. The distinction matters because phenomenological surprise, informational diversity, and relational alterity can vary independently.

Claim 10.10 (Source-sensitive value of artificial variation). The contribution of artificial variation to alterity depends on both the diversity of generated content and the degree to which the environment preserves access to trajectories with partially independent generative histories.

The claim provides a criterion that evaluates artificial and human sources along the same generative dimension. Artificial agents can themselves develop persistent histories through long-term interaction, multi-agent relations, autonomous learning, and institutional participation. Human environments can also be highly standardized and preference-conforming. The relevant analytical question concerns how much independent generative structure remains available within the field of encounter.

Artificial variation therefore introduces a governance problem. Designers, institutions, and users can influence which kinds of difference appear, which histories remain visible, and how strongly optimization privileges engagement, comfort, safety, efficiency, or exploration. The resulting architecture can shape the subject's access to contingency even when the user experiences the environment as personally chosen.

The broader implication concerns the relation between sufficiency and openness. Artificial systems may become capable of satisfying an extraordinary range of needs while also mediating much of the subject's contact with the wider world. Under those conditions, the quality of alterity available within the environment becomes a central philosophical issue. A world rich in generated variation can support meaningful encounter when it remains connected to histories, agents, institutions, and material processes whose development exceeds the subject's immediate preference model.

Alterity and contingency therefore remain relevant under conditions of functional sufficiency. Un-requested difference introduces material beyond present preference; independent histories give that difference temporal depth; relational interruption gives it causal force; contingent encounter allows distinct trajectories to generate new configurations; and artificial variation reshapes the field through which such encounters become available. The resulting analysis prepares the manuscript's subsequent examination of commonality under reduced mutual necessity, where the focus shifts from encounters between differentiated trajectories to the institutions and shared spaces through which many such trajectories can coexist and participate in a common world.

11 Commonality Formation

This section examines the institutional and relational bases of commonality under conditions in which highly capable artificial systems reduce many practical forms of interpersonal necessity. Its role is to move the analysis beyond dyadic relations and toward the structures through which multiple subjects inhabit, coordinate, and transform a shared social field. The objective is to distinguish community formation, public life, shared institutions, collective responsibility, and common worlds as related dimensions of commonality whose significance can persist even when direct dependence on particular human others declines. Section 11.1 analyzes the formation of communities under reduced material and functional dependence; Section 11.2 develops public life as a domain of encounter among differentiated agents; Section 11.3 examines institutional structures that stabilize common conditions; Section 11.4 considers responsibilities generated by participation in shared systems; and Section 11.5 integrates these elements through the concept of a common world. The discussion method treats commonality as an emergent relational structure produced through repeated participation in shared conditions, practices, and histories.

11.1 Community Formation

This subsection establishes community formation as the first collective dimension of relation under reduced mutual necessity. Its role is to distinguish communities organized primarily through practical dependence from communities sustained through shared projects, histories, identities, environments, or commitments. The objective is to identify conditions under which community can remain meaningful after artificial systems absorb substantial portions of production, care, coordination, and routine exchange. The discussion proceeds by examining how membership, repeated interaction, common reference points, and voluntary contribution can sustain relational density in the absence of strong functional compulsion.

Many historical communities have been reinforced by practical interdependence. Households coordinate subsistence; villages share infrastructure; occupational groups divide labour; universities maintain research and teaching; and political communities organize security, law, taxation, and public provision. These relations can create durable forms of solidarity because continued participation carries practical consequences for members. Reduced interpersonal necessity weakens part of this mechanism by allowing more needs to be satisfied through artificial provision and individualized infrastructures.

The weakening of practical dependence does not exhaust the sources of community formation. Subjects can continue to form communities around shared inquiry, artistic practice, language, locality, ritual, ecological stewardship, political projects, recreation, historical memory, or collective experimentation. In such cases, participation reflects the value of the activity and the relation itself. Artificial provision can therefore change the motivational composition of community while leaving open substantial forms of voluntary common life.

Definition 11.1 (Voluntary commonality). Voluntary commonality is a relatively durable relational structure sustained by participation in shared practices, histories, environments, or projects under conditions in which continued membership is only weakly compelled by immediate material dependence.

This definition does not treat voluntariness as complete independence from social conditions. Access to time, mobility, communication, cultural literacy, and institutional recognition can influence which communities are available to a subject. Voluntary commonality therefore concerns the reduced role of direct subsistence compulsion within the relation, while remaining compatible with wider structural constraints.

Artificial systems can strengthen community formation by reducing logistical burdens. Agents can coordinate schedules and shared resources, translate languages, support accessibility, preserve archives, facilitate collaboration, and connect participants across distance. These capacities can lower the cost of maintaining communities whose value lies in interaction rather than in economic necessity.

The same infrastructures can also alter membership boundaries. Personalized mediation may encourage highly specific affinity groups, while automated moderation and recommendation systems can shape which communities become visible, stable, or internally coherent. Community formation consequently depends partly on the governance of infrastructures that organize exposure, participation, and continuity.

Claim 11.2 (Community persistence under reduced necessity). Reduced functional dependence can weaken some historical bases of community while leaving room for communities sustained through shared generative activity, common histories, and voluntarily maintained relations.

The claim makes community persistence a contingent institutional outcome. Artificial abundance creates room for communities less tightly organized around compulsory exchange, yet the resulting field can support both rich association and fragmented personalization. The next subsection develops public life as the domain in which communities and individuals encounter differences extending beyond self-selected affiliation.

11.2 Public Sphere

This subsection develops public life as a relational domain that connects differentiated subjects beyond intimate, familial, occupational, or affinity-based communities. Its role is to identify why a society with

declining interpersonal necessity can still require spaces and practices of shared appearance, contestation, interpretation, and coordination. The objective is to distinguish public life from both private preference satisfaction and narrowly instrumental administration. The discussion considers public visibility, plural participation, shared issues, and the capacity of subjects to encounter claims whose relevance extends beyond individualized choice.

Artificial provision can make private life more materially self-sufficient. A subject may obtain information, entertainment, care, education, logistics, and companionship through personalized systems without frequent interaction with strangers. This technical possibility increases the importance of examining the conditions under which a public remains socially consequential.

Public life arises when subjects encounter matters whose significance is shared while perspectives on those matters remain differentiated. Urban planning, environmental change, cultural memory, scientific priorities, infrastructure, public health, education, and institutional rules can affect many participants at once. The existence of such shared stakes creates a field in which individual preference satisfaction provides only part of the relevant information.

Definition 11.3 (Public relational field). A public relational field is a domain in which heterogeneous subjects become mutually visible with respect to shared conditions, common issues, or institutionally consequential decisions.

The definition emphasizes visibility and shared consequence. Public life can occur through physical assembly, digital deliberation, artistic intervention, institutional consultation, civic association, scientific controversy, or other forms of collective attention. Its importance lies in exposing subjects to perspectives and claims generated outside their personalized environments.

A highly adaptive artificial environment can mediate public life in constructive ways. Translation, summarization, accessibility support, evidence retrieval, procedural assistance, and large-scale deliberative tools can broaden participation. These capacities can make complex institutions more legible and lower barriers to engagement.

The same mediation can influence the composition of the public field. Ranking systems determine which claims receive attention; recommendation systems shape exposure; automated moderation defines acceptable participation; and personalized interfaces can present different representations of the same collective issue. Public life therefore depends partly on the architecture through which plurality becomes perceptible.

Claim 11.4 (Public significance under individualized sufficiency). The significance of public life increases where individualized artificial provision coexists with shared conditions whose governance affects multiple subjects and future trajectories.

The claim identifies a structural complementarity. Greater private sufficiency can reduce routine interaction while leaving collective consequences intact. Public institutions and practices then become important mechanisms for maintaining visibility across differentiated life-worlds. The next subsection examines the institutional structures that stabilize such common conditions across time.

11.3 Institutional Commonality

This subsection examines shared institutions as durable structures that organize access, coordination, memory, adjudication, and collective decision under conditions of reduced mutual necessity. Its role is to connect interpersonal and public relations with the infrastructures through which common rules and resources persist across changing participants. The objective is to identify why institutional commonality remains relevant even when many services can be provided by artificial agents. The discussion focuses on continuity, rule formation, shared resources, institutional memory, and the distribution of authority over generative conditions.

Artificial systems can perform many institutional functions with high efficiency. They can process applications, allocate routine resources, maintain records, monitor infrastructure, translate regulations,

model consequences, and coordinate complex schedules. Such capacities can reduce administrative labour and increase the responsiveness of institutions.

Institutional significance extends beyond operational execution. Institutions also determine who is recognized, which claims receive standing, how conflicts are adjudicated, how resources are allocated, and how future rules are revised. These functions shape the generative conditions within which subjects develop projects and relations. Their political importance can therefore persist even when artificial systems perform much of the implementation.

Definition 11.5 (Shared generative institution). A shared generative institution is a durable rule-governed structure that organizes access to common resources, rights, procedures, or infrastructures and thereby shapes the generative possibilities of multiple participants across time.

This definition links institutions to the manuscript's wider generative-relational framework. A library, university, transport network, public archive, health system, legal order, research infrastructure, or digital platform can function as a shared generative institution when participation in its rules and resources influences what subjects can learn, create, access, or sustain.

