Toward a Relational Account of Attachment Continuity and Change

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Abstract

Attachment is widely recognised as relationship-specific, yet developmental continuity is often described as though security were an enduring child characteristic. This theoretical article asks how attachment relationships acquire reliable ways of relating that show continuity while remaining open to change. Drawing on attachment theory, transactional development, ecological psychology, learning theory, and canalisation, it proposes a relational account centred on recurrent child - caregiver episodes of disruption, recruitment, response, uptake, repair, and renewed engagement. Through co-construction, these interactions alter what the child – caregiver relationship comes to afford, and canalisation describes how some relational pathways become increasingly reliable and available without becoming fixed. Published longitudinal findings are re-read as different histories of relational development rather than simply stable or changing child classifications. The account generates testable predictions for sequential and longitudinal research. Attachment continuity is proposed as continuity in historically co-constructed relational affordances that have become increasingly reliable through canalisation

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Keywords: attachment; canalisation; relational affordances; developmental continuity; caregiver sensitivity; relational development; secure base.

Introduction

Attachment as a developmental relationship

Contemporary theory has moved beyond considering attachment a trait residing within an individual child. In a recent state-of-the-art review, Opie et al. (2026) are clear: attachment is a component of a relationship, arising in the child's tendency, particularly under conditions of distress, to seek proximity, care and protection from a particular stronger and wiser other. The perspective is consistent with a wider developmental movement acknowledging relational systems, as Dykhuis et al (2024), have argued, developmental explanation increasingly requires attention to the dynamics of person–context relations rather than the treatment of individual and context as separable sources of influence.

Relational specificity may now be considered fundamental to the construct. It would be very difficult to reconcile any simple account of security as a general attribute of the child with the extant evidence. Pinquart's (2022) meta-analysis found only a modest association between the relationships of mothers and fathers. Whatever common influences may operate across caregivers, we therefore know that any adequate treatment of the subject must give attention to the developmental history of each child - caregiver relationship. The question is therefore no longer simply whether a child is secure, but how security comes to be organised, maintained or altered in relation to the caregiver.

Once the relational premise is accepted, a further developmental question becomes unavoidable. Relationships develop through discrete interactions, but attachment is realised through enduring

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ways of relating that show continuity over time. The way a particular attachment relationship is lived may also change. The theoretical problem is therefore not simply whether attachment is stable. It is how, through recurrent co-construction, a relationship acquires a sufficiently reliable way of relating and show continuity while remaining open to change. McIntosh et al. (2024) reported observational assessments of attachment and caregiving from infancy at one year to the preschool period at four years in the Australian Temperament Project Generation 3 cohort. Security showed substantial continuity, particularly among dyads classified secure in infancy, yet change was also common. Movement was predominantly toward security, while a minority of dyads that were classified as 'disorganised' in infancy remained disorganised at the preschool assessment. Loss of secure attachment to the mother was also associated with decreased maternal caregiving sensitivity across the period, whereas acquisition of security was associated with increased maternal sensitivity.

The evidence exposes a limitation in the terms of analysis: Caregiving sensitivity or responsiveness can be measured in the caregiver, while attachment organisation is commonly classified from the child's behaviour in relation to that caregiver. The association between them is important, but it does not by itself explain how a relationship develops. Campi, Nye, and Baranek's (2025) theoretical model of parent responsiveness is especially useful here. Their systematic review synthesis demonstrates how conceptually complex responsiveness becomes once its forms, contingencies and contexts are examined closely. Yet even a refined construct of caregiver responsiveness is not equivalent to the relationship that develops through recurrent child–caregiver transactions. A change in one variable associated with a change in another therefore leaves open the micro-developmental process through which child and caregiver repeatedly alter one another's subsequent possibilities for action.

De Wolff and van IJzendoorn's (1997) meta-analysis concluded that sensitivity was an important but insufficient antecedent of attachment security and argued for greater attention to contextual and transactional processes. The persistence of this problem is theoretically significant. The empirical literature has become increasingly sophisticated in describing sensitivity, responsiveness, attachment classification and their associations, but such descriptions of covariation have yet to provide any explanation of how the relationship itself acquires developmental continuity. What occurs between one assessment and the next? What is being reproduced when an attachment relationship remains secure, and what is progressively reorganised when security is acquired or lost?

The proposal developed in this paper is that these questions can be approached by treating attachment continuity as continuity in a historically co-constructed relational pathway. In a recent relational account of stress and flow (Siraj-Blatchford, 2026) we have argued that recurrent histories of disruption, recruitment, assistance, repair and renewed participation can become canalised: some ways of proceeding become increasingly available through repeated enactment without becoming mechanically fixed. Here we explore the attachment implications further by asking what happens when a attachment figure becomes a recurrent part of the pathway through uncertainty and distress.

Gibson's (1979) ecological concept of affordance provides a language for relationship-specific possibilities: through accumulated interaction, an attachment figure may come to afford proximity, protection, comfort, assistance, recovery and renewed exploration for this child. Canalisation adds the temporal dimension. Borrowed from Waddington (1942, 1957) and extended in Siraj-Blatchford (2026), canalisation describes the increasing robustness and renewed availability of developmental pathways through recurrent participation without treating repetition as a separate causal force. Across attachment episodes, caregiver response alters what becomes possible, the child takes up, rejects or modifies that opening, and subsequent encounters occur within the history thereby created.

