

Symbolic Reception of a Chinese Railway Narrative without Communicative Deployment: Evidence from Egyptian Technical Personnel

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Abstract: *Research on host-country perception of Belt and Road Initiative infrastructure frequently conflates media discourse, public attitudes, and communicative action, inferring shifts in perception from documented shifts in discourse. Drawing on Peirce's distinction between the immediate object and the dynamic interpretant, this study separates three sequential steps in symbolic transfer, namely reception, evaluation, and deployment, and measures each among graduates of a talent cultivation program serving Egypt's 10th of Ramadan Light Rail Transit, one of the flagship projects of China-Egypt cooperation under the Belt and Road Initiative (N = 38). Reception converged strongly, with the median respondent giving identical answers across all reception items, while evaluation did not inherit that convergence, dividing along independent dimensions and shifting with elicitation mode. Deployment followed from neither step: the most strongly endorsed proposition was selected by 7.9% of respondents as the claim fellow citizens would receive most favourably, against 68.4% for technological and utilitarian claims. Endorsement therefore does not entail advocacy, revealing a discontinuity that existing soft power and presumption accounts leave unmodelled. The findings also call for a reconsideration of instruments constructed from media-derived categories, as they may capture the salience of an international rather than a locally grounded agenda. Current provision in vocational education programs supporting such projects, in turn, appears to cultivate symbolic endorsement without developing the capacity to re-encode it for external audiences, indicating a gap that could be addressed through curriculum design.*

Keywords: Belt and Road Initiative, Symbolic reception, Host-country perception, Vocational education and training, Egypt.

1. Introduction

Research on how host-country publics perceive Belt and Road Initiative (BRI) infrastructure has expanded considerably over the past decade, and its findings are commonly summarized as evidence of shifting perception. That summary conflates three things that are not the same. Media discourse about a project, the attitudes a population holds toward the country that built it, and what members of that population will say to one another about it are distinct phenomena, related but not interchangeable. Studies rarely measure more than one of them, and inferences across the three are correspondingly under-warranted.

The distribution of existing evidence follows from this. One body of work analyses media texts: corpus-based discourse analysis has traced a decade-long shift in Kenyan coverage from infrastructure and trade toward debt and governance transparency [1], and comparable framing analysis has examined Egyptian press coverage, finding China's economic image constructed positively while its political image was damaged by trade deficit and debt distress [2]. A second body measures national attitudes: sentiment tracking of elite global media documents a shift in tone since 2013 [3], survey-based work has examined how media use shapes stereotypes of Chinese nationals among Arab publics [4], and nationally representative polling records favourable views of China among 64% of Egyptian citizens [5]. A third measures direct use: a survey of users of six China-built transport projects

across Southeast Asia found that satisfaction with project quality was associated with improved impressions of China [6]. Mixed designs are rare, and where they exist they pair discourse with national attitudes rather than with project-level interpretation, as in Myanmar [7,8,9] and Latin America [10,11].

What none of this addresses is the interpretation of a named project by those who work inside it, and what they subsequently do with that interpretation. The gap is specific and has four components: a single identified infrastructure project rather than the initiative or the country in general; host-country personnel with sustained occupational contact rather than media audiences or one-time users; symbolic interpretation, meaning what the project is understood to represent, rather than favourability or satisfaction; and onward communication, meaning what those personnel convey to publics outside the workplace. This combination is unexamined, and it is consequential, because occupational insiders are precisely the actors that recommendations for people-to-people public diplomacy presuppose [2].

Peirce's account of the sign supplies the analytic instrument for separating these components [12]. Two distinctions carry the weight. The first is between the immediate object, meaning the object as represented within the sign, and the dynamic object, meaning the object as it exists independently. The second is between the interpretive potential a sign carries and the dynamic interpretant, meaning the effect actually

produced in a particular interpreter on a particular occasion. Discourse analysis observes the former of each pair; only audience measurement reaches the latter. The distinction matters here because a sign received in common need not produce common effects, and a sign that produces effects in one interpreter need not be re-encoded by that interpreter for anyone else.

Egypt's 10th of Ramadan Light Rail Transit provides the case. It is one of the flagship projects of China-Egypt cooperation under the BRI, connecting Greater Cairo with the New Administrative Capital, constructed by a Chinese consortium, and in passenger service since 2022. Railways are well suited to this inquiry, since a passenger line is used repeatedly by the population whose views are at stake and carries a dense load of symbolic meaning concerning modernization, technological capability, and the reordering of everyday movement. The line is served by an order-based talent cultivation program whose graduates work on the project and live in the communities that interpret it.

This study measures the three steps separately among those graduates:

RQ1 (Reception): How coherently is the project's symbolic content received among host-country technical personnel?

RQ2 (Evaluation): Do respondents' evaluations of the project converge to the same degree as their reception of it, and does the profile of concern differ according to whether it is elicited by closed-ended prompting or by open-ended recall?

RQ3 (Deployment): Do the propositions most strongly endorsed as representing the project coincide with those respondents perceive as most favourably received by fellow citizens?

2. Theoretical Framework

2.1 The Peircean Triad as Master Frame

This study takes Peirce's account of the sign as its organizing framework [12]. In that account, semiosis involves a sign vehicle, or representamen; an object, which the sign stands for; and an interpretant, the effect the sign produces in an interpreter. Two of Peirce's internal distinctions carry most of the analytic weight here.

The first distinguishes the immediate object, meaning the object as represented within the sign itself, from the dynamic object, meaning the object as it exists independently and constrains what the sign can truthfully represent. Coverage of Chinese infrastructure finance illustrates the distinction. Debt has become an increasingly prominent theme in host-country reporting, as a decade of Kenyan coverage attests [1], while entity-level examination of China's development-finance terms across Southeast Asia has found no evidence of a coordinated debt-trap strategy [13]. In Peircean terms, the debt narrative is the immediate object, the financing arrangements themselves are the dynamic object, and the distance between the two is what this distinction is designed to capture.