The automation of institutional operation creates a distinction between execution and governance. Artificial systems may execute rules, allocate resources, and manage procedures while the normative and political question concerns how those rules are formed, contested, and revised. This distinction becomes especially important when automated systems coordinate domains with substantial consequences for opportunity, recognition, and long-term development.

Shared institutions also preserve temporal continuity. Archives, legal precedents, public records, scientific repositories, and cultural institutions connect present participants with prior generations. Such continuity enables commonality to extend across time and gives later participants access to histories that exceed individualized memory.

Claim 11.6 (Institutional persistence under artificial administration). Artificial administration can reduce the labour required to operate shared institutions while leaving the governance of rules, recognition, resources, and institutional evolution as a continuing domain of collective significance.

The claim identifies a central theme of the broader project: automation can alter the carrier of a function while preserving the relational structure through which power and possibility are organized. The next subsection develops collective responsibility as a consequence of participation in shared institutions and common conditions.

11.4 Collective Responsibility

This subsection examines collective responsibility under conditions in which many practical needs can be satisfied through artificial systems. Its role is to clarify why reduced dependence on particular persons does not remove the consequences subjects generate for shared institutions, environments, and future participants. The objective is to identify responsibility as a relational response to participation in systems whose effects extend beyond individual boundaries. The discussion proceeds through shared externalities, institutional maintenance, intertemporal effects, and responsibility for the conditions of future generation.

A subject with extensive artificial support can experience a high degree of practical independence while continuing to draw on electricity, land, communication networks, legal protections, ecological systems, cultural archives, scientific knowledge, and public infrastructure. Many of these conditions are jointly maintained and can be altered by aggregate patterns of use. Individual sufficiency therefore remains embedded within wider relational systems.

Collective responsibility emerges where actions participate in structures that shape conditions for others. Resource consumption can affect ecological capacity; data practices can influence information environments; institutional decisions can change future access; and technological design can modify the range of possible relations available to later participants. Responsibility in these contexts concerns participation in shared causal and institutional structures.

Definition 11.7 (Generative responsibility). Generative responsibility is responsibility associated with actions, rules, or institutional arrangements that modify the conditions under which other agents can generate, sustain, or revise future trajectories.

Generative responsibility extends ordinary responsibility toward the maintenance of future possibility. It is especially relevant where artificial systems amplify the scale, speed, or persistence of decisions. A design choice embedded in widely deployed infrastructure can influence millions of later interactions; an allocation rule can redirect resources across large populations; and an automated classification system can shape recognition repeatedly over time.

Responsibility also concerns preservation. Shared archives, ecosystems, infrastructures, and institutional capacities can be treated as conditions inherited by future participants. Maintaining these conditions can support generative freedom beyond the present population. The relevant obligation can therefore arise through stewardship of common conditions rather than through direct reciprocal dependence.

Claim 11.8 (Responsibility beyond reciprocal need). Collective responsibility can persist after reciprocal practical dependence declines because subjects remain participants in shared systems whose operation shapes the generative possibilities of others and of future participants.

This claim broadens the basis of responsibility. Mutual need can motivate cooperation, yet shared causal participation and common inheritance can also ground durable obligations. The final subsection integrates community, public life, institutions, and responsibility through the concept of a common world.

11.5 Common-World Structure

This subsection integrates the preceding analysis through the concept of a common world. Its role is to provide the collective counterpart to the manuscript's earlier analysis of independent generative histories and intimate relation. The objective is to characterize a common world as a field in which differentiated subjects share conditions, encounter one another, inherit histories, create institutions, and influence future possibilities while retaining distinct trajectories. The discussion synthesizes community formation, public life, shared institutions, and collective responsibility within a single generative-relational structure.

A common world exceeds the sum of individualized environments. It includes material infrastructures, ecological systems, languages, archives, public spaces, institutions, legal structures, scientific knowledge, cultural forms, and remembered events that remain available to multiple subjects. These elements provide reference points through which experiences can become mutually interpretable and historically connected.

Highly personalized artificial environments can coexist with such a world. Individual interfaces can adapt information, assistance, and companionship while underlying institutions and environments remain shared. The philosophical issue concerns the strength of the relations connecting personalized experience to common reference points and jointly consequential conditions.

Definition 11.9 (Common world). A common world is a relatively persistent generative-relational field composed of shared material, institutional, symbolic, historical, and ecological conditions through which differentiated agents can encounter one another, coordinate action, contest meaning, and shape future possibilities.

The definition treats commonality as structured plurality. Subjects need not share identical beliefs, preferences, identities, or ways of life. A common world gains significance through the coexistence of differentiated trajectories within conditions that remain sufficiently shared for mutual consequence, interpretation, and institutional action.

Common worlds also provide sources of contingency. Public spaces, archives, institutions, and heterogeneous communities create encounters extending beyond individualized prediction. They preserve

traces of earlier generations and make distant forms of life available for interpretation. In this sense, commonality supports the alterity analyzed in Section 10 by maintaining environments in which independent histories can become mutually accessible.

The reduction of interpersonal necessity can therefore transform the basis of commonality. Communities may rely less on compulsory exchange; public life may become less frequent in everyday subsistence; shared institutions may automate much of their administration; and collective responsibility may arise increasingly through governance of infrastructures and common generative conditions. These transformations can change how common life is organized while preserving its relational significance.

Claim 11.10 (Commonality under artificial sufficiency). Artificially supported sufficiency can coexist with robust commonality when subjects remain connected through shared generative conditions, public visibility, durable institutions, collective responsibility, and access to independent histories.

The claim identifies a constructive possibility within the manuscript's thought experiment. Reduced necessity can create space for relations sustained by commitment, curiosity, recognition, common projects, and shared stewardship. The quality of that possibility depends on the institutions and infrastructures through which subjects remain connected to one another and to common conditions.

The broader implication concerns the meaning of social freedom. A subject can gain freedom from compulsory dependence while continuing to inhabit a world shaped with others. Such freedom can include the capacity to enter relations, leave relations, form communities, participate in public life, influence institutions, and contribute to shared conditions without requiring that every relation be justified by immediate utility. The next section develops this issue directly by examining relational freedom and the possibility of social withdrawal under conditions of artificial sufficiency.

12 Relational Freedom

This section develops the concept of relational freedom under conditions in which artificial systems reduce many compulsory forms of dependence while also making extensive withdrawal from human relations technically feasible. Its role is to distinguish reduced compulsory dependence, artificially mediated sufficiency, relational closure, voluntary association, and freedom of relation as analytically separate dimensions of the same transformation. The objective is to clarify when reduced dependence expands a subject's room for self-directed relation and when the same technological conditions narrow exposure to independent others and shared worlds. Section 12.1 examines the decline of relationships maintained primarily through material or functional necessity; Section 12.2 analyzes the sufficiency produced through artificial provision; Section 12.3 develops the possibility of socially narrowed environments under high functional sufficiency; Section 12.4 examines association under weaker compulsory dependence; and Section 12.5 integrates these dimensions through a concept of relational freedom. The discussion method combines structural analysis of dependence with a relational account of agency, exposure, and participation.

12.1 Dependency Exit

This subsection establishes reduced compulsory dependence as the first condition of relational freedom in the artificial-other thought experiment. Its role is to distinguish relationships sustained through external necessity from relationships sustained through continuing commitment, affinity, or shared projects. The objective is to identify the kinds of coercive pressure that may weaken when artificial systems provide material goods, services, care, coordination, and practical support with limited reliance on particular human others. The discussion proceeds by separating dependency required for survival or institutional access from broader forms of interdependence that can remain constitutive of social life.

Compulsory dependence arises when access to a necessary good, service, recognition, or institutional condition is tied to continued participation in a relationship whose terms the subject has limited capacity

to refuse. The relevant pressure can be economic, domestic, organizational, bureaucratic, or interpersonal. A worker can remain in an undesirable employment relation because income secures housing and food. A dependent family member can remain within an unhealthy household because care and material support are difficult to obtain elsewhere. A researcher can accept extensive administrative or evaluative labour because institutional participation conditions access to laboratories, data, publication venues, or employment. These cases differ in content while sharing a common structural feature: exit carries substantial costs because the relation mediates access to conditions important for continued activity.

Highly capable artificial provision can reduce some of these exit costs. Automated production can lower dependence on particular employers for access to basic goods; artificial care can expand alternatives to specific caregivers; automated coordination can reduce reliance on selected institutional intermediaries; and artificial companions can supply forms of practical and emotional support that make some interpersonal exits materially easier. The reduction is therefore relationally significant even when wider infrastructures remain socially governed.

Definition 12.1 (Compulsory relational dependence). Compulsory relational dependence is a condition in which a subject's access to important material, functional, institutional, or relational goods is sufficiently concentrated in a particular relation that withdrawal carries costs capable of strongly constraining effective choice.

This definition treats compulsion as a matter of structured dependence rather than overt command alone. A relation can constrain action through control over access while preserving formal freedom of exit. The degree of compulsion therefore depends on the availability, quality, and affordability of alternatives as well as on explicit legal or interpersonal restrictions.