The central proposition of this paper is that attachment continuity may be understood as the canalisation of relational affordances through recurrent child–caregiver transactions. This is not proposed as a replacement classification of attachment, nor does it deny the relevance of biological processes, internal working models, expectations or learning. It concerns the explanatory relationship among them. What is subsequently represented, expected or physiologically prepared has developed within repeated transactions in which a particular child, and particular other have found, or have failed to find, ways through disruption toward security and renewed engagement.

The following sections move from continuity, specificity and plasticity to transactional co-construction, relational affordances and the micro-developmental pathway, before using canalisation to explain how recurrent episodes acquire history. The final sections return to longitudinal evidence and specify empirical tests of the account.

From sensitivity to relational transactions

Attachment theory has never been indifferent to the quality of caregiving. Ainsworth's observational work made maternal sensitivity central to understanding individual differences in attachment. Her account was already more relational than a simple parent-effects model: sensitivity concerned the caregiver's capacity to notice the infant's signals, interpret them appropriately, and respond promptly and suitably within ongoing interaction (Ainsworth et al., 1978). The secure-base phenomenon likewise linked proximity and exploration dynamically. The child's ability to explore was not independent of the caregiver relationship; it was partly constructed through confidence in the caregiver's availability under conditions of threat or uncertainty.

The subsequent literature has repeatedly confirmed the importance of sensitive and responsive care, while also showing that it is not sufficient in explaning attachment security. De Wolff and van IJzendoorn's (1997) meta-analysis was important in this respect. Sensitivity was a significant antecedent of security, but the association was not strong enough to justify treating sensitivity as the single causal key to attachment. Their analysis encouraged greater attention to contextual and transactional processes. More recently, Campi, Nye, and Baranek (2025) reviewed 463 studies and demonstrated how heterogeneous the construct of parent responsiveness itself has become. Their theoretical model identified 15 dimensions across four levels of responsive behaviour, including forms of response, timing, proximity and contingency. This is a substantial conceptual advance, but it also makes a further distinction necessary: even a richly specified account of caregiver responsiveness is still not the same thing as an account of the developing relationship.

The distinction matters because attachment is produced through sequences in which both participants are active. A child signal does not have a developmental consequence independently of what follows, and a caregiver response does not have a fixed meaning independently of how the child takes it up. An approach may be welcomed, ignored or resisted; comfort may settle distress or intensify it; a pause may provide space or be experienced as unavailability; the same physical act may have different significance within different relational histories. The relevant developmental process therefore lies neither in caregiver behaviour alone nor in child behaviour alone, but in their recursively constructive transactions.

Sameroff's (2009) transactional model provides the broader framework: child and caregiver alter one another across continuing exchanges rather than contributing separable effects (Sameroff, 2009). This is necessary but still too broad to specify the recurrent co-constructions through which attachment continuity develops. Bosmans et al. (2020) help open this 'black box' by showing how contingencies among support seeking, caregiver availability, expectation, attention and subsequent behaviour can generate stability and change. This is a major advance because it makes attachment

development experimentally tractable. If a child repeatedly has the experience that support seeking predicts caregiver availability and relief, expectations about availability can be learned; if support seeking is inconsistently or negatively followed, different expectations and behavioural strategies may become established. The account also offers mechanisms through which existing attachment patterns can be updated when contingencies change. In this respect, learning theory provides precisely the kind of temporal mechanism that purely classificatory accounts lack.

The present argument builds from, rather than against, this account. Its proposed extension concerns the unit in which learning is located. What is learned by the child arises from a recurrent construction that is first enacted between child and caregiver. A developing expectation that a caregiver will be available is one consequence of that history, but it is not identical to the relational pathway that produced it. Similarly, changes in attention, neurocognitive preparedness or support-seeking behaviour are consequences and components of repeated transactions, but none alone constitutes the attachment relationship.

A simple sequence illustrates the distinction. The child encounters uncertainty, signals or moves toward the caregiver, the caregiver responds, the child responds to that response, and the activity either settles, escalates, redirects or returns toward exploration. Each component can be measured separately, but the developmental event lies in the co-construction of the sequence. A highly responsive caregiver response that the child cannot use does not have the same relational consequence as one that is taken up and supports recovery. Conversely, a relatively small or delayed response may be sufficient in a relationship where the child already treats that person as reliably available. Historical meaning therefore modifies immediate contingency. This point also helps reconcile learning theory with relationship specificity. The same caregiver behaviour need not have the same effect with every child because its significance is partly constituted by the history of that particular relationship. Likewise, the same child behaviour need not elicit or mean the same thing with different caregivers. Contingencies are therefore relationally situated rather than abstract stimulus–response pairings. Learning occurs within a field already constructed by prior transactions, and new experience updates that field to different degrees depending on what has previously become reliable. From this perspective, sensitivity can be repositioned rather than displaced. Sensitive responsiveness is one important way in which the caregiver alters the child's available routes through uncertainty, but its developmental effect depends on the larger transaction in which it occurs. The relevant sequence is not simply caregiver sensitivity *to* child security. It may be closer to: child orientation or bid *to* caregiver perception and response *to* child uptake *to* recovery, escalation or withdrawal *to* renewed exploration or continued disruption *to* subsequent encounter within the history thereby created. This formulation preserves the empirical importance of sensitivity while locating it inside the relationship that sensitivity helps to construct.

The next step is to specify what such relational co-construction makes possible. Attachment figures are not interchangeable sources of generic support. Through accumulated transactions, a particular person comes to afford particular possibilities for this child: proximity, comfort, protection, assistance, recovery and renewed exploration. Affordance theory provides a language for these relationship-specific possibilities without locating them wholly in either caregiver or child. It is therefore the bridge from transactional description to the micro-developmental account developed in the following pages.