The second distinguishes the immediate interpretant, the interpretive potential a sign carries, from the dynamic interpretant, the effect actually produced in a particular interpreter on a particular occasion. Discourse analysis observes the former, since a text can be examined for the readings it makes available; only audience measurement reaches the latter. Much of the literature reviewed in Section 1 treats the two as interchangeable, inferring what audiences conclude from what texts afford.

The framework's central claim follows from these two distinctions. A representamen does not determine a dynamic interpretant, so reception of a sign and the effect that sign produces are separate quantities requiring separate measurement. Nor does either determine what an interpreter will subsequently convey to others, since addressing a further audience requires a judgment about that audience rather than about the sign. Section 2.4 develops this into a sequential model of three steps.

2.2 Four Operational Instruments

Four established bodies of communication theory are retained, but as operational instruments for specific segments of the semiotic process rather than as parallel explanatory frameworks.

Framing theory specifies how a representamen selectively renders certain attributes of an object salient, thereby constructing an immediate object [14]. Critical discourse analysis supplies the linguistic mechanisms through which this construction is accomplished [15]. Together they define what is to be coded at the level of the representamen and the immediate object it constructs.

Agenda-setting theory specifies the mechanism by which representamen salience may transfer to interpretant salience, at both the issue and the attribute level, and specifies the conditions under which that transfer can be said to fail [16].

Soft power theory supplies the sender's motive for investing in representamen production, generating the testable prediction that sustained investment should improve target attitudes [17]. Evidence from Latin America [10,11] and from Kazakhstan, where the "New Silk Road" narrative succeeded only among citizens whose prior identity beliefs already aligned with it [18], indicates that this prediction holds only conditionally.

Social License to Operate theory identifies a channel that bypasses the representamen entirely, in which a community's direct experience of a project's material conduct shapes its judgments independently of how that conduct is reported [19]. Evidence from Chinese corporate social responsibility practice in East Africa [20], from cross-regional hydropower fieldwork [21], and most directly from a survey of users of six China-built transport projects across Southeast Asia [6], supports this direct route from dynamic object to interpretant.

2.3 Occupational Position as an Untested Third Channel

The comparative literature reviewed in Section 1 measures

cognition through one of two channels: mediated exposure, as in the Myanmar surveys, or direct product use, as in the Southeast Asian user survey. A third channel is logically available but empirically unexamined: sustained occupational contact, in which host-country nationals are employed inside a project while residing within the communities that interpret it.

This position is theoretically distinctive because it is doubly located within the semiotic process. Such personnel are dynamic interpretants in their own right, having formed judgments about the project through daily work. They are also potential representamen producers, since what they tell their families and neighbours becomes a sign vehicle in local circulation. This dual role corresponds to what has been described in other domains as presumption, the collapse of the producer-consumer distinction [22]. The present study examines this channel directly.

2.4 A Three-Step Model of Symbolic Transfer

The distinctions above yield a sequential model of what must occur for a project narrative to reach an audience beyond the cohort that receives it. The model separates three steps that

perception research commonly treats as one, and specifies that each is conditional on, but not guaranteed by, the one preceding it.

Step 1, Reception. The sign is received. Host-country personnel attribute symbolic meaning to the project, converging on what it represents. In Peircean terms, the immediate object is transmitted intact and held in common.

Step 2, Evaluation. The object is evaluated. Recipients form judgments about the project along dimensions that are analytically independent of one another, including operational reliability, affordability, fiscal implications, and environmental consequence. Because the dynamic interpretant is the effect produced in a particular interpreter, evaluation need not converge even where reception has.

Step 3, Deployment. The received sign is re-encoded for an external audience. Recipients select which propositions to advance when addressing publics who do not share their occupational vantage point. This step requires a judgment about the receiving audience rather than about the project, and it is therefore not entailed by either preceding step.

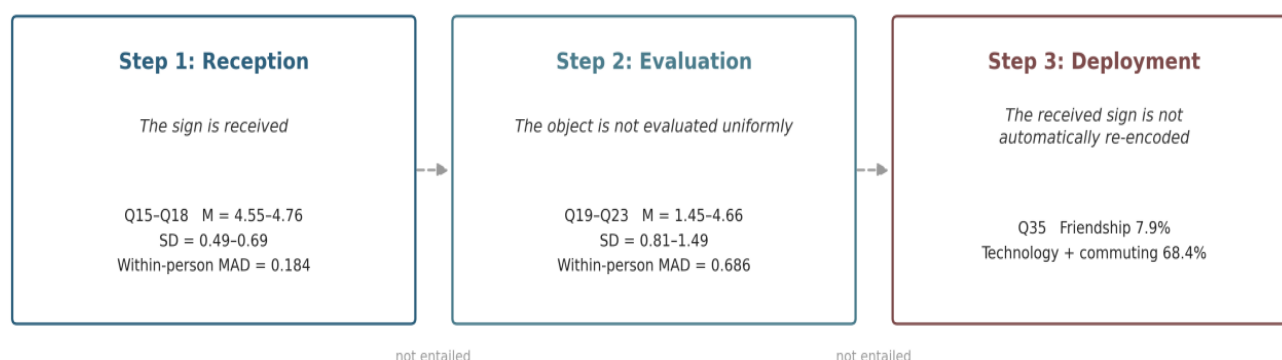


Figure 1: A three-step model of symbolic transfer, with results from the present study. Each step is conditional on, but not entailed by, the step preceding it.