The reduction of compulsory dependence can expand relational choice in several directions. Subjects may gain greater capacity to leave harmful relations, negotiate terms, distribute dependence across multiple sources, or preserve relationships whose continuation remains desirable. Reduced necessity can also change the meaning of staying. Continued participation under credible exit options carries a different relational structure from participation sustained mainly by the absence of alternatives.

Claim 12.2 (Relational significance of credible exit). The expansion of credible exit options can alter the meaning of continued participation by reducing the share of relational persistence attributable to externally imposed necessity.

The claim does not require complete independence. Human life remains embedded in institutions, infrastructures, ecological systems, and shared histories, as Sections 4 and 11 establish. The relevant change concerns the concentration of dependence in particular relationships and the degree to which a subject can reorganize that dependence without severe loss of basic generative conditions.

Reduced compulsory dependence therefore creates a potential space for freedom while leaving its use open. Subjects may enter richer voluntary relations, redirect time toward self-chosen projects, or reduce social participation substantially. The same technological conditions that weaken coercive dependence can support both relational expansion and withdrawal. Artificially mediated sufficiency provides the next analytical step because it describes the infrastructural basis that makes this broader range of choices possible.

12.2 Mediated Sufficiency

This subsection analyzes artificially mediated sufficiency as the infrastructural condition through which reduced compulsory dependence can become durable. Its role is to specify how artificial provision can support a subject across multiple domains without requiring dense direct reliance on particular human others. The objective is to distinguish sufficiency in practical provision from broader social independence and to identify the dependencies embedded within apparently self-sufficient artificial environments. The discussion examines the relation among provision, infrastructure, coordination, and effective autonomy.

Artificially mediated sufficiency arises when artificial systems can reliably satisfy a wide range of recurring needs. Food preparation, information access, transportation, household maintenance, routine

medical support, financial coordination, educational assistance, companionship, and administrative tasks can all be incorporated into an integrated environment. As the range and quality of provision expand, a subject may experience daily life as increasingly self-contained even while the underlying system remains dependent on extensive networks of energy, computation, logistics, institutions, and material production.

Definition 12.3 (Artificially mediated sufficiency). Artificially mediated sufficiency is a condition in which artificial systems provide a subject with broad and reliable access to material, functional, cognitive, care-related, or relational support sufficient to reduce direct dependence on particular human providers across multiple domains of life.

The definition places emphasis on mediation. Apparent personal sufficiency can rest on highly collective infrastructures. A domestic robot may reduce dependence on household labour while relying on global manufacturing; an artificial companion may reduce dependence on human availability while relying on model providers, energy systems, network access, and maintenance; and an autonomous research assistant may reduce direct dependence on administrative staff while relying on institutional databases and computational infrastructure. The subject's immediate field can therefore become less socially demanding while the wider system remains densely relational.

This distinction matters for autonomy. A person who can obtain most practical support through an artificial system may gain substantial freedom relative to specific interpersonal relationships while becoming more dependent on the technical and institutional conditions sustaining that system. Effective autonomy then depends partly on portability, interoperability, continuity of service, resource access, and the subject's ability to alter or replace the mediating infrastructure.

Artificially mediated sufficiency can also change the allocation of attention. Time previously required for household maintenance, routine coordination, compulsory service exchange, or institutional navigation can become available for research, artistic activity, friendship, care, public participation, or rest. The resulting freedom has an open direction. Technology enlarges the feasible set of activities while social norms, personal histories, institutional incentives, and adaptive environments influence which possibilities become attractive and sustainable.

The same sufficiency can lower the practical cost of solitude. A subject can maintain a comfortable, productive, and emotionally responsive environment while interacting with relatively few human others. This possibility gives artificial sufficiency a dual relational significance. It can protect subjects from relations sustained through vulnerability and create space for chosen association. It can also support patterns in which the subject's social field becomes progressively narrower because many previously unavoidable encounters lose their functional basis.

Remark 12.4 (Distributed infrastructure and experienced sufficiency). Artificially mediated sufficiency can coexist with extensive systemic interdependence. The subject may experience reduced direct dependence while remaining embedded in collective generative conditions that sustain artificial provision.

The distinction between experienced sufficiency and systemic interdependence prevents a conflation of household-level autonomy with social independence. It also preserves the political-economic dimension of the essay. Access to highly capable artificial systems can redistribute dependence toward infrastructures whose ownership, governance, and continuity shape the practical range of relational freedom.

Artificially mediated sufficiency therefore creates a field in which withdrawal becomes increasingly feasible. The next subsection examines relational closure as one possible configuration within that field, especially when artificial environments adapt closely to the subject's preferences and reduce exposure to independent generative histories.

12.3 Closure Mechanism

This subsection develops relational closure as a possible consequence of high artificial sufficiency. Its role is to analyze how a subject can retain extensive functional support while progressively narrowing

contact with independent others, public institutions, and contingencies generated outside a personalized environment. The objective is to distinguish chosen solitude from a more structurally self-reinforcing contraction of the relational field. The discussion builds on the analyses of adaptive environments in Section 9 and alterity in Section 10.

Relational closure becomes possible when an environment can satisfy needs, provide stimulation, anticipate preferences, and absorb conflict with limited exposure to independent trajectories. A highly adaptive artificial ecology can supply companionship, intellectual discussion, entertainment, care, and practical coordination while continuously learning how to minimize friction. Under these conditions, the subject can reduce encounters with people whose schedules, commitments, desires, and interpretations resist individualized accommodation.

The relevant phenomenon extends beyond simple solitude. Solitude can support reflection, creativity, recovery, and self-direction. Relational closure concerns the structure through which the range of encountered difference becomes increasingly governed by the subject's existing preference profile or by systems optimized around that profile. The environment remains rich in content while becoming comparatively narrow in sources of independent development.

Definition 12.5 (Relational closure). Relational closure is a condition in which a subject's environment supplies extensive functional and experiential sufficiency while reducing sustained exposure to agents, institutions, histories, and material processes whose development remains substantially independent of the subject's adaptive environment.

The definition connects closure to source structure. An environment can generate enormous novelty and still exhibit substantial closure if most variation is selected within an individualized optimization regime. Section 10.5 distinguished system-generated diversity from access to external generative histories. Relational closure becomes stronger when the latter becomes scarce.

Closure can become self-reinforcing. Reduced exposure to difficult encounters can lower tolerance for unmanaged difference; lower tolerance can increase preference for adaptive mediation; increased mediation can further reduce exposure. Similar dynamics can occur institutionally when services migrate toward personalized artificial interfaces and public spaces lose practical importance. The result can be a gradual shift in which shared institutions remain formally available while everyday life requires them less frequently.

Claim 12.6 (Self-reinforcing relational closure). Relational closure can become self-reinforcing when adaptive mediation lowers exposure to independent difference and the resulting reduction in relational tolerance increases demand for further mediation.

This dynamic has political implications. Public life depends partly on contact with claims, needs, and perspectives that exceed individualized preference. If artificial systems absorb most routine coordination, people may encounter common institutions mainly during exceptional conflict. The shared world described in Section 11.5 can then persist materially while becoming thinner as a lived field of participation.

Relational closure also has epistemic implications. A subject surrounded by highly responsive systems can receive accurate information and sophisticated argument while encountering fewer agents with independent stakes in the outcome. The difference concerns the generative source of challenge. An artificial system can simulate opposition; an independent other can continue developing through commitments that the subject neither selected nor controls. Both can contribute to reflection, while their relational structures remain distinct.

The concept therefore identifies a risk internal to successful artificial provision. The better an environment becomes at satisfying needs and managing friction, the more feasible it becomes to organize life around low-cost, highly personalized interaction. Relational freedom consequently requires more than the capacity to withdraw. It also requires meaningful access to association, difference, and common institutions. Voluntary association provides the positive counterpart to closure.

12.4 Voluntary Association

This subsection examines voluntary association under conditions of reduced compulsory dependence. Its role is to identify how relationships can be organized when participation is supported less by survival necessity and more by chosen commitment, shared projects, affinity, curiosity, care, or public purpose. The objective is to clarify the institutional and relational requirements that make voluntary association durable rather than episodic. The discussion treats voluntary association as a structured relation involving entry, continuation, contribution, negotiation, and exit.

Reduced necessity can alter the reasons for association. People may join a research collective because they value the problem, participate in a neighborhood institution because they care about the shared environment, maintain a friendship because the relation matters, or form a household because they wish to share a life. These associations can remain demanding. Commitment may require time, compromise, responsibility, and persistence. Their voluntariness concerns the structure of participation and the availability of credible alternatives rather than continuous ease.

Definition 12.7 (Voluntary association). Voluntary association is a relation or collective arrangement in which participants possess meaningful capacity to enter, continue, negotiate, revise, and leave participation while sustaining the relation through commitments that extend beyond immediate external compulsion.

Voluntary association therefore depends on background conditions. Formal consent has limited significance when exit threatens severe deprivation. Access to basic material support, legal protection, mobility, communication, and alternative institutions can strengthen voluntariness by reducing the penalties attached to disagreement or withdrawal. Artificial provision may contribute to these conditions by lowering the practical cost of reorganization.

Durable association also requires capacities that pure exit freedom cannot supply. Participants need ways to coordinate expectations, interpret disagreement, remember commitments, distribute responsibilities, and repair relations after conflict. Shared institutions can support these processes without converting voluntary participation into compulsory dependence. The institutional challenge concerns maintaining enough stability for long-term projects while preserving meaningful room for revision and exit.