Relational affordances and the active child

The transactional account developed above still leaves one question open: what, in practical developmental terms, does a particular attachment figure come to make possible? The language of caregiver sensitivity describes important features of adult conduct, and learning theory explains how

repeated contingencies may alter expectation and behaviour. Neither formulation, however, fully captures the relational fact that the same adult may come to mean and enable different things for different children, while different adults may make different possibilities available to the same child. Ecological psychology provides a useful language for this relationship-specific field of possibility. Gibson (1979) introduced the concept of affordance to describe possibilities for action that exist in relation between an organism and its environment. An affordance is therefore not simply an objective property waiting in the world, nor an internal representation projected onto it. A surface may afford sitting for one body but not another; an object may afford grasping only for an organism with the relevant bodily capacities. The concept was developed for organism–environment relations rather than attachment, but its relational logic is directly useful here. A person can likewise become part of what a situation affords: someone to approach, avoid, call, follow, lean toward, recruit, hide behind, return to, or move away from.

Attachment makes these social possibilities unusually specific. A caregiver does not afford proximity, comfort or recovery merely by occupying the social category ‘parent’. Nor does the child respond only to a fixed set of caregiver properties. What this person affords for this child depends partly upon their history together. Through recurrent interaction, one caregiver may become a particularly reliable route to proximity, protection, soothing, assistance and renewed exploration, while another may afford some of these possibilities less reliably or in different circumstances. Relationship specificity is therefore not only a difference in what the child expects from different people; it is a difference in the field of possibilities that has developed between this child and these particular others. This formulation places the child back at the centre of attachment development without returning to an individualist account. Bowlby’s (1982) theory already treated the infant as an active participant whose attachment behaviour is organised toward maintaining or restoring proximity under changing conditions. The child orients, signals, vocalises, reaches, follows, approaches, clings, withdraws, watches, waits, returns and resumes exploration. Such actions are not simply read-outs of an attachment classification already formed. They are operations through which the relationship is repeatedly enacted and potentially modified. The distinction matters because an affordance must be taken up. The caregiver may offer contact, a gesture, a vocal response or physical availability, but the developmental consequence depends partly on what the child does with that opening. The child may move toward the caregiver, remain distant, intensify signalling, settle into contact, turn away, continue to monitor, or use the caregiver’s availability as a basis for returning to exploration. Similarly, the caregiver responds not to an abstract signal but to this child’s particular mode of orientation and action, shaped by prior encounters. Each participant therefore alters what becomes possible for the other.

Embodiment is important here. Attachment has always concerned bodily proximity, touch, orientation and movement as well as expectation or representation. The relational affordance perspective keeps those dimensions within the explanatory field rather than treating them as peripheral expressions of an underlying state. A familiar body can afford holding, leaning, following, being carried, hiding against, or using another person as a point of orientation in space. Tone of voice, posture, gaze, movement and timing may change what the child can do next before any explicit interpretation is verbally available. The relationship is enacted through bodies as well as through cognition.

For attachment theory, the important developmental claim is therefore not that caregivers possess affordances in themselves, but that recurrent interaction can make particular relational possibilities increasingly available. A child who has repeatedly found that orienting toward a caregiver leads to an intelligible and usable response may encounter later uncertainty within a field already structured by that history. The caregiver’s mere presence may then alter what the situation affords before any

active intervention occurs. Conversely, where prior approaches have been inconsistently answered, frightening, intrusive or unavailable, the presence of the same person may provide a quite different field of possibilities. This account preserves a role for internal working models and learned expectancies while changing their explanatory status. Expectations may help the child anticipate what a caregiver will do; attention may become selectively organised toward cues of availability or rejection; physiological systems may prepare for familiar forms of interaction. These are important products and components of attachment development. The affordance claim is simply that they should not be mistaken for the relationship itself. What the child expects has been formed within recurrent transactions, and what the caregiver affords in the present depends upon the historically co-constructed relationship in which both participate. The active child and relational affordance therefore belong together: attachment develops as the child acts into a social world that answers back. The next section examines that process at episode scale.

The micro-developmental pathway

A relationship develops across months and years, but it is only ever enacted in particular moments. If attachment continuity is to be explained developmentally rather than inferred from classifications at separated time points, the analysis needs a unit small enough to show how one encounter contributes to the next. The proposal here is to treat the attachment-relevant episode as a micro-developmental pathway: a bounded sequence in which the construction of the child–caregiver relation changes as activity is disrupted, a particular other is recruited, a response occurs, that response is taken up or not, and participation is subsequently repaired, redirected or abandoned.

The sequence should not be treated as a rigid stage model. Attachment-relevant activity is recursive and may begin at different points. A child may recruit a caregiver before distress becomes marked; a caregiver may anticipate a developing difficulty; response and uptake may unfold through several cycles; renewed exploration may be partial or delayed. Nevertheless, the sequence identifies processes that are often collapsed when attachment is described only as a child classification or a caregiver characteristic.

Bowlby's (1982) secure-base formulation connects protection with the capacity to engage the wider world. An attachment episode therefore begins within ongoing activity. The child is playing, exploring, moving, attending, interacting or resting within an environment already so-constructed by the presence or absence of familiar others. Disruption may arise from separation, novelty, physical discomfort, fear, failed action, social uncertainty, fatigue, or a change in the caregiver's availability. What makes the disruption attachment-relevant is not its category but whether it recruits the relationship as a possible route through what has changed.