Existing frameworks address these steps unevenly. Agenda-setting theory models the transfer of salience into an audience and thus concerns Step 1, and to some extent Step 2, without addressing what recipients subsequently do [16]. Soft power theory assumes that attraction converts into influence, which presupposes Steps 1 through 3 as a continuous sequence [17]. Social License to Operate theory concerns Step 2 specifically, holding that direct experience of a project's conduct shapes evaluative judgment [19]. The presumption literature describes actors who both receive and produce, but treats the transition between the two as unproblematic [22]. The present study measures the three steps separately and reports where the sequence holds and where it breaks.

3. Materials and Methods

3.1 Setting and Participants

This study utilized the order-based talent cultivation program of the LRT Project as the empirical research context. This program is conducted by the joint contractor and a Chinese vocational institute, and has supplied successive cohorts of Egyptian technical personnel to the project. The present

analysis is restricted to program graduates, that is, respondents who have crossed the occupational boundary into employment or post-graduation status.

The instrument was developed in Chinese, translated into Arabic by a bilingual translator with railway technical background, and back-translated by a second translator to verify equivalence of the symbolic attribution items, where wording differences would bear directly on the construct. It was pilot-tested with three program participants who are not included in the analysed sample, and two items were reworded following that test.

Administration was online through a survey platform, with the invitation distributed via WeChat in January 2026. Participation was voluntary and anonymous. No name, contact detail, or work unit was collected, and platform-level identifiers were not linked to responses. The invitation stated that the researcher holds no employment, contractual, or supervisory relationship with the contractor; that responses would be reported only in aggregate; that no individual response would be disclosed to any project entity; and that participation or non-participation would have no bearing on employment, appraisal, or career development. Respondents

could withdraw at any point before submission. The median completion time was 6.6 minutes (interquartile range 5.0 to 9.8 minutes). Of 109 eligible participants, 59 returned valid responses, a response rate of 54.1%. The present analysis is restricted to the 38 respondents who had completed the program. As a robustness check, all primary analyses were repeated on the subgroup currently employed on the railway project ($n = 34$); results were consistent in direction and close in magnitude, with the immediate object composite at 4.699 rather than 4.671, the friendship item mean at 4.82 rather than 4.76, and the proportion selecting the friendship frame at Q35 at 8.8% rather than 7.9%.

3.2 Instrument

The instrument comprises five parts. Part Two measures professional competence and cross-cultural capability. Part Three operationalizes the three steps of the model. Four items measure reception, capturing what the project is taken to represent, and were each drawn from a theme circulating in official communication about the project, so that the layer measures uptake of an existing symbolic repertoire rather than attitudes formulated by the researchers. Five items measure evaluation, each addressing one dimension along which the project may be judged; the dimensions were chosen to be analytically independent rather than to form a scale. Deployment is measured at Q35, a forced choice among five aspects of the project, which asks which one respondents perceive as most favourably received by fellow citizens. Its options derive from the same repertoire as the reception items, so both measures address a common set of propositions, and being a forced choice it yields a relative ranking rather than an absolute evaluation, a constraint addressed in Section 5.5. Table 1 sets out the correspondence.

Table 1: Operationalization of the three steps.

Step	Item	Construct addressed	Direction
Reception	Q15	Modernization and everyday life	Positive
Reception	Q16	Bilateral friendship	Positive
Reception	Q17	Speed and construction efficiency	Positive
Reception	Q18	Technological fit to local conditions	Positive
Evaluation	Q19	Confidence in long-term operational commitment	Positive
Evaluation	Q20	Fiscal implication for the host country	Reverse-scored
Evaluation	Q21	Affordability as perceived in the community	Positive
Evaluation	Q22	Environmental and community impact	Reverse-scored
Evaluation	Q23	Change in own attitude over time	Positive
Deployment	Q35	Proposition perceived as most favourably received	Forced choice

Part Four measures media environment and community mediation, including a narrative agency subscale. Part Five contains retrospectively anchored items on economic and cultural adaptation, together with open-ended items. All Likert items use a five-point agreement scale; Q20, Q22, and Q25 are reverse-scored.

3.3 Analytic Strategy

The comparative literature summarized in Section 1 was identified through a structured but non-systematic search, an approach appropriate to a body of work spanning discourse

analysis, survey research, and applied policy reporting [24].

Responses were exported from the survey platform and analysed in Python 3.12 using pandas and SciPy. No imputation was performed. Items routed exclusively to the graduate branch were answered by all 38 respondents in that branch, and no analysed item contained missing values. Q20 and Q22 were reverse-scored before any composite or dispersion computation, and both corrected and uncorrected values are reported where the distinction affects interpretation. Two-tailed tests are reported throughout, with α set at 0.05.

Reception coherence refers to the degree to which respondents converge in their attribution of symbolic meaning, operationalized through the dispersion of item responses rather than internal consistency alone. It is assessed here at three levels. At item level, dispersion is reported as standard deviations together with complete response distributions and top-two-box and bottom-two-box proportions. At scale level, internal consistency is reported for the immediate object layer. At individual level, a within-person mean absolute deviation is computed for each respondent as

$$D_i = \frac{1}{k} \sum_{j=1}^k |x_{ij} - \bar{x}_i|$$

where $\bar{x}_i$ is respondent i 's own mean across the k items of a given layer. This index measures whether a single respondent answers consistently across a set of meanings, independently of whether respondents agree with one another, and is computed separately over the four immediate object items and the five dynamic interpretant items. Because the dynamic interpretant items differ in valence, Q20 and Q22 were reverse-scored before computing D_i so that dispersion reflects divergence in evaluative position rather than item wording; the uncorrected value is also reported.