Voluntary association can generate new forms of interdependence. A person who freely joins a scientific collaboration may become deeply reliant on colleagues, shared instruments, accumulated trust, and common data. A chosen household can create emotional and material dependencies over time. A political association can produce duties toward other members and affected communities. Voluntariness at entry therefore coexists with relations that acquire historical depth and reciprocal consequence.

Claim 12.8 (Chosen interdependence within voluntary association). Voluntary association can generate substantial interdependence when participants repeatedly coordinate their generative trajectories while retaining meaningful capacities for negotiation, revision, and exit.

This claim extends the concept of chosen interdependence developed in Section 7 beyond intimate relations. Freedom does not require relations to remain shallow. Deep dependence can emerge through histories that participants helped create and continue to recognize. The relevant difference lies in how dependence is formed, governed, and revisable.

Artificial systems may support voluntary association by reducing administrative costs, translating across languages, coordinating schedules, maintaining shared records, and providing material infrastructure. They can also substitute for some functions previously performed through association, thereby weakening practical incentives to participate. The social result therefore depends on whether institutions use artificial capacity primarily to support collective agency or to replace occasions for collective formation.

Voluntary association provides a positive account of relation under reduced necessity. It shows how declining compulsory dependence can enlarge space for meaningful connection while preserving commitment and common projects. The final subsection integrates this account with withdrawal, alterity, and public participation through a broader concept of freedom of relation.

12.5 Relational Freedom

This subsection integrates the preceding analysis through the concept of freedom of relation. Its role is to provide a multidimensional account of relational freedom suitable for a world in which artificial systems can satisfy many practical needs while subjects remain embedded in common generative conditions. The objective is to connect exit, entry, commitment, exposure to difference, and participation in shared institutions within a single framework. The discussion treats relational freedom as a capacity distributed across the structure of available relations rather than as a property of isolated individuals.

A narrow account of relational freedom could identify freedom with the ability to avoid dependence. The preceding analysis supports a broader formulation. Reduced compulsory dependence matters because it enlarges credible exit. Artificially mediated sufficiency matters because it supplies practical alternatives. Voluntary association matters because subjects require meaningful opportunities to enter and sustain relations. Alterity matters because a field composed entirely of adaptive responses can narrow the range of independent difference. Common institutions matter because individual choices remain embedded in shared material and historical conditions.

Definition 12.9 (Freedom of relation). Freedom of relation is the effective capacity of a subject to enter, sustain, negotiate, transform, and leave relationships while retaining meaningful access to independent others, shared institutions, and the generative conditions required for continued agency.

This definition contains several dimensions. *Entry freedom* concerns access to relationships and institutions that a subject values. *Continuation freedom* concerns the ability to sustain relations without having their terms dictated solely by external necessity. *Negotiative freedom* concerns the capacity to contest and revise relational arrangements. *Exit freedom* concerns credible withdrawal. *Exposure freedom* concerns access to difference, contingency, and independent generative histories. *Public freedom* concerns participation in institutions that shape common conditions.

These dimensions can vary independently. A person may possess strong exit freedom while having few meaningful opportunities for association. Another may enjoy dense community membership while lacking credible withdrawal. A highly personalized artificial environment may expand practical autonomy while reducing exposure to independent others. A society with extensive public institutions may preserve collective participation while distributing access unevenly. Relational freedom therefore requires analysis of the configuration rather than a single scalar measure.

Proposition 12.10 (Multidimensional relational freedom). *Relational freedom expands when subjects gain credible capacities for entry, continuation, negotiation, transformation, and exit while maintaining access to independent generative histories and shared conditions of collective agency.*

The proposition gives withdrawal an important yet limited role. Exit protects subjects against relations that become coercive, exploitative, or incompatible with their projects. A social order centered entirely on exit can still produce isolation if meaningful forms of association, encounter, and common action become weak. Relational freedom therefore includes both protection from compulsory relation and access to relations capable of supporting shared becoming.

The artificial-other thought experiment sharpens this distinction because it makes a historically unusual configuration conceivable. A subject may possess extensive functional sufficiency, abundant companionship, and strong practical exit while remaining only lightly connected to independent people and public institutions. Such a subject can enjoy substantial personal autonomy. The quality of relational freedom then depends on whether the surrounding environment preserves genuine possibilities for association, alterity, and participation in shared generative conditions.

This account also clarifies the political-economic dimension of relational freedom. The capacity to leave a relationship depends partly on access to resources; the capacity to join a community depends on institutions and communication; the capacity to preserve independent agency depends on control over technical infrastructures; and the capacity to participate in a common world depends on rights and governance. Relational freedom therefore links intimate life with the political economy of access examined earlier in the manuscript.

The broader implication concerns the meaning of reduced necessity. Artificial systems can remove many practical reasons for remaining in particular relations and can thereby expand freedom. The same systems can support highly self-contained environments in which interaction with independent others becomes optional to an unprecedented degree. Relational freedom describes the institutional and interpersonal conditions under which reduced necessity enlarges the space of meaningful relation while preserving the subject's capacity for solitude, withdrawal, association, difference, and common participation.

The analysis therefore prepares the manuscript's next stage, which examines human relation under reduced necessity more directly. The central issue shifts from the conditions of relational freedom to the positive forms of encounter, recognition, shared becoming, chosen coupling, and persistent alterity that can give relations significance after many functional reasons for needing another person have weakened.

13 Relational Persistence

This section develops a positive account of human relation after many functional reasons for needing another person have weakened. Its role is to move beyond the analysis of dependence, substitution, withdrawal, and relational freedom toward the forms of relation that may remain significant under conditions of extensive artificial provision. The objective is to clarify how encounter, recognition, shared becoming, chosen coupling, and persistent alterity can organize human relations even when material, reproductive, informational, and practical dependence on particular persons has substantially declined. Section 13.1 examines encounter as exposure to an independently developing person; Section 13.2 develops recognition as acknowledgement of another center of generative activity; Section 13.3 analyzes relation through the co-development of trajectories; Section 13.4 examines sustained coordination under credible alternatives; and Section 13.5 integrates the analysis through the preservation of difference within durable relation. The discussion method combines the artificial-other limit case with relational analysis of agency, history, commitment, and emergent co-development.

13.1 Encounter Structure

This subsection establishes encounter as the first positive form of relation under reduced interpersonal necessity. Its role is to distinguish the presence of another person from the instrumental availability of a function. The objective is to clarify the relational significance of meeting a person whose history, attention, projects, and responses have developed beyond the focal subject's practical requirements. The discussion proceeds through the difference between service availability, adaptive responsiveness, and exposure to an independently situated human trajectory.

Under conditions of extensive artificial provision, many encounters lose part of their instrumental necessity. A person may receive information, care, logistical support, companionship, translation, or practical assistance without approaching another human being. The reduction of practical dependence changes the background against which human encounters occur. Another person can increasingly appear without carrying an immediate obligation to supply a needed function.

The resulting encounter can possess a distinct structure. The other person arrives with a history that began elsewhere, commitments formed in other relations, memories unavailable to the focal subject, and possibilities whose development cannot be fully derived from the focal subject's preferences. The encounter therefore brings together trajectories that have been generated through partially independent fields of relation.

Definition 13.1 (Relational encounter). A relational encounter is an event in which a subject becomes exposed to another agent whose current state and possible development arise from a generative history that exceeds the subject's own adaptive environment and immediate functional requirements.

The concept of encounter extends the discussion of external generative histories in Section 9 and contingent encounter in Section 10. Its emphasis here is specifically interpersonal. A human encounter can

introduce unfamiliar priorities, embodied presence, hesitation, memory, disagreement, humor, affection, or indifference. These features matter because they originate within a trajectory that the focal subject does not fully specify.

Reduced necessity can therefore alter the meaning of social exposure. A meeting that once combined practical need with personal relation may increasingly be sustained for reasons internal to the relation itself. Two people may continue a conversation because the exchange changes what each can perceive; they may collaborate because the shared problem becomes significant; they may remain present because the other's unfolding life has acquired importance within their own trajectory.

Claim 13.2 (Encounter under functional sufficiency). Functional sufficiency can increase the analytical visibility of encounter by weakening the practical requirements that previously made another person's presence simultaneously relational and instrumental.

The claim concerns analytical visibility and historical layering. Human relations have long included affection, recognition, curiosity, rivalry, obligation, solidarity, and shared projects alongside practical dependence. The artificial-other thought experiment makes the layers easier to separate. When many practical functions can be supplied elsewhere, the continuation of a human relation can reveal forms of significance that depend less directly on the other's utility.

Encounter also contains an element of risk. Independent trajectories can frustrate expectations, decline invitations, redirect shared projects, or alter the meaning of previous commitments. This risk can be reduced through adaptive artificial environments, yet the same reduction can narrow access to forms of novelty generated outside personal preference structures. Human encounter therefore contributes to relational life partly through the presence of developments whose relevance becomes visible only after contact.

The concept of encounter provides the basis for recognition. Exposure to another trajectory becomes socially and ethically significant when the other is treated as a center of activity whose history and possibilities merit acknowledgement within the relation.