Recruitment is an active process. The child may cry, call, look, reach, approach, follow, remain near, gesture, display an object, or use subtler forms of orientation. These actions need not all be consciously intended requests for support. Their developmental significance lies in how they alter the relation and invite, test or presuppose a response. The caregiver, in turn, may approach, touch, speak, wait, reposition, protect, acknowledge, offer an object, alter the environment or simply remain visibly available. Such responses change the child's immediate field of affordances.

Response alone is not enough. The next analytical question is uptake. A caregiver's action becomes developmentally consequential through what follows in the child's activity. Does the child settle into contact, continue to signal, resist, become more distressed, shift attention, accept assistance, or return toward exploration? The same adult behaviour can have different effects in different relationships because the child's uptake is historically co-constructed. Attachment research has often measured caregiver behaviour and child outcome as separable variables; the micro-developmental pathway

places the transition between them at the centre.

Repair and recovery are used here in a broader sense than the disappearance of visible distress. A relational account of stress and flow has proposed that recovery is best understood as the restoration of a viable relation with the world: a route into activity becomes possible again, whether through another person, a changed action, a material alteration or a previously reliable pathway (Siraj-Blatchford, manuscript in preparation). This is particularly relevant to attachment. Comfort that produces temporary quiescence but leaves the child unable to resume engagement is not equivalent to a sequence in which the relationship supports renewed orientation toward the world. The secure-base and safe-haven functions can therefore be understood as temporally connected moments within one process.

Renewed exploration is not required after every attachment episode, especially in infancy, illness, fatigue or conditions of sustained threat. The more general criterion is renewed viability: the child can proceed in a way that was not available during the disruption. Sometimes this means returning to play; sometimes remaining in proximity; sometimes accepting care; sometimes reorganising activity around a changed situation. The point is to avoid defining successful attachment interaction solely by lowered arousal. Physiological settling may be part of recovery, but the developmental outcome concerns what the relationship now allows the child to do.

The formative episodes may be described in terms of scheme–schema–affordance formulation (SSAF) (Siraj-Blatchford, 2026). At the minimal level required here, a scheme may be considered a recurrent embodied pathway of acting; a schema the figurative aspect of that pathway and the realised availability of a relational possibility in the present encounter. The affordance is a possibility for action arising in the relation between child, the other and the environment (*op cit*). In an attachment episode, looking, approaching, reaching, waiting or withdrawing often function as schemes. Through their accumulated history together, an attachment figure may come to afford approach, proximity, protection, comfort, assistance, monitoring or withdrawal in different circumstances. When one of these relational possibilities becomes available and is taken up in the present encounter, it provides the figurative aspect of the pathway: This is not considered a stored representation of the caregiver, but a realised affordance within the developing relationship. The caregiver's present conduct may then sustain, alter or close down what the relationship affords next. The value of this micro-level account is that it does not require the analyst to decide in advance whether the causal explanation resides inside the child, inside the caregiver or in a contextual variable. The unit *IS* the co-constructed encounter. Bodily arousal, attention, expectation, memory, adult sensitivity, material arrangements and cultural practices can all matter, but they matter through the way they alter what happens next in the pathway. This allows internal working models and learning mechanisms to remain part of the explanation while locating their development within recurrent participation.

It also makes mismatch and repair theoretically important. No attachment relationship can depend upon perfectly fitted responses. Caregivers misread signals, children refuse offered comfort, external demands interrupt interaction, and circumstances change. A relationship may therefore become secure not because disruption is absent, but because recurrent disruptions can be navigated in ways that preserve or restore viable participation. Conversely, repeated failure of recruitment or repair may progressively alter what the child attempts, attends to or expects. The developmental information lies partly in how the dyad proceeds after the mismatch.

Observations should therefore code the complete sequence surrounding attachment-relevant events: preceding activity, disruption, recruitment, caregiver response, child uptake, repair or redirection,

and re-entry. A single episode can demonstrate co-construction but not canalisation; repeated observations are required to show increasing reliability, economy or resistance to perturbation across time.

Canalisation: how relationships acquire history

Canalisation provides the temporal concept needed to connect recurrent attachment episodes with continuity across development. As previously suggested, the term is borrowed and adapted from Waddington's embryological account of developmental canalisation, it was previously adapted in the context of cognitive development Siraj-Blatchford, 2026), and is here similarly adapted to identify the renewed availability of an attachment pathway. The co-construction is carried out through recurrent child - caregiver transactions, where the child or the attachment figure is recruiting, the other responding, and the child taking up, modifying or rejecting what that response makes possible, with the encounter proceeding toward escalation, recovery, withdrawal or renewed engagement. One encounter does not constitute attachment. If a child repeatedly recruits an attachment figure in moments of uncertainty, if that person's responses become sufficiently intelligible and usable, and if those encounters repeatedly reopen possibilities for protection, comfort, assistance or renewed engagement, later encounters no longer begin from zero. The child's orientation, bodily preparedness, timing and expectations have been altered by previous participation; the caregiver's recognition, timing and response have also been altered; and the relation between them has acquired a history. The pathway is co-constructed because neither participant simply supplies a fixed input to the other. Each recurrent encounter is shaped by what both participants bring from earlier encounters and by what the present situation affords.

Of course an attachment figure is not developmentally significant simply because they occupy the social category of parent or caregiver. 'Significance' is acquired through a history in which that person's presence, availability and anticipated response increasingly alter what the situation affords for this child. Through recurrent transactions, the attachment figure may come to afford approach, proximity, protection, comfort, assistance, monitoring, waiting, retreat, or renewed exploration. Those possibilities are relational: another person does not afford the same possibilities to every child, and the same child does not encounter identical possibilities with every attachment figure.