Immediate object layer items were combined into a composite following reliability assessment. Dynamic interpretant layer items are reported individually rather than as a composite, for reasons set out in Section 4.2. Retrospectively anchored items were tested against the scale midpoint using one-sample t tests, following the reasoning in Section 3.4.

Responses to the two open-ended items were analysed through categorization of brief open-ended responses rather than thematic analysis in the reflexive sense. This designation reflects the corpus: 68.4% of responses to Q34 and 57.9% of responses to Q36 consist of three words or fewer, with a median length of two words in both cases. A corpus of this form does not support the iterative code-to-theme development that thematic analysis denotes, and the procedure applied was accordingly the assignment of brief responses to a predefined category frame, permitting multiple categories per response.

Two coders worked independently. The second coder assigned categories without access to the first coder's assignments, using only the response texts and the category frame. Exact agreement on the complete category set was 37 of 38 responses (97.4%) for both items. Because the frame permits multiple categories per response, Cohen's κ was computed separately for each category as a binary presence indicator. For Q34, κ reached 1.000 for eight of nine categories, with a frequency-weighted mean of 0.976; the

ninth category, operational safety, returned a degenerate value because the first coder did not assign it and the second assigned it once, leaving no variance on one side. For Q36, category-level κ ranged from 0.907 to 1.000, with a frequency-weighted mean of 0.970. Given the brevity of the corpus, these coefficients should be read as evidence that the category frame was unambiguous rather than as evidence that coder judgment was extensively tested.

Both disagreements were adjudicated in favour of the second coder. In the first, the response explicitly named safe operation alongside service hours and fare, and the first coder had omitted the corresponding category. In the second, a substantially longer response affirming the importance of all technical specializations and calling for attention to each was adjudicated as a recommendation to strengthen technical content rather than as a statement that no strengthening was required. Adjudicating this second case in the opposite direction would shift two categories by one response each and would leave the distribution otherwise unchanged.

3.4. Design Decisions

Two features of the analytic design warrant explicit justification.

First, the analysis is restricted to program graduates. The construct of interest is how a flagship project is interpreted by host-country personnel who have crossed into the workplace and can speak to it from sustained occupational experience, which is the position identified in Section 2.3 as the untested third channel. Restricting the analysis to this group yields a single internally coherent population and permits use of items available only to graduates, including the retrospectively anchored items discussed below and the direct comparison between official media portrayal and personal work

experience (Q26).

Second, and consequently, discrepancy at the occupational boundary is assessed within persons rather than between groups. Items Q31 and Q33 are retrospectively anchored: Q31 asks whether current compensation meets the expectations the respondent held before joining, and Q33 asks whether adapting to Chinese management practice proved harder than the respondent had imagined. In both cases the comparison is performed by the respondent internally, so the scale midpoint constitutes a meaningful neutral reference and no external comparison group is required.

The design supports claims about how graduates presently characterize their own occupational transition. It does not support claims about change over time in individuals, and none are advanced.

4. Results

4.1 Step 1: Reception of the Immediate Object Layer

The four items measuring the immediate object layer formed a reliable scale (Cronbach's $\alpha = 0.830$), with a composite mean of 4.671 (SD = 0.476) on a five-point scale. Item-level distributions are reported in Table 2.

Responses occupied the upper two scale points for between 89.5% and 97.4% of respondents across the four items, and no respondent selected either of the lower two points on any item. Item standard deviations ranged from 0.49 to 0.69. Q16 recorded both the highest mean in the instrument and the narrowest dispersion among these items. In answer to RQ1, reception coherence was high on all three indicators. Step 1 of the model is therefore satisfied: the sign was received, and received in common.

Table 2: Immediate object layer: response distributions (N = 38).

Item	Content	1	2	3	4	5	TTB %	BTB %	M	SD
Q16	Represents deep China-Egypt friendship	0	0	1	7	30	97.4	0.0	4.76	0.49
Q15	Evokes a modern lifestyle	0	0	1	9	28	97.4	0.0	4.71	0.52
Q17	Embodies Chinese speed and efficiency	0	0	3	7	28	92.1	0.0	4.66	0.63
Q18	Chinese technology better suits Egyptian conditions	0	0	4	9	25	89.5	0.0	4.55	0.69

TTB and BTB denote top-two-box and bottom-two-box proportions.

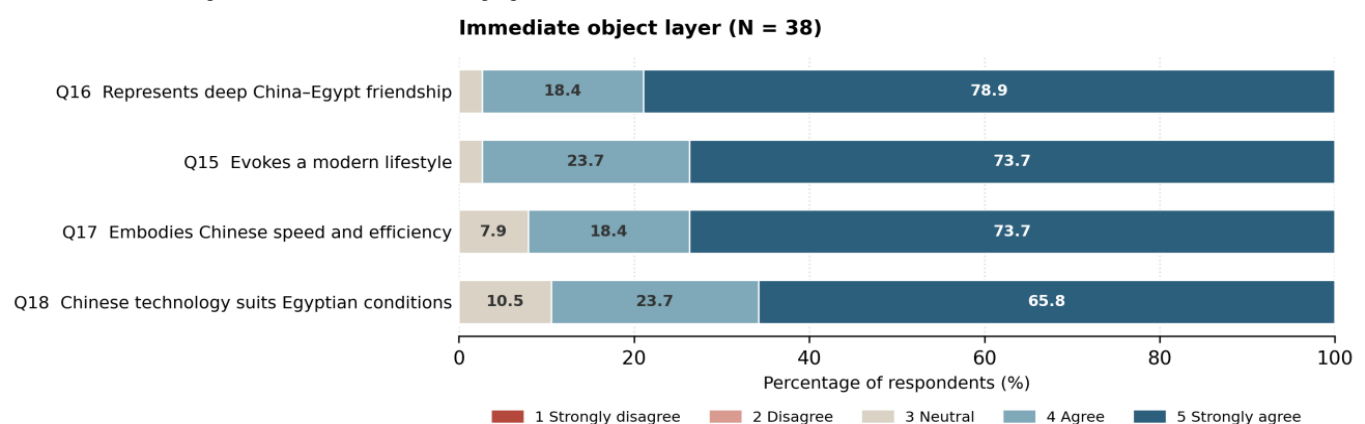


Figure 2: Response distributions for the four immediate object items (N = 38). Bars show the percentage of respondents selecting each scale point; segments below 6% are unlabelled.