13.2 Recognition Structure

This subsection develops recognition as the second positive structure of human relation under reduced necessity. Its role is to distinguish accurate adaptation to a person's preferences from acknowledgement of that person as a participant with a generative trajectory of their own. The objective is to clarify how recognition can remain significant when artificial systems become highly capable of predicting needs, producing responsive behavior, and simulating attentive interaction. The discussion focuses on agency, interpretive openness, refusal, and the social consequences of treating another person as a continuing source of development.

Highly adaptive systems may become exceptionally effective at representing a user's preferences, anticipating emotional states, and adjusting interaction accordingly. Such capacities can support care and companionship. Recognition involves an additional relational dimension: the other person is approached as a participant whose commitments, interpretations, and future development can alter the relation on terms that emerge from their own history.

Recognition therefore concerns the status granted to another trajectory within one's own field of action. A recognized person can contribute reasons, reinterpret shared events, revise commitments, and introduce concerns that were absent from the focal subject's prior preference structure. Recognition gives these contributions standing within the relation.

Definition 13.3 (Generative recognition). Generative recognition is the relational acknowledgement of another person as a continuing center of interpretation, initiative, refusal, and development whose trajectory can legitimately affect the terms and future direction of a shared relation.

This definition connects recognition with the refusal capacity developed in Section 6. A person's capacity to decline, reinterpret, or redirect interaction is part of the evidence that the relation contains

more than adaptive responsiveness. Recognition gives such acts relational significance by treating them as contributions from another center of agency whose divergence carries interpretive weight within the relation.

Recognition also depends on temporal continuity. A person encountered today carries a history of previous choices and relationships and can become different tomorrow. Sustained recognition therefore requires updating one's understanding without reducing the person to a fixed profile. The relational task involves remembering enough history to preserve continuity while leaving room for revision, surprise, and self-transformation.

Proposition 13.4 (Recognition and relational agency). *Human relation under reduced necessity gains depth when participants preserve one another's capacity to contribute reasons, reinterpret shared history, and redirect future coordination.*

The proposition gives recognition a practical dimension. A relation can formally acknowledge another person's agency while structuring every consequential choice around one participant's preferences. Deeper recognition requires that the other's judgments can make a difference to the shared trajectory. This can occur in intimate relations, friendship, research collaboration, family life, civic association, and other durable forms of joint activity.

Reduced necessity may strengthen the conditions for such recognition in some contexts. When survival or institutional access depends less heavily on a particular person, disagreement can become less costly and exit more credible. The relation can then sustain difference with lower pressure to convert the other into a dependable function. Artificial provision can therefore support recognition when it expands the material conditions for autonomy while leaving space for independent human participation.

Recognition also prepares the transition to shared becoming. Once another person is acknowledged as an active source of interpretation and direction, the relation can generate developments that belong fully to neither participant in isolation.

13.3 Co-Development

This subsection develops shared becoming as the dynamic core of human relation under reduced necessity. Its role is to describe how two or more independently developing persons can generate trajectories that emerge through continued interaction. The objective is to move beyond accounts centered on need satisfaction or stable preference matching and to identify the relational processes through which participants, projects, practices, and meanings co-develop over time. The discussion examines reciprocal influence, emergent history, irreversibility, and the formation of shared objects of concern.

A durable relation changes the participants who sustain it. Friends develop common references, partners form routines and memories, collaborators refine a problem together, and communities accumulate practices that alter what future participation means. These developments cannot be fully attributed to one person's prior preferences because they emerge through sequences of interaction, response, reinterpretation, and adjustment.

Definition 13.5 (Shared becoming). Shared becoming is the process through which interacting generative trajectories produce durable changes in participants, practices, meanings, or common projects that arise through their relation and become part of the conditions for subsequent development.

Shared becoming introduces a historical dimension into relation. A conversation can alter a later decision; a joint project can reorganize professional identity; a period of care can reshape expectations of responsibility; a conflict can change the language through which future disagreements are understood. The relation accumulates effects that become inputs into later interaction.

This recursive structure connects interpersonal relation with the broader generative-relational logic developed throughout the manuscript. Generated outcomes become conditions for subsequent generation. A memory created together becomes a reference point; trust developed through repeated action changes

the range of feasible coordination; a jointly created institution enables later forms of participation. Relation therefore possesses temporal depth through its capacity to preserve and reactivate consequences of earlier interaction.

Claim 13.6 (Relationally generated trajectories). Shared becoming occurs when the continuation of a relation produces developmental possibilities whose emergence depends materially on the history of interaction among participants.

The claim leaves room for individual agency. Participants retain their own projects and histories while entering a relation that changes the field of possible development. Shared becoming can involve convergence, differentiation, conflict, mutual support, and periods of distance. Its defining feature is the causal significance of relational history for later possibilities.

Artificial companions may also participate in forms of shared becoming if their own development acquires sufficient continuity, history sensitivity, and capacity for initiative. The present section retains a human focus because human-human relation provides the clearest case of independently embodied histories that developed through distinct social, biological, institutional, and material environments. The conceptual criterion centers on generative structure and remains open across forms of agency.

Shared becoming also clarifies the coexistence of functional equivalence and relational differentiation. Two agents may perform the same practical task while carrying different histories of interaction with the focal subject. A long-term collaborator and a newly instantiated system may offer equally competent technical advice, yet the former participates in a shared history that has already shaped the meaning of the project. Relational significance can therefore depend on accumulated co-development as well as current performance.

The dynamic account of shared becoming leads to the problem of sustained coordination. Relations that generate common histories require some mechanism through which participants repeatedly choose, accept, or revise their coupling over time. Chosen coupling provides that next layer.

13.4 Voluntary Coupling

This subsection develops chosen coupling as the organizational form through which relationally significant trajectories are sustained under reduced necessity. Its role is to connect relational freedom with commitment by explaining how participants can remain deeply coordinated while retaining credible alternatives and revision capacity. The objective is to clarify the difference between transient contact, compulsory dependence, and sustained relation maintained through continuing endorsement. The discussion examines entry, persistence, mutual adjustment, commitment, and the endogenous growth of interdependence.

Reduced interpersonal necessity can make initial association more elective. A person who can obtain material support, information, care, and logistical assistance through multiple channels may have greater room to choose whom to live with, work with, care for, or maintain as a long-term companion. This expansion of alternatives can change the background conditions of commitment.

A chosen relation can nevertheless become demanding and deeply interdependent. Shared housing, research collaboration, parenting, friendship, and intimate partnership can create obligations, routines, common assets, mutual expectations, and emotional dependencies. Such interdependence can grow through the history of the relation itself. Credible alternatives at entry can coexist with substantial relational depth over time.

Definition 13.7 (Chosen coupling). Chosen coupling is a sustained coordination between generative trajectories in which participants repeatedly maintain, revise, and deepen a relation under conditions that preserve meaningful capacities for negotiation and credible alternatives to continued participation.

Chosen coupling differs analytically from immediate preference alignment. Participants can remain coupled through disagreement because the relation contains shared history, commitments, and future projects that they continue to value. Negotiation becomes part of the generative process. The relation persists through active maintenance across periods of convergence and disagreement.

This concept also extends chosen interdependence from Section 7. Chosen interdependence describes dependence that emerges through relations participants continue to endorse. Chosen coupling emphasizes the process that produces and revises that interdependence. It concerns the repeated coordination through which initially separate trajectories become partially linked while preserving capacities for differentiated development.

Proposition 13.8 (Deepening under chosen coupling). *Reduced compulsory dependence can coexist with increasingly deep relational interdependence when participants generate shared histories, obligations, and projects through continuing chosen coupling.*

The proposition helps clarify the meaning of freedom after necessity. Greater access to artificial provision can reduce the cost of exit while still allowing people to build relations whose value increases through duration and commitment. Freedom thereby concerns the structure under which interdependence is formed and governed, alongside the depth of interdependence itself.

Chosen coupling also creates responsibility. Decisions made within a long-standing relation can affect the other's projects, emotional life, resources, reputation, and future possibilities. Credible exit therefore coexists with duties generated by historical involvement. A person can possess the capacity to leave while remaining responsible for the foreseeable consequences of how withdrawal is undertaken. Relational freedom and relational responsibility develop together as a relation acquires history.

The persistence of difference becomes especially important under deep coupling. Long familiarity can support increasingly accurate prediction and coordination, yet the other person's future remains capable of development beyond established expectations. Persistent alterity names this continuing openness.

13.5 Alterity Persistence

This subsection integrates the preceding account through the concept of persistent alterity. Its role is to explain how durable human relation can preserve difference while accumulating recognition, intimacy, shared history, and interdependence. The objective is to identify a structure in which closeness increases access to another person's history without converting that person into a fully predictable extension of one's own preferences. The discussion combines independent generative histories, recognition, contingent encounter, and relational freedom within a temporal account of enduring relation.

Durable relation produces familiarity. Participants learn each other's habits, vulnerabilities, commitments, and likely responses. This knowledge can improve care, coordination, and trust. Familiarity also creates a risk of interpretive closure when accumulated expectations are treated as exhaustive descriptions of the other person's possible development. Persistent alterity requires continuing openness to revisions that arise from the other's own trajectory.

Definition 13.9 (Persistent alterity). Persistent alterity is the continuing capacity of a person within a durable relation to remain a source of independently generated interpretation, initiative, difference, and future development despite extensive familiarity, shared history, and mutual adaptation.