The pathway metaphor does not imply repetition of an identical behavioural sequence. Crying may become calling, looking, waiting, verbal requesting or simply checking that the attachment figure remains accessible; caregiver intervention may likewise become less overt. What can remain continuous is the acquired reliability of the relationship: recruitment opens usable possibilities that the child can increasingly take up in ways that permit recovery or renewed engagement. The canalised history is apparent in the form and affordances of the relationship, where particular possibilities become increasingly recognisable, usable and dependable: It's not an abstract structure stored in either participant. This helps clarify attachment security in process terms. Security need not be treated as a substance or capacity possessed by the child. It may instead describe the reliability and viability of a relationship as a route through uncertainty: the extent to which the child can recruit the attachment figure and, through the unfolding transaction, regain access to protection, assistance, comfort, recovery and renewed engagement. This does not replace established attachment classifications. It proposes a developmental interpretation of what continuity in those classifications may represent.

The corresponding account of insecurity must remain equally processual and non-reifying. It would be an error to assign each insecure classification a single fixed pathway. Different histories can produce superficially similar behaviour, and the same relationship may afford different possibilities under different circumstances. The more modest proposition is that recurrent encounters in which

recruitment is unavailable, difficult to interpret, inconsistently answered, intrusive, frightening or hard to repair may progressively narrow or complicate what the relationship affords. What later appears as avoidance, resistance, heightened monitoring or disorganisation may therefore be understood as a historically developed way of relating, rather than only as the expression of an internal attachment state.

Canalisation also provides a way of understanding attachment inertia. Once a relational pathway has become dependable, a single contrary episode need not redirect it. An attachment figure who is briefly unavailable within an otherwise reliable history may continue to afford security; a newly sensitive response within a long history of poorly resolved interaction may not immediately become usable by the child. Previous encounters condition the meaning and uptake of present events. Change therefore often requires recurrent changed experience rather than isolated contradiction. This prediction is closely aligned with the learning account of Bosmans et al. (2020), but the emphasis is different. Learning theory describes how altered contingencies can update expectations and attachment-related behaviour. Canalisation places such learning within the broader history of a co-constructed pathway. It predicts path dependence: the same objectively coded caregiver response may open different possibilities, and may be taken up differently, in relationships with different histories. Expectancy is therefore one consequence of relational history, not the relationship itself. The same reasoning explains how continuity and plasticity can coexist. Prior activity changes the conditions of later activity, creating inertia without immutability. A relationship can be redirected when changed transactions become sufficiently recurrent and usable to alter what each participant anticipates and does. Increased caregiver sensitivity, a reduction in frightening behaviour, successful repair after previously unresolved mismatch, developmental change in the child, altered family conditions or support from wider relationships may all contribute. Plasticity is not the absence of history; it is change accomplished through history. Stable security, acquired security, lost security and continuing insecurity can be read as different histories in the availability and reliability of relational possibilities, rather than simply as four child trajectories. McIntosh et al's. (2024) reported association between changes in maternal sensitivity and changes in security is consistent with such an interpretation, although the published study does not directly demonstrate the intervening pathways. The canalisation account therefore makes an empirical demand: to understand why a classification remains stable or changes, developmental research must examine repeated relational sequences occurring between assessments.

Rutter's (1995) problem can now be reformulated. A dyadic quality need not literally transform into an individual characteristic. Instead, the relationship acquires a history, and both participants are changed through participating in that history. The child carries forward altered expectations, attention, bodily preparedness and schemes; the caregiver carries forward altered expectations, recognitions and responses; and their history changes what they can subsequently afford one another. Durable consequences may therefore appear in the individual without requiring attachment itself to migrate from dyad to child. This also helps explain apparent independence. As a pathway becomes more deeply canalised, less overt action by the attachment figure may be required. The child may recruit the relationship through a glance, a brief check, remembered availability or the expectation that assistance can be obtained if needed. The significant other may remain developmentally consequential even when not actively intervening. What looks like self-regulation may partly reflect a relational history that has become sufficiently dependable to be reconstituted with minimal immediate support. The developmental achievement is real, but its history is not erased by the increasing economy of the interaction.

The concept should not imply that all attachment continuity is produced in the same way. Biological development, temperament, health, broader family processes, culture and material circumstances

contribute to every relational history. Canalisation is useful precisely because these influences can enter the pathway without assigning developmental causation to one level in advance. A biologically influenced difference in reactivity may alter the disruptions a child encounters and the support required; recurrent caregiver responses may in turn alter how that reactivity is expressed. Trait-like stability may therefore describe the relative stability of a developmental pathway without, by itself, identifying its cause.

The conceptual claim is that attachment continuity may be understood as continuity in historically co-constructed relational affordances that have become increasingly reliable through canalisation. Attachment change involves the redirection of that pathway as subsequent experience changes what child and significant other can reliably make possible together.

What, then, is attachment?

The argument so far has deliberately avoided proposing a new definition of attachment. Its purpose is explanatory: to ask how a relationship that is recognised as relationship-specific can show continuity without being converted into an individual trait. The preceding analysis now permits a more explicit statement of what is being located where. Attachment, attachment behaviour, relational affordances, figurative schemas, internal working models and security are closely related, but they need not be treated as different names for the same phenomenon. A provisional definition follows from the argument:

Attachment is a historically developed form of relationship between a child and an attachment figure who has become a significant other, co-constructed through recurrent transactions in which possibilities for proximity, protection, comfort, assistance, recovery and renewed engagement become increasingly available and reliable.