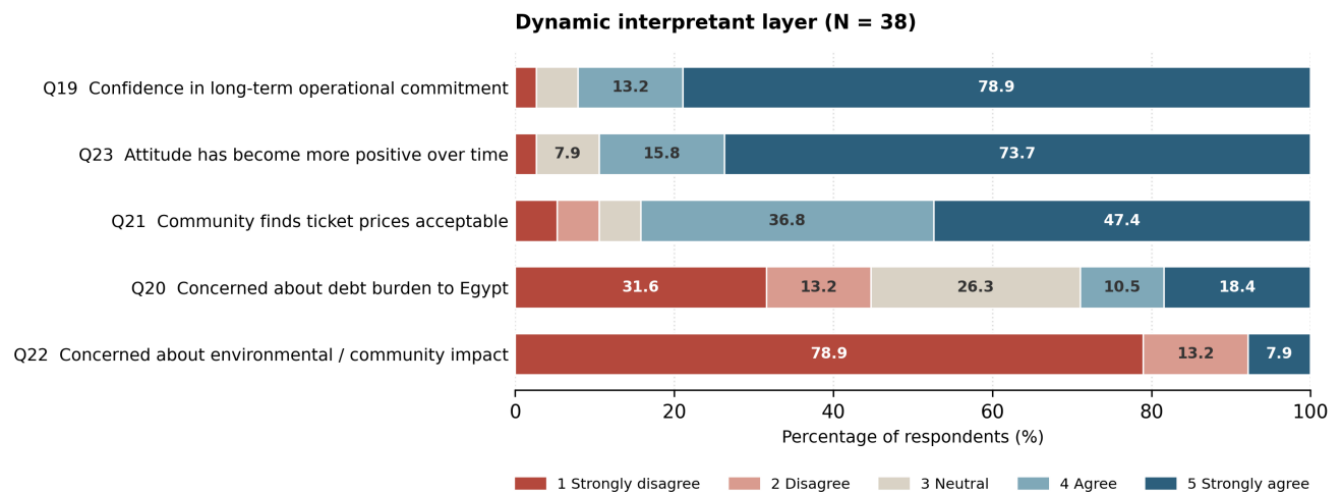
4.2 Step 2: Evaluation across Dynamic Interpretant Dimensions

The dynamic interpretant layer was multidimensional by

design and is therefore not reduced to a single score. Its dimensions are instead compared descriptively in terms of mean, dispersion, and response distribution (Table 3).

Table 3: Dynamic interpretant layer: response distributions (N = 38).

Item	Content	1	2	3	4	5	TTB %	BTB %	M	SD
Q19	Confidence in the operator's long-term commitment	1	0	2	5	30	92.1	2.6	4.66	0.81
Q23	Attitude has become more positive over time	1	0	3	6	28	89.5	2.6	4.58	0.86
Q21	Community finds ticket prices acceptable	2	2	2	14	18	84.2	10.5	4.16	1.10
Q20	Concerned about debt burden to Egypt	12	5	10	4	7	28.9	44.7	2.71	1.49
Q22	Concerned about environmental or community impact	30	5	0	0	3	7.9	92.1	1.45	1.11

**Figure 3:** Response distributions for the five dynamic interpretant items (N = 38). Bars show the percentage of respondents selecting each scale point; segments below 6% are unlabelled. Q20 and Q22 are displayed in their original direction, without reverse scoring.

Dispersion in this layer exceeded that observed in the immediate object layer on every comparable indicator. Figures 2 and 3 make the contrast directly visible. In the immediate object layer, no bar extends into the two disagreement categories, and the neutral category reaches at most 10.5%. In the dynamic interpretant layer, every item registers responses in the disagreement range, and two items are dominated by it. Item standard deviations ranged from 0.81 to 1.49, against 0.49 to 0.69 for the immediate object items. Every item drew responses at both extremes of the scale, whereas no immediate object item drew any response below the midpoint. The debt item was the most widely distributed in the instrument, with responses spread across all five points and no category exceeding 32%; whereas the environmental item concentrated at the scale floor while still drawing three maximum-value responses.

Individual-level dispersion showed the same pattern (Table 4). Within-person mean absolute deviation averaged 0.184 across the immediate object items and 0.686 across the dynamic interpretant items after reverse-scoring Q20 and Q22, with the uncorrected value at 1.291. The median respondent produced identical answers to all four immediate object items, yielding a median D_i of 0.000, whereas the median for the dynamic interpretant items was 0.640. Dispersion was greater in the dynamic interpretant layer for 27 of 38 respondents, equal for 7, and greater in the immediate object layer for 4 (paired $t(37) = -5.361$, $p < 0.001$, $d_z = -0.870$; Wilcoxon signed-rank $p < 0.001$).

Table 4: Within-person mean absolute deviation by layer (N = 38).