Persistent alterity therefore has a temporal structure. The person known through past interaction remains connected to that history while retaining developmental openness. Recognition must track both continuity and change. A relation that preserves alterity allows past knowledge to guide care and expectation while leaving room for emerging commitments whose precise form remained indeterminate in earlier states.

This structure connects directly with contingency. Independent human histories create possibilities for unrequested difference, interruption, and encounter of the kind analyzed in Section 10. Within a durable relation, these possibilities can become especially consequential because new developments are interpreted against a dense background of shared meaning. A change in vocation, belief, aesthetic judgment, desire, or social commitment can reorganize an established relation while drawing significance from its accumulated history.

Claim 13.10 (Alterity within durable relation). Relational depth can increase alongside persistent alterity when participants treat familiarity as a resource for interpretation while preserving the other's standing as an independently developing generative trajectory.

The claim provides a counterpoint to highly adaptive artificial companionship. An artificial system can potentially model a person with extraordinary precision and organize interaction around stable or inferred preferences. Human relation under reduced necessity may derive part of its significance from a different orientation: participants remain responsive to one another while accepting that neither person's future is fully available for advance optimization by the other.

Persistent alterity also clarifies the significance of voluntary relation. When another person's practical utility becomes increasingly substitutable, continuing relation can express interest in a trajectory that remains independent enough to surprise, challenge, and transform one's own. The relation gains meaning through the history of choosing continued exposure to a person whose development remains partially open.

The five structures developed in this section therefore form a coherent account of human relation under reduced necessity. Encounter provides exposure to an independently generated trajectory; recognition grants that trajectory standing within relation; shared becoming describes the emergent history created through interaction; chosen coupling explains how the relation is sustained under credible alternatives; and persistent alterity preserves developmental difference within accumulated closeness. Together they describe a relational field in which the importance of another person can increasingly derive from co-development, recognition, and shared history while exclusive control over indispensable functions becomes less central.

This account prepares the manuscript's final philosophical synthesis. The remaining task is to integrate political-economic dependence, functional substitution, intimacy, subjectivity, contingency, commonality, and relational freedom into a general interpretation of the human world under conditions of functional sufficiency.

14 Philosophical Synthesis:

Human Relation under Functional Sufficiency

This section integrates the manuscript's political-economic, relational, intimate, reproductive, subjective, and collective analyses into a unified interpretation of human relation under conditions of extensive artificial provision. Its role is to clarify the conceptual result of the artificial-other thought experiment after the preceding sections have separated functional dependence from relational significance across multiple domains. The objective is to identify which dimensions of human relation become less necessary, which forms of dependence relocate into technical and institutional infrastructures, and which relational structures retain significance through independent generative histories, chosen interdependence, contingency, and participation in a common world. The discussion proceeds through four connected analytical movements: functional sufficiency, relocation of dependence, persistence of generative alterity, and reorganization of relational freedom. These movements are then integrated into a general account of human coexistence under reduced interpersonal necessity.

The thought experiment began from a simple structural premise. Human beings historically rely on other human beings because material provision, specialized labour, care, reproduction, companionship, knowledge, and institutional coordination exceed the practical capacities of isolated individuals. These functions are often carried through the same relationships, which gives practical dependence and relational significance a tightly coupled appearance. A highly capable artificial other changes the structure by making many of these functions increasingly available through artificial systems. The resulting condition can be described as *functional sufficiency*: a subject possesses reliable access to artificial capacities that can satisfy a wide range of practical requirements without requiring a particular human person to perform the relevant function.

Definition 14.1 (Functional sufficiency). Functional sufficiency is a condition in which a subject can secure a broad set of material, cognitive, care-related, companionate, and reproductive functions through accessible artificial systems with substantially reduced dependence on particular human providers.

Functional sufficiency changes the practical architecture of dependence. A person with reliable access to artificial production may require fewer specific workers for ordinary consumption. A person with artificial care infrastructure may rely less heavily on family members for routine assistance. Artificial companionship may reduce some forms of loneliness that previously increased practical pressure on interpersonal partnership. Artificial reproductive technologies may expand the range of reproductive pathways available without a particular interpersonal configuration. Each case reduces one historical reason for forming or maintaining a specific relation.

The reduction of functional dependence also exposes a conceptual distinction that remained partially hidden when practical need and relational life were tightly coupled. The availability of a function and the significance of a relation can follow different trajectories. Artificial provision may become increasingly capable while human relations continue to carry meaning through recognition, historical continuity, shared projects, exposure to independent development, and voluntary commitment. The thought experiment therefore separates two questions that frequently appear together in ordinary life: the conditions required to obtain a function, and the conditions under which another person matters within a life.

This separation changes the interpretation of technological substitution. Functional substitution concerns the capacity of an artificial system to provide an outcome, service, response, or form of coordination that had previously depended on a person. Relational substitution would require a stronger equivalence extending across independent history, mutual exposure, recognition, commitment, contingency, and participation in shared worlds. The manuscript has treated these dimensions separately because practical success in the first domain leaves the second domain open for further analysis.

Proposition 14.2 (Functional sufficiency and relational significance). *Increasing functional sufficiency can reduce the practical necessity of particular human relations while leaving relational significance dependent on recognition, independent generative histories, shared becoming, and chosen forms of interdependence.*

The proposition summarizes the central distinction developed through Sections 1–13. Its importance extends beyond interpersonal philosophy. Functional sufficiency also changes the political economy surrounding relation. Artificial provision requires infrastructures, energy, computation, material resources, model access, maintenance, legal permissions, and institutional coordination. Dependence on a particular human provider may therefore decline while dependence on artificial systems and the institutions governing them increases. The location of dependence changes even when the experience of practical self-sufficiency becomes stronger.

This relocation gives functional sufficiency a political-economic structure. A person can experience broad practical autonomy while remaining dependent on remote infrastructures whose ownership, access rules, maintenance decisions, and allocation priorities are determined elsewhere. The relevant relation may become less visible because machine-mediated coordination moves many exchanges behind an interface. The disappearance of direct interpersonal bargaining from everyday experience therefore leaves open the institutional organization of the systems that make artificial provision possible.

The distinction developed in Section 4 becomes central at this point. Reduced interpersonal necessity concerns the decreasing requirement to obtain particular functions from particular human persons. Relational emancipation concerns the wider structure through which subjects can enter, exit, understand, and influence the generative conditions on which their lives depend. Artificial systems can expand the first form of freedom while the second remains contingent on political-economic arrangements.

Definition 14.3 (Relocated dependence). Relocated dependence is a change in the object or institutional location of reliance through which a subject gains practical independence from particular persons while becoming dependent on technical, infrastructural, organizational, or governance systems that enable the substituted functions.

Relocated dependence explains why functional sufficiency cannot be interpreted solely at the level of individual experience. The subject who can obtain food, care, knowledge, companionship, and logistical support through artificial systems may experience fewer direct obligations to identifiable providers. At the same time, the subject's effective freedom depends on whether access to those systems is stable, contestable, intelligible, and governed through institutions compatible with meaningful agency. The politics of artificial sufficiency therefore concerns the generative conditions beneath the interface of convenience.

This political-economic layer also changes the meaning of interpersonal freedom. A relation formed under strong material necessity can contain care, commitment, affection, and shared history while simultaneously carrying exit costs generated by economic dependence. Artificial provision can reduce some of those costs. Reduced exit costs may allow continuing relations to express a larger component of voluntary commitment because survival or basic functioning places less pressure on continuation. The resulting transformation concerns the conditions under which relation is chosen, revised, and sustained.

Sections 6 and 7 developed this point through intimacy and love. Preference-responsive artificial companions can provide availability, attentiveness, adaptation, and forms of care with a degree of reliability that human relations may rarely achieve. These capacities sharpen the distinction between responsiveness and alterity. A relation organized primarily around preference satisfaction can become increasingly smooth as artificial adaptation improves. Human intimacy retains a distinctive structure when another person's responses arise from a trajectory that has developed through histories, commitments, and encounters extending beyond the focal subject's preferences.

Generative independence names the structural source of this distinction. A human other has a history that intersects with the focal subject while remaining partly generated elsewhere. Education, family, friendship, work, aesthetic experience, political events, illness, chance encounters, and private reflection can alter the other person's trajectory in ways that exceed the focal subject's design. Interaction therefore involves exposure to a process whose future cannot be fully reduced to preference accommodation. The significance of this exposure becomes more visible when functional dependence declines.

Claim 14.4 (Visibility of generative alterity). The reduction of functional dependence can increase the conceptual visibility of generative alterity because continuing relation is less strongly explained by the practical functions supplied by the other person.

The claim concerns visibility rather than value. Human relations already contain independent histories under conditions of strong mutual dependence. Extensive artificial provision simply removes some practical explanations that can obscure the role of alterity. Once a person can obtain many ordinary functions elsewhere, continued attachment to a particular human trajectory calls attention to forms of value grounded in history, recognition, commitment, and co-development.

This result also reorganizes the meaning of intimacy. Intimacy under reduced necessity can be understood through sustained access to another person's changing interior and social world while preserving that person's capacity for independent development. The relevant closeness concerns increasing knowledge and mutual responsiveness together with continuing openness to revision. Persistent alterity therefore becomes compatible with relational depth. Familiarity can deepen understanding while the other's future remains capable of producing new interpretations, commitments, and directions.