Child and attachment figure continually alter what is possible for one another, even though their roles, responsibilities and power are not symmetrical. ‘Significant other’ names an achievement of this history rather than merely a social role: the person becomes consequential for what the child can recruit, anticipate and do.

Attachment can first be distinguished from attachment behaviour. Crying, approaching, following, clinging, looking, checking, waiting, withdrawing or returning are behaviours or schemes through which the relationship may be enacted in particular circumstances. No one behaviour is attachment itself. The same observable act can have different significance in different relationships, while the same attachment relationship can be enacted through different schemes as the child develops. Attachment behaviour is therefore episode-scale action in relation to an attachment figure; attachment is the historically developed way of relating within which those acts acquire their significance. The distinction between figurative schema and internal working model is especially important. In the SSAF formulation, a figurative schema is not a stored representation of the attachment figure. It is the figurative aspect of a currently enacted pathway: a relational possibility realised as presently available within a historically formed way of proceeding (Siraj-Blatchford, 2026). If the child looks toward the attachment figure and that person is encountered as reachable, recruitable or safe to approach, this realised availability is schematic in the specific sense used here. The schema belongs to the episode-scale formation in which scheme and affordance are jointly recruited; it should not be treated as a concealed object inside the child.

Bowlby’s (1982) internal working model remains a different construct. It was introduced to explain how relational experience can inform expectation beyond the immediate encounter, including when the attachment figure is absent. Expectations about availability, attention to signs of rejection or

safety, anticipations of comfort, and remembered possibilities for recruiting help may all carry forward relational history. The present account does not require those consequences to be denied. It proposes instead that an internal working model is one individual consequence of recurrent relational participation, whereas an SSAF schema refers to the figurative availability realised within an ongoing child–other–environment relation. Treating the two as synonyms would collapse the distinction that the ecological reconstruction is intended to preserve.

Security can likewise be located more precisely. In conventional research, security is a classification derived from patterns of behaviour in relation to an attachment figure. The present account interprets that pattern developmentally as the reliability and viability of the relationship as a route through uncertainty. A secure relationship is one in which the accumulated history makes the attachment figure sufficiently recruitable, and the possibilities opened through that relationship sufficiently usable, that protection, assistance, recovery and renewed engagement remain dependably available. Security therefore concerns the reliability of a way of relating, not a separate internal capacity that causes the relationship to work. This process interpretation should not be mistaken for the claim that secure relationships are always smooth, calm or immediately successful. Secure relationships contain mismatch, distress, delay and imperfect response. Their developmental significance may lie partly in the availability of repair. What becomes reliable is not uninterrupted harmony but a workable route through disruption. Safe-haven and secure-base functions are therefore temporally connected: recruitment of the significant other matters developmentally because it can reopen possibilities for engaging the wider world. Likewise, insecure classifications should not be treated as unique pathways: similar classifications may arise from different relational histories and related histories may be expressed differently under changed conditions.

The conceptual map can therefore be stated more carefully as follows:

Table 1
Conceptual Map of Attachment Constructs

Term	Proposed analytic location
Attachment	The historically developed, co-constructed way of relating between child and attachment figure/significant other.
Attachment behaviour	Schemes enacted in episodes: orienting, signalling, approaching, checking, waiting, withdrawing, returning and related actions.
Relational affordance	What the present child–significant-other–environment relation makes possible: proximity, protection, comfort, assistance, monitoring, recovery, shared attention and renewed engagement.
Figurative schema (SSAF)	The realised availability of a relational possibility within a currently enacted, historically formed pathway; not a stored representation of the caregiver.
Internal working model	An attachment-theoretical construct for individual expectations and anticipations through which relational history may influence activity beyond the immediate encounter.
Security	The reliability and viability of the relationship as a route through uncertainty toward protection, recovery and renewed engagement.

The table is intended to prevent explanatory slippage rather than to divide dynamically coupled processes into compartments. Attachment remains relational even though participation in an attachment relationship leaves consequences in the child, including altered expectations, attention, bodily preparedness and schemes of action. Continuity therefore need not imply persistence of a fixed behaviour, representation or child characteristic. It concerns the continuing availability of historically co-constructed relational affordances; change concerns alteration in what the relationship

affords, how those possibilities are taken up, and how reliably they can be recruited. This interpretation can now be returned to the longitudinal evidence that motivated the argument.

Returning to the longitudinal evidence

McIntosh et al. (2024) observed attachment classification and caregiving sensitivity from infancy at one year to the preschool period at four years in a population-based Australian cohort. Their study provides evidence of continuity, change and covariation between changes in attachment classification and caregiving sensitivity. It was not designed to observe the micro-developmental pathways proposed here. The purpose is therefore not to reanalyse their data, but to ask what their published findings look like when continuity is treated as a developmental problem rather than an endpoint.

At the population level, the proportion of dyads classified secure increased from 59% in infancy to 71% at preschool assessment. Among dyads with repeated attachment data, 80% of those classified secure in infancy were again classified secure at preschool age. Yet change was substantial: 20% of initially secure dyads moved to an insecure classification, while more than half of those initially classified insecure moved to security. At the four-way level, movement toward security occurred from avoidant, resistant and disorganised classifications. The findings therefore present continuity and plasticity simultaneously (McIntosh et al., 2024).