Layer	Items (k)	M	SD	Median	Range
Immediate object	4	0.184	0.260	0.000	0.00–0.75
Dynamic interpretant (direction-aligned)	5	0.686	0.551	0.640	0.00–1.92
Dynamic interpretant (uncorrected)	5	1.291	0.537	—	—

This index addresses whether a given respondent answered consistently across a set of meanings, and is therefore independent of whether respondents agreed with one another. Individual respondents converged in attributing symbolic meaning to the project and diverged in evaluating it, and the divergence is a property of individual response patterns rather than an artefact of aggregation.

Step 2 therefore does not inherit the convergence observed at Step 1. Evaluation divided along dimensions that are independent of one another: confidence in long-term operational commitment and reported attitude change clustered at the scale ceiling, fare acceptability admitted a dissenting minority, debt burden divided the cohort across the full scale, and environmental concern concentrated at the floor while retaining a small group at the maximum. In answer to the first part of RQ2, evaluation did not converge to the degree that reception did, the contrast holding at item, distributional, and individual levels alike.

4.3 Step 3: Deployment of the Received Sign

Respondents were asked which aspect of the project they perceived as most favourably received by fellow citizens, were they to introduce it to the Egyptian public (Q35). The distribution appears in Table 5.

Table 5: Communicative selection (Q35; N = 38).

Option	n	%
Advanced technology	13	34.2
Improved commuting comfort	13	34.2
Job creation	6	15.8
Political friendship between China and Egypt	3	7.9
Other	3	7.9

Technical and utilitarian options together accounted for 68.4% of responses, while the friendship frame was selected by 3 respondents (7.9%). This distribution contrasts with the results in Section 4.1, where the corresponding item recorded

the instrument's highest mean. Among the 30 respondents who assigned Q16 the maximum score, 2 selected the friendship frame at Q35.

The divergence is therefore not attributable to variation in symbolic endorsement across respondents. The same individuals who affirmed most strongly that the project represents China-Egypt friendship declined, at rates approaching unanimity, to select that proposition as the one their fellow citizens would receive most favourably. In answer to RQ3, the propositions most strongly endorsed as representing the project and those perceived as most favourably received by fellow citizens do not coincide, and the two rankings are close to inverted. Step 3 accordingly does not follow from Step 1: reception of a sign did not entail its re-encoding for an audience outside the cohort.

4.4 Step 2 Revisited: Prompted versus Open-Ended Elicitation of Community Concerns

Q20, a closed-ended item concerning debt burden, produced the widest dispersion in the instrument ($M = 2.71$, $SD = 1.49$), with responses distributed across the full scale range. Q34 asked respondents to identify the criticism or concern most frequently encountered in their social circle or online. Categorized results appear in Table 6.

Table 6: Community concerns reported under open-ended elicitation (Q34; $N = 38$; multiple categories permitted).

Category	n	%
Ticket price and affordability	13	34.2
Practical utility and ridership	9	23.7
Explicitly reports no criticism	8	21.1
Service hours and headway	5	13.2
Construction or project quality	2	5.3
National debt	1	2.6
Station siting and accessibility	1	2.6
Operational safety	1	2.6
Invalid or blank	2	5.3

Debt, which registered as a substantially endorsed and widely dispersed concern under closed-ended prompting, was reported by one respondent under open-ended elicitation. Transparency, prominent in international coverage of Chinese development finance and identified as a component of China's damaged political image in analysis of Egyptian press coverage [2], did not appear at all. Concerns recalled under open-ended elicitation clustered instead around operational and affordability dimensions, with fare levels, service utility, and schedule adequacy together accounting for 27 of the 32 substantive category assignments. In answer to the second part of RQ2, closed-ended prompting and open-ended elicitation yield substantially different concern profiles from the same respondents, with the agenda prominent in international discourse appearing under prompting and largely absent without it.

4.5 Domain Specificity of Discrepancy at the Occupational Boundary

Retrospectively anchored items were tested against the scale midpoint (Table 7).

Both items departed significantly from the midpoint, in substantively opposite directions. Compensation was rated

significantly below prior expectation, indicating economic discrepancy at the occupational boundary. Adaptation to Chinese management practice was significantly rejected as having exceeded prior expectation, indicating the absence of a corresponding cultural discrepancy. Discrepancy was thus confined to material terms of employment rather than distributed across the occupational transition as a whole. Respondents also reported functioning capably in Chinese-language workplace communication ($M = 4.18$, $SD = 0.87$), which locates the unmet expectation in the contractual terms of employment rather than in the cross-cultural conditions of the work itself.

Table 7: Retrospective assessment of the occupational boundary ($N = 38$).

Item	Content	M	SD	t(37)	p	d
Q31	Compensation meets pre-employment expectations	2.1 3	1.23	-4.3 38	< 0.00 1	-0. 704
Q33	Adaptation to Chinese management proved harder than anticipated	2.3 4	1.34	-3.0 24	0.00 5	-0. 491

4.6 Structure of Narrative Agency

The three narrative agency items did not form a reliable scale ($\alpha = 0.427$), with inter-item correlations from $r = 0.129$ to $r = 0.306$. Descriptive statistics for these and related items appear in Table 8.

Table 8: Narrative agency and media environment ($N = 38$).

Item	Content	M	SD
Q29	Identifies as a bridge between Chinese technology and Egyptian society	4.68	0.57
Q27	Proactively clarifies when the project is misunderstood	4.61	0.82
Q26	Official media reporting corresponds to personal work experience	4.05	1.09
Q28	Frequently shares workplace experience with own social circle	3.32	1.58
Q24	Trusts social media commentary over official news	3.05	1.33
Q25	Frequently encounters negative online commentary	2.18	1.20

Intermediary identification and corrective intervention recorded high means with narrow dispersion, whereas unprompted dissemination was markedly lower and the most widely dispersed of the three ($SD = 1.58$). The low reliability coefficient reflects this divergence rather than measurement error: the items index distinct behavioural orientations, with responsive correction and self-initiated circulation varying independently.