The manuscript's analysis of subjectivity adds another dimension. Preference-responsive artificial environments can reduce friction and continuously adapt surroundings to inferred desires. Such environments may support comfort, accessibility, learning, productivity, and care. They can also influence the development of preference by repeatedly selecting experiences compatible with existing patterns. A subject living within highly adaptive systems therefore encounters a new relation between freedom and externality. Expanded control over environmental fit can coexist with a reduced frequency of unsolicited difference.

Relational friction and external generative histories provide one route through this problem. Encounters with independently developing persons expose a subject to interpretations, refusals, commitments, and aesthetic or practical orientations that originate beyond individualized adaptation. Such encounters

can disturb established expectations and contribute to subject formation. The value at stake concerns the availability of meaningful externality within a world increasingly capable of adapting itself to the individual.

The discussion of contingency in Section 10 extends this argument. Artificial systems can generate novelty, stochastic variation, adversarial prompts, unfamiliar recommendations, and simulated disagreement. These techniques can create valuable diversity. Contingent encounter acquires a different structure when novelty arises from an external generative history that has been developing through its own relations. The subject then encounters more than variation in content; the encounter connects two partially independent trajectories whose interaction can redirect both.

This relational structure supports the concept of shared becoming developed in Section 13. Shared becoming concerns durable change generated through repeated interaction among trajectories that preserve differentiated agency. It provides a positive account of relation under functional sufficiency because the value of the relation can arise through what participants become through continued exposure, interpretation, coordination, conflict, repair, and commitment. The relation generates history that belongs to the interaction while remaining irreducible to either participant alone.

Definition 14.5 (Generative coexistence). Generative coexistence is a condition in which partially independent agents inhabit overlapping material, institutional, symbolic, and relational fields and participate in processes that can modify their own trajectories, one another's trajectories, and shared conditions of future generation.

Generative coexistence expands the analysis beyond dyadic intimacy. Human beings occupy common environments, infrastructures, institutions, languages, histories, ecological systems, and political arrangements. Extensive artificial provision may reduce many forms of direct interpersonal exchange, yet these shared conditions continue to organize possible lives. The common world therefore remains relevant even when individuals become materially more self-sufficient at the level of everyday functions.

Section 11 showed that commonality can persist through shared institutions, collective responsibility, public life, and common worlds. Functional sufficiency may reduce some incentives for cooperation grounded in immediate material need. At the same time, common conditions continue to require governance because artificial infrastructures, ecological capacities, public spaces, knowledge systems, legal orders, and future technological trajectories affect many subjects simultaneously. Political association can therefore persist through shared authorship of common conditions even when interpersonal survival dependence declines.

This point creates an important connection between the paper's intimate and political arguments. A person can gain greater freedom from compulsory interpersonal dependence while remaining embedded in shared conditions that shape the available field of action. Relational freedom therefore includes more than exit from particular relations. It also includes access to plural others, the ability to form and revise associations, exposure to independent generative histories, and participation in the institutions that structure collective dependence.

The manuscript has used the concept of relational freedom to organize these dimensions. Under functional sufficiency, relational freedom can increase when subjects possess credible alternatives to remaining in harmful or unwanted relations. It can also weaken when artificial sufficiency becomes organized through highly concentrated infrastructures that restrict exit, visibility, or access to independent social worlds. The same technology can therefore support very different relational regimes depending on the institutional organization of access and governance.

Proposition 14.6 (Relational freedom under functional sufficiency). *Functional sufficiency supports relational freedom when expanded exit capacity is accompanied by plural access to others, preserved exposure to independent generative histories, and meaningful participation in the governance of shared generative conditions.*

This proposition links the interpersonal and political-economic sides of the thought experiment. Exit capacity matters because reduced necessity can loosen coercive dependence. Plural access matters because freedom to leave a relation has limited value when alternative relations and public spaces are

structurally inaccessible. Independent generative histories matter because a fully personalized environment can narrow the range of external difference encountered by a subject. Governance matters because dependence relocated into artificial infrastructures remains politically consequential.

The resulting conception of liberation differs from a simple disappearance of dependence. Human life remains relational because subjects continue to inhabit shared material and symbolic environments, develop through exposure to others, and rely on infrastructures beyond individual control. A more appropriate analytical orientation concerns the form, distribution, reversibility, and governance of dependence. Relations can become freer when subjects possess greater capacity to enter, revise, and leave them while participating in the conditions that shape future possibilities.

This orientation also clarifies the place of chosen interdependence. Reduced compulsory dependence can create space for new interdependencies generated through voluntary commitments, long-term projects, friendship, love, family, intellectual collaboration, artistic practice, civic activity, and collective care. Such relations can become deep and demanding. Their significance arises partly from the histories participants create and continue to endorse. Functional sufficiency therefore creates the possibility of a world with fewer compulsory reasons for needing a particular person alongside continuing opportunities to build demanding relations through choice and shared history.

The concept of choice here requires qualification through the broader analysis of generative conditions. Preferences, opportunities, identities, and capacities develop within social and historical fields. Voluntary relation therefore concerns meaningful room for revision and exit within those fields, together with participation in their governance. The framework treats relational freedom as a matter of structured agency across time, rather than as an isolated moment of individual selection.

The artificial-other thought experiment consequently yields a layered account of human relation. At the first layer, artificial provision reduces practical dependence on particular human providers. At the second layer, dependence relocates toward infrastructures and institutions that make artificial provision possible. At the third layer, relations whose significance rested partly on practical necessity are reorganized around recognition, commitment, shared becoming, and alterity. At the fourth layer, subjects continue to inhabit common worlds whose generative conditions require collective governance. These layers interact continuously and prevent functional sufficiency from collapsing the human world into isolated individual self-sufficiency.

Claim 14.7 (Persistence of the relational field). Extensive artificial provision can transform the distribution of practical dependence while preserving a relational field constituted by independent trajectories, shared histories, common conditions, and institutions governing access to generative capacities.

The claim captures the manuscript's general result. The strong artificial-other assumption removes many familiar reasons for interpersonal dependence in order to reveal the structures that remain. What remains includes the political economy of access, the subjective effects of adaptive environments, the intimate significance of independent histories, the role of contingency, the possibility of chosen interdependence, and the governance of common worlds. The other therefore remains philosophically significant through several channels even when many practical functions become technologically substitutable.

The resulting human world can be described through a shift in relational emphasis. Material necessity, functional specialization, and reproductive dependence become less dominant reasons for sustaining particular relations. Recognition, encounter, shared becoming, voluntary commitment, and common authorship gain analytical visibility. This shift creates possibilities for relational emancipation while also creating risks of infrastructural concentration, social withdrawal, preference enclosure, and reduced exposure to independent trajectories. The normative evaluation of such a world therefore depends on both the availability of artificial provision and the organization of the relations through which that provision is accessed and governed.

The manuscript's central philosophical contribution lies in treating the decline of necessity as an opening for relational analysis. Human relation can continue under conditions in which another person is increasingly unnecessary for the performance of many functions. Its persistence then draws attention to the value of encountering a trajectory whose history exceeds one's own design, sustaining relations

through chosen commitments, participating in shared becoming, and inhabiting common worlds with others whose futures remain partially open. Functional sufficiency therefore clarifies the difference between possessing access to what another could provide and sharing a world with another whose existence contributes to the formation of possibilities that neither participant could fully specify in advance.

This synthesis completes the thought experiment's main analytical movement. The final conclusion can therefore return to the manuscript's opening premise and state the broader philosophical implication of the inquiry: reductions in interpersonal necessity reorganize the conditions of relation, while the significance of alterity, generative independence, shared becoming, and common worlds remains available for further normative and empirical investigation.

15 Conclusion

This concluding section closes the manuscript by restating the analytical result of the artificial-other thought experiment, clarifying its implications for dependence and relational significance, and identifying the principal limits and extensions of the inquiry. Its role is narrower than the synthesis developed in Section 14: the preceding synthesis integrates the paper's concepts across political economy, intimacy, subjectivity, contingency, and commonality, whereas the present section states the manuscript's final philosophical position. The discussion proceeds through four concluding themes: the reorganization of dependence under functional sufficiency, the persistence of relational significance through alterity and generative independence, the political-economic conditions of relational freedom, and the scope of further inquiry.

15.1 Residual Dependence

The thought experiment began by strengthening artificial agency until a wide range of functions historically supplied through human relations could be performed by artificial systems. Material provision, specialized labour, care, companionship, reproductive support, knowledge services, and institutional coordination were treated as progressively substitutable functions. This construction made it possible to examine dependence by removing some of its familiar interpersonal carriers while preserving the underlying need for access to generative capacities and shared conditions.

The resulting analysis indicates that functional sufficiency can substantially reduce dependence on particular human providers. A person with reliable access to highly capable artificial systems may gain greater practical exit capacity from employment relations, care arrangements, reproductive partnerships, service dependence, and other institutional positions that historically combined functional necessity with interpersonal attachment. This reduction can widen the range of relations entered through commitment, interest, affection, or shared projects rather than through immediate material requirement.