These classifications identify where a dyad was classified at two observation points separated by approximately three years of ordinary child–caregiver life; they do not show what happened within the relationship that proceeded between these points. As McLean and Riggs (2022) argue more generally, demonstrating differences across ages is not the same as explaining development. The missing object here is the history of transactions connecting the observations; showing how recruitment, response, realised affordance, uptake, repair and renewed engagement changed across recurrent encounters.

Stable security illustrates the problem clearly. McIntosh et al. report continuity in caregiving sensitivity, which was highest at both ages among stable-secure dyads. From the present perspective, stable security can therefore be treated as a hypothesis about the continuing reliability of a relationship rather than the persistence of an unchanged property within the child. Across the intervening years, recurrent encounters may have continued to make the attachment figure recruitable through increasingly economical schemes and repeatedly reopened possibilities for protection, comfort, recovery and renewed engagement. This interpretation is consistent with the findings, but it is not demonstrated by them. Repeated observations of the intervening encounters would be required to show canalisation.

Acquired and lost security provide complementary tests of the same account. Acquisition of security was associated with increased maternal sensitivity, while loss of security was associated with decreased sensitivity. A variable-based account can describe those covariations. A pathway account asks how changed caregiving became usable, or ceased to be usable, within the relationship. Movement toward security should involve responses increasingly opening possibilities that the child can take up, repair becoming more dependable, and the attachment figure increasingly affording a route back toward viable engagement. Movement away from security should involve previously dependable possibilities becoming less available or requiring more intensive recruitment. Because established pathways have history, isolated contrary encounters need not redirect them: recurrent changed experience is required before another way of relating becomes sufficiently dependable. This is the combination of inertia and plasticity that canalisation is intended to describe.

The continuously insecure and disorganised findings add an important caution. Stable classification need not imply a uniform developmental history. Dyads classified insecure at both ages may have travelled quite different routes between assessments, and McIntosh et al. found both continuity of disorganisation in a minority and substantial movement toward organised and secure classifications. Classification therefore cannot by itself reveal the relational process that produced continuity or change. Similar endpoints may conceal heterogeneous histories. This re-reading also clarifies the role of caregiving sensitivity. Sensitivity remains a property of caregiver behaviour as coded by an observer. It does not by itself measure child uptake, successful repair, the meaning of a response within the dyadic history, or whether the child can use the attachment figure to regain a viable route into activity. Two caregivers with similarly coded sensitivity may therefore participate in different affordance fields because their histories with the child differ. The theoretical move is not away from sensitivity but from sensitivity as a sufficient explanatory variable toward sensitivity as one contribution to recurrent co-construction. McIntosh et al. consequently provide an empirical provocation rather than a direct test of canalisation. Stable security, acquired security, lost security and continuing insecurity can be treated as possible outcomes of histories in which relational affordances have been maintained, widened, narrowed or redirected. The stronger empirical question is whether those histories can be observed across repeated episodes. Longitudinal research would need to connect episode-level disruption, recruitment, response, affordance, uptake and repair with history-level changes in the reliability and economy of the resulting pathway. The next section specifies the observations that would support or weaken this account.

Towards a research programme

A relational-canalisation account is useful only if it generates observations that go beyond the general claim that relationships matter. Relational Developmental Systems approaches already establish the importance of dynamic individual–context relations, while attachment research recognises relationship specificity and the developmental significance of caregiving. Dykhuis et al. (2024) make the corresponding methodological point that relational metatheory requires methods capable of representing dynamics rather than reducing development to parallel person and context variables. The present proposal should therefore be judged by whether its claims about relational affordances, uptake, repair, historical dependence and canalisation can be distinguished from simpler accounts based on current caregiver behaviour, current child characteristics or repeated attachment classifications.

The central distinction concerns timescale. An attachment-relevant episode can show disruption, recruitment, caregiver response, a changed field of affordances, child uptake, repair and renewed or redirected engagement. It cannot by itself demonstrate canalisation. Canalisation is a history-level claim: recurrent episodes have progressively altered how readily some relational possibilities become available and usable, and how robust the pathway is under changing circumstances. Affordance must also be operationalised relationally rather than coded as a property of the caregiver's act. Evidence lies in the relation between what a response makes possible and what the child can subsequently take up.

Empirical predictions

H1. Relationship specificity. If attachment continuity is carried by a historically developed way of relating, differences in a child's attachment to different caregivers should correspond to different histories in what those relationships afford. Repeated observations should show relationship-specific differences in recruitment, caregiver response, child uptake, repair and return, even after relevant child-level characteristics are taken into account.

H2. Sequential reliability and repair. Security should be related not only to the frequency of sensitive caregiver responses but to the reliability of complete relational sequences: child bid or orientation → caregiver response → relational possibility opened or altered → child uptake → repair/recovery → renewed or redirected engagement. A fitted response that the child can use is theoretically different from an equivalently sensitive response that is not taken up.

H3. Changes in relational affordances should precede or accompany classification change. In relationships moving toward greater security, caregiver responses should increasingly open possibilities that the child can use, repair should become more dependable, and renewed engagement more readily achieved. In relationships moving away from security, previously dependable possibilities should become less available or require more intensive recruitment. The account would be weakened if classification changed while repeated relational sequences showed no corresponding alteration in affordance and uptake.

H4. Historical dependence. The same caregiver action should not be assumed to have the same developmental effect independent of relational history. A brief signal or glance may reopen participation within a long history of usable availability but initially offer little usable possibility where recruitment has repeatedly failed. Statistical models should therefore test interactions between current events and prior dyadic history.