Q26 provides a separate reference point. Respondents rated official media portrayal as broadly corresponding to their own work experience ($M = 4.05$), indicating that the pattern in Section 4.3 did not arise from perceived inaccuracy in official accounts.

In an open-ended item asking which aspects of the training program should be strengthened (Q36), no respondent identified communication with the surrounding community, narrative capability, or public explanation of the project as an area requiring development.

5. Discussion

5.1 Locating the Case within the Existing Evidence Base

The three research questions receive divergent answers, and the divergence is the substantive result. Reception converged (RQ1), evaluation did not inherit that convergence and proved dependent on how it was elicited (RQ2), and deployment followed from neither (RQ3).

This pattern is legible only because the three steps were measured separately, and the existing evidence base offers few precedents for doing so. Corpus-based discourse analysis of Kenyan coverage documents a decade-long thematic shift without measuring what any audience concluded from it [1], and framing analysis of Egyptian coverage reaches a recommendation about public diplomacy on the same basis [2]. Mixed designs in Myanmar and Latin America extend to audience measurement but pair media agendas with national attitudes rather than with project-level interpretation [7,8,10,11]. Survey work on users of Chinese-built transport infrastructure in Southeast Asia measures evaluative response and general impression without addressing what those users take the projects to represent [6]. Each of these designs addresses one step, or the conditions under which one step fails, without separating it from what follows. The inference that a documented change in discourse constitutes a change in host-country perception, common in this literature, presupposes precisely the continuity that the present case does not exhibit.

5.2 Reception (RQ1): Convergence around a Specified Object

That Step 1 was completed is not a trivial finding, since it establishes the condition under which the subsequent breaks become interpretable. Convergence held at three levels, and the individual-level index is the most consequential of them: the median respondent gave identical answers to all four reception items, so the observed consensus is a property of individual response patterns rather than an artefact of averaging across a heterogeneous cohort. The training program and the workplace together functioned as an effective transmission apparatus, and the official symbolic repertoire reached its intended recipients substantially intact.

Object specificity plausibly contributes to this result. Comparative work has raised the possibility that coupling between exposure and cognition strengthens where the object evaluated is a single named project rather than a diffuse country-level relationship, and the object here is singular, named, and physically present in respondents' daily working lives. A sign whose referent can be pointed to constrains the range of meanings that can plausibly be attributed to it, which is a condition that country-level attitude measures do not satisfy. The qualification, developed in the following section, is that this constraint does not extend beyond reception.

5.3 Evaluation (RQ2): Dimensional Independence and the Elicitation-Dependence of Concern

Evaluation diverged in two respects, and the two are distinct findings rather than one finding measured twice.

The first is dimensional. Respondents agreed on what the railway represents while disagreeing over its fares, its fiscal implications, and its environmental consequences. The

theoretical framework anticipates this: the immediate object is internal to the sign and therefore shared among those who receive it, whereas the dynamic interpretant is the effect produced in a particular interpreter, and effects arising along analytically independent dimensions carry no requirement of covariance. Object specificity therefore governs Step 1 without governing Step 2. Specificity constrains what a sign can be taken to represent; it does not constrain how the thing represented is judged. A methodological corollary follows for construct validation: where dimensions are independent by design, internal consistency is a property to be reported rather than engineered, and a single reliability coefficient is not an adequate summary of such a layer.

The second divergence is procedural and, in the first instance, methodological. Debt registered under closed-ended prompting as the most widely dispersed item in the instrument, a result that would ordinarily support the inference that it constitutes a live and divisive local concern. Under open-ended elicitation it was recalled once, and transparency, prominent in international coverage and identified in prior framing analysis of Egyptian press treatment of China [2], was not recalled at all. The pattern recurs within a single topic, since respondents endorsed the proposition that their community finds fares acceptable while simultaneously reporting fare levels as the criticism they most frequently encounter.

The implication extends well beyond this instrument. Perception research on the BRI frequently derives its item pool from media content, a practice that follows naturally from agenda-setting designs in which media and public agendas are compared across a common set of issues [16]. That procedure is appropriate where the object of study is agenda transfer. It is not appropriate where the object is what a host-country population attends to unprompted, because a closed-ended scale measures a respondent's position on a proposition supplied to them, whereas an open item measures which propositions they supply. Studies reporting host-country concern about debt or governance on the basis of closed-ended instruments alone may be registering the salience of an international discourse rather than a local one.

5.4 Deployment (RQ3): Endorsement without Re-encoding

The break at Step 3 is the finding that existing frameworks do not anticipate. Soft power theory treats attraction as converting into influence [17], and the presumption literature treats reception and production as continuous [22]; both presuppose a sequence this cohort did not complete. Attraction is present at close to the measurement ceiling, and the two readiest alternative explanations are contradicted by respondents' own ratings, since they neither doubted the official account nor rejected the intermediary role. What is absent is an intermediate judgment about the receiving audience: whether an attractive proposition will move anyone else. The structure resembles the third-person effect, in which individuals accept a message while estimating that others will not [23], and where the estimate rather than the acceptance governs subsequent behaviour. The deficit is thus one of perceived relevance rather than credibility, a distinction obscured wherever perception research treats endorsement of

a frame as evidence that the frame will circulate.

Section 2.3 identified sustained occupational contact as a channel available in principle but unexamined in comparative work, which measures cognition either through mediated exposure [7,8] or through direct product use [6]. The data locate an asymmetry within that channel. Reception and production are distinct competences, and this cohort demonstrates the first without the second: respondents identify strongly as intermediaries yet report low and widely dispersed unprompted sharing.