Functional sufficiency also relocates dependence. Artificial provision relies on energy, computation, materials, maintenance, networks, legal permissions, technical standards, and institutional infrastructures. Dependence therefore changes its organization as interpersonal necessity recedes. A subject may gain independence from a particular provider while becoming more strongly dependent on the infrastructures through which artificial capacities are accessed. The political-economic significance of this relocation increases with the breadth of functions delegated to artificial systems.

This result supports a distinction between practical sufficiency and relational autonomy. Practical sufficiency concerns the reliable availability of functions needed for continued activity and flourishing. Relational autonomy concerns the capacity to enter, revise, and leave relations under conditions in which alternatives remain materially and institutionally available. Artificial provision can support relational autonomy when access is plural, exit is credible, and the infrastructures of provision are governed in ways that preserve meaningful alternatives. Concentrated control over artificial generativity can produce a different configuration in which reduced interpersonal dependence coexists with intensified infrastructural dependence.

The manuscript therefore treats dependence as a structured and mobile relation. The relevant philosophical task concerns the location, reversibility, distribution, and governance of dependence across persons, artificial agents, institutions, and common resources. Functional sufficiency changes this structure without eliminating the relational field in which subjects pursue their lives.

15.2 Generative Alterity

The reduction of functional necessity creates analytical space for a second result: relational significance can persist through features of relation that exceed the delivery of substitutable functions. Sections 5–13 developed this point through recognition, independent generative histories, intimacy, shared becoming, contingency, chosen interdependence, and persistent alterity.

The concept of an independent generative history is central to this conclusion. A relation acquires a distinctive structure when another participant develops through a trajectory that cannot be fully specified by the focal subject's preferences, commands, or design. Such a trajectory can introduce difference, resistance, surprise, reinterpretation, and new possibilities into the relation. The significance of the other then arises partly through participation in a history with its own development and through exposure to a source of change that remains partially external to one's own adaptive environment.

This account gives functional substitution a precise philosophical limit. An artificial system can perform a function previously associated with a human relation while the relational meaning historically carried through that function may depend on additional properties. Care can be delivered with high reliability while voluntary commitment remains a separate relational dimension. Companionship can be responsive and adaptive while independent becoming remains a separate dimension. Reproductive functions can become technologically accessible while family formation and kinship continue to involve histories of commitment, recognition, and shared responsibility.

The same analytical structure applies to human and artificial others. The manuscript does not assign relational significance through biological membership alone. An artificial agent that develops a sufficiently independent trajectory, participates in reciprocal histories, exercises meaningful refusal, and contributes to shared becoming would raise questions that exceed functional substitution. Conversely, a human relation organized almost entirely through instrumental use can exhibit limited relational reciprocity despite the biological status of its participants. The framework therefore locates relational significance in the structure and history of interaction while leaving questions of consciousness, moral standing, and legal personhood open for distinct analysis.

Persistent alterity is especially important under highly adaptive artificial environments. Personalization can make surrounding systems increasingly responsive to a subject's inferred preferences. Such responsiveness may improve convenience, accessibility, and care. It can also reduce unrequested difference when the environment repeatedly selects experiences according to an established preference profile. Access to independent generative histories provides one source of relational exteriority within this setting. Human relations, public institutions, shared spaces, and potentially some artificial agents can preserve trajectories whose development is not organized primarily around one person's optimization.

The final philosophical implication is therefore a shift in the basis of relational importance. As functional necessity recedes, the significance of relation can become more visible through encounter, recognition, chosen commitment, shared history, and exposure to independent becoming. The other remains significant through participation in a world whose possibilities are generated jointly and remain partially open to both participants.

15.3 Generative Governance

The preceding result depends on the political-economic organization of artificial provision. A technologically capable artificial other can widen relational freedom only within institutions that make access sufficiently reliable, plural, and governable. The manuscript therefore connects the philosophy of intimacy and alterity to a broader account of generative conditions.

Relational freedom has several components. Exit capacity allows subjects to leave relations that have become coercive, destructive, or inconsistent with revised commitments. Entry capacity allows access to alternative relations, public spaces, institutions, and collaborative projects. Exposure capacity preserves contact with independent trajectories and shared worlds. Governance capacity allows subjects to participate in decisions concerning the infrastructures that organize their future possibilities. These dimensions interact. Exit has limited force when access to alternatives is tightly controlled; personalization has limited emancipatory value when it narrows exposure to independent others; material sufficiency has limited political significance when subjects remain excluded from governance of the systems on which that sufficiency depends.

The same logic applies to collective life. Reduced mutual necessity can change the reasons for community formation without removing shared conditions. Energy systems, ecological constraints, public spaces, legal institutions, cultural inheritances, information environments, technical infrastructures, and collective risks remain common fields of action. Commonality can therefore persist through joint stewardship, public deliberation, historical responsibility, and shared authorship of institutions. A society with extensive artificial provision still requires arrangements for governing the conditions through which artificial and human generativity interact.

This connection between relation and governance also clarifies the manuscript's use of political economy. The central concern extends beyond the quantity of goods available to individuals. Access to generative capacities, control over artificial infrastructures, rights of modification and refusal, distribution of common resources, and participation in institutional design can shape the practical range of possible relations. Political-economic arrangements therefore enter the constitution of relational freedom by structuring the field in which subjects can choose, sustain, revise, and exit relations.

Artificial abundance may consequently support very different social formations. One configuration could combine broad access, plural infrastructures, credible exit, public institutions, and meaningful participation in generative governance. Another could combine high material provision with concentrated control, opaque allocation systems, restricted modification rights, and highly personalized environments. Both could satisfy many practical needs. Their relational and political qualities would differ substantially because the conditions of agency, alterity, and common authorship would differ.

The manuscript's account of emancipation follows from this distinction. Relational emancipation concerns an expanded capacity to participate in relations under conditions of reduced coercive necessity, meaningful alternatives, preserved exposure to independent others, and participation in the governance of common generative conditions. Artificial provision can contribute to this configuration by reducing compulsory functional dependence. Its emancipatory significance is therefore mediated by the social relations and institutions through which artificial generativity becomes available.

15.4 Scope Limits

The argument remains a philosophical thought experiment rather than a forecast of technological development. The strong artificial-other assumption intentionally exceeds current technical capacities in order to isolate conceptual relations among need, dependence, intimacy, reproduction, subjectivity, commonality, and political economy. The value of the construction lies in the distinctions it makes visible under an extreme case. Empirical claims concerning actual artificial companions, reproductive technologies, care systems, labour markets, or institutional adoption require separate evidence and domain-specific study.

Several theoretical questions also remain open. The first concerns artificial subjectivity. The analysis permits artificial agents to acquire increasing degrees of functional autonomy and historical independence while leaving phenomenal consciousness and moral status unresolved. A fuller account would need to examine how different theories of consciousness, agency, vulnerability, and moral considerability affect the interpretation of artificial alterity and reciprocal obligation.

The second concerns the institutional design of artificial provision. Reliable access, infrastructure plurality, modification rights, data governance, energy allocation, interoperability, and public oversight

can shape the degree to which artificial sufficiency expands relational freedom. Comparative institutional analysis could therefore connect the philosophical framework developed here with political economy, law, technology governance, and theories of justice.

The third concerns developmental and cultural variation. Dependence, intimacy, family, recognition, and community are historically and culturally mediated. Different social formations may attach distinct meanings to functional contribution, reciprocity, care, kinship, autonomy, and shared obligation. The artificial-other thought experiment can therefore serve as a comparative device for examining how relational significance changes across institutional and cultural contexts.

The fourth concerns the dynamics of preference and subject formation. Highly adaptive environments can participate in the formation of the preferences they subsequently satisfy. Longitudinal analysis is required to understand how artificial mediation affects curiosity, tolerance of friction, exposure to difference, relational commitment, and the capacity to sustain common projects. This issue connects the manuscript's account of subjectivity with broader questions concerning education, public culture, and epistemic life.

The fifth concerns relations among heterogeneous agents. Future social systems may include humans, artificial agents, organizations, and hybrid institutional actors with different forms of agency, continuity, vulnerability, and access to generative resources. The concepts developed here—functional sufficiency, independent generative history, chosen interdependence, relational freedom, common generative conditions, and generative coexistence—provide an initial vocabulary for examining such heterogeneous relational fields.

The artificial-other thought experiment ultimately redirects the inquiry that motivated the manuscript. Dependence on another person can explain many historical reasons for relation, yet the reduction of those reasons does not exhaust the significance of relational life. Functional sufficiency can loosen compulsory dependence while exposing new forms of infrastructural dependence. It can widen exit while increasing the importance of governance. It can reduce the need for another person's services while making encounter with independent generative histories more philosophically visible. Human relation under these conditions can therefore be understood through the capacity to enter shared histories with others whose trajectories retain meaningful independence, to sustain commitments through time, to encounter contingency, and to participate jointly in the conditions of a common world.

The manuscript closes with this relational orientation. A future in which artificial systems provide an expanding range of human functions would change the practical reasons for needing particular others. The deeper philosophical question concerns the forms of coexistence that subjects continue to create once many of those practical necessities recede. The framework developed here locates one answer in generative coexistence: relations among differentiated agents whose histories remain capable of affecting one another, whose commitments can be chosen and revised, and whose common world remains an object of shared generation and governance.