H5. Canalisation and inertia. Established attachment pathways should display both robustness and plasticity. Short-term changes in caregiver behaviour should not necessarily produce immediate change, whereas sufficiently recurrent changed transactions should progressively alter what the relation affords and what the child can take up. Bosmans et al. (2020) provide a learning-theoretical basis for updating under changed contingencies; the additional canalisation claim is that such updating occurs within a relational history whose inertia and redirection can themselves be observed.

These predictions also specify conditions under which the account would lose explanatory value. The stronger canalisation claim would be weakened if relational history added little beyond concurrent caregiver sensitivity, child temperament or prior attachment classification; if complete sequences were no more informative than isolated caregiver responses; if changes in security were unrelated to preceding changes in affordance and uptake; or if current responses operated independently of prior dyadic history.

The first stage of research should provide a secondary analysis of existing longitudinal datasets. Repeated measures of attachment, caregiving and child characteristics can test whether change is better represented as dyadic transition than as independent parent and child change, and whether relationship-specific histories account for variance beyond stable participant characteristics. Such datasets cannot recover micro-developmental sequences that were never recorded, but they can establish temporal associations and relationship specificity.

The second stage would involve sequential recoding of existing observational recordings. Where video or sufficiently detailed observational material is retained, coding can move below global ratings to the proposed sequence: activity before disruption; child orientation or bid; caregiver response; possibilities opened; child uptake, rejection or modification; repair or escalation; and renewed engagement. Affordance should not be inferred from caregiver behaviour alone. Coding should link caregiver action with child uptake; for example, whether an offered hand is approached, a glance is sufficient for continuation, reassurance supports return, or proximity is monitored without being used. Repeated observations would permit estimation of transition probabilities and changes in the economy of the sequence. Naturalistic observation is particularly valuable because the proposed

processes are temporal and relational, although it should complement rather than replace structured attachment assessment. Volk and Abo-Zena (2022) emphasise ecological validity, while Wood et al. (2026) provide guidance for naturalistic video observation in diverse contexts. A strong design would connect repeated observations of ordinary interaction with established attachment classifications.

A third stage would involve prospective repeated-observation studies designed specifically around relational pathways. Everyday uncertainty, failed action, novelty, fatigue, separation and re-entry can reveal whether and how the attachment figure becomes recruited and what the relation then makes possible. The same dyads could be followed across conventional attachment assessments, linking episode-level transitions with pathway-level continuity and later classification. The analytic approach should preserve order, timing and conditional transition. Lag-sequential analysis, multilevel event-sequence models, state-transition approaches and intensive longitudinal methods could be used according to data structure. Cultural variation should be treated as theoretically informative: the surface forms of recruitment, proximity, touch, reassurance or independent exploration may differ, while the functional question remains whether a significant other reliably affords a viable route through uncertainty toward safety, recovery or renewed engagement. Physiological and child-level measures can likewise be located within the sequence rather than treated as competing explanations.

Finally, episode, pathway and canalisation should remain evidentially distinct. An isolated successful repair demonstrates only that repair occurred. A recurrent relation between recruitment, response, affordance and uptake supports a pathway-level claim. Canalisation requires stronger evidence: increasing reliability, efficiency or resistance to perturbation across time, together with evidence that recurrent changed experience can redirect what becomes available. If such histories predict little once conventional variables are included, canalisation adds little; if they systematically account for continuity, change and relationship specificity, they provide the proposed developmental link between episode-scale interaction and enduring attachment classifications.

Conclusion: relationships acquire history

Attachment theory now has strong grounds for beginning from the relationship rather than from an individual trait. Evidence for relationship specificity, continuity and change makes the remaining developmental problem clear: how does a relationship become dependable enough to show continuity while remaining open to change? Rutter (1995) identified the difficulty in asking how a dyadic quality becomes an individual characteristic. The account developed here proposes that no literal transformation from dyad to trait is required.

Ainsworth's work established the importance of caregiver sensitivity and the secure-base relation, while later evidence showed that sensitivity alone is insufficient (Ainsworth et al., 1978; De Wolff & van IJzendoorn, 1997). Transactional models locate development in reciprocal child–caregiver activity, and Bosmans et al. (2020) specify learning processes through which repeated contingencies alter expectations and behaviour. The present proposal extends these accounts by distinguishing three linked processes: learning helps explain how expectations change; affordance theory identifies what the child–attachment-figure relation makes possible in the present encounter; and canalisation explains how recurrent co-construction can make some of those relational possibilities increasingly dependable across time.

The micro-developmental pathway makes this process observable through transitions among engagement, disruption, recruitment, caregiver response, relational possibilities opened or closed, child uptake, repair or recovery, and renewed or redirected engagement. The child is active

throughout. In the SSAF formulation, schemes are recurrent ways of acting and figurative schema refers to a relational possibility realised as presently available within the enacted pathway, not to a stored representation of the caregiver. Internal working models remain distinct individual consequences through which relational history may inform expectation beyond the immediate encounter.

Canalisation supplies the temporal connection. Waddington's (1942, 1957) concept is used cautiously: his epigenetic landscape was an embryological model, not a theory of attachment. The transferable principle is that developmental pathways can acquire robustness while remaining open to perturbation and redirection (Siraj-Blatchford, 2026). Applied here, recurrent child–caregiver transactions can make a way of relating increasingly dependable without making it fixed. Through that history an attachment figure becomes a significant other because the person's presence and response reliably alter what situations afford.

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