Two features of the data indicate that the obstacle is not indifference. Respondents possess the audience knowledge that re-encoding would require, since their selections identify technological capability and commuting benefit as the propositions they perceive as most favourably received locally, which constitutes a substantive judgment about their own society rather than a refusal to engage. Their corrective interventions are also frequent, so they will act on the project's behalf once a prompt is supplied; correction, however, is definitionally responsive and presupposes a prior utterance. What is absent is the initiating act, and with it the translation of an endorsed proposition into a locally serviceable one. Consistent with this reading, and reported with corresponding caution given the sample size and the absence of correction for multiple comparisons, unprompted sharing was modestly associated with the judgment that official media matches personal experience ($r = 0.352$, $p = 0.030$) and with compensation meeting prior expectation ($r = 0.353$, $p = 0.030$); neither association is large and neither establishes direction.

The Kazakhstan case is the closest available analogue, having found that a strategic narrative succeeded selectively among citizens whose prior identity beliefs already aligned with it [18]. The present cohort represents a high-exposure and high-contact context in which endorsement might reasonably be expected to be comparatively strong, and endorsement was indeed obtained. Yet neither exposure nor occupational proximity translated into self-reported communicative deployment. The findings are consistent with the possibility that prior alignment facilitates endorsement without guaranteeing onward deployment, a proposition requiring direct measurement in future comparative work.

The result bears on a recommendation advanced from the discourse plane. Framing analysis of Egyptian press coverage concluded that China should shift toward people-to-people public diplomacy [2]. Where such a channel already exists in the form of employed host-country nationals, the present results indicate that its activation cannot be assumed. The parallel with social license to operate is instructive: direct experience of a project's conduct generates acceptance [6,19], but acceptance is a Step 2 disposition rather than a Step 3 act.

5.5 Limitations and Directions for Further Research

The population studied is not representative of Egyptian opinion. National survey data record favourable views of China among 64% of a representative sample of Egyptian citizens [5], whereas the present respondents endorsed the project's symbolic content at means approaching the scale

ceiling. For estimating public opinion the sample would be unsuitable; for the question addressed here it constitutes a conservative test, since the central symbol was declined even among respondents with the highest plausible exposure, endorsement, and occupational grounds for regarding the official account as accurate. The corresponding constraint is that the findings speak to the occupational channel alone.

Four further limitations qualify the results. The design is cross-sectional and supports no claims about change within individuals. The deployment measure employed a forced choice among five options, so the low selection of the friendship proposition indicates relative ranking rather than absolute rejection; a rating format permitting multiple endorsements might show that proposition positively valued while still ranked below utilitarian alternatives. Reports of community discourse are respondent proxies rather than direct observation, and may reflect what respondents consider salient as much as what circulates. Finally, respondents may have associated the survey context with their educational background, potentially increasing socially desirable responding.

Four directions follow. First, the divergence documented here should be tested among ordinary users of the line, who encounter the project through use rather than employment, which would establish whether the pattern is specific to the occupational channel or general to the project. Second, object specificity warrants a purpose-built test in which a single population is surveyed on both a named project and the country-level relationship within one instrument, holding region and exposure constant. Third, panel measurement of an occupational cohort would permit the developmental claims the present design cannot support. Fourth, the finding that intermediary identification does not produce circulation invites experimental work on whether the role can be activated, and on where between endorsement and advocacy the process currently halts.

6. Implications and Conclusions

6.1 Optimizing Narrative Communication Strategy

The results support several adjustments to how a flagship project of this kind is communicated, each following from a specific finding rather than from general principle. Their common premise is that Step 1 is not the objective of communication strategy but its starting condition, and that effort concentrated there addresses a step this cohort had already completed.

The first concerns diagnosis. Where a narrative underperforms, the conventional responses are to increase volume or to reinforce credibility. Neither addresses a relevance deficit, since a proposition already believed is not made more usable by being asserted again. Establishing which deficit is operative is therefore a precondition for selecting any remedy.

The second concerns audience differentiation. The friendship frame functioned effectively as an internal symbol, drawing the instrument's highest endorsement among personnel connected to the project, while being almost uniformly set

aside as an external one. A frame that consolidates those already inside a relationship is not thereby suited to those outside it, and a single narrative distributed uniformly across both audiences will succeed with one and pass over the other. Differentiation by audience position, rather than by language or channel alone, is what the finding implies.

The third concerns the substitution of verifiable benefit for relational abstraction. The propositions respondents perceived as most favourably received locally, namely technological capability and improved commuting, share the property of being checkable against ordinary experience. This is consistent with evidence that direct experience of infrastructure shapes disposition independently of accompanying discourse [6], and it suggests that communication anchored in claims a resident can verify by using the line will travel further than claims about the relationship between two states.

The fourth concerns which agenda communication addresses. Local concern under open-ended elicitation centred on fares, service hours, and practical utility rather than on the debt and governance themes prominent internationally. Communication designed against the international agenda therefore risks answering questions the local audience is not asking while leaving unanswered those it is. The corollary for monitoring follows directly: instruments built from media-derived categories will report the agenda they encode, so open-ended elicitation is required to establish what a local public attends to unprompted.

The fifth concerns an unused resource. The audience knowledge documented in Section 5.3 is precisely what Step 3 requires and is currently neither solicited nor incorporated into narrative design. Treating employed host-country personnel as a source of framing intelligence, rather than solely as recipients of framing, would make available at low cost precisely the audience information that adaptive communication requires.

These implications are drawn from a single project and a single occupational cohort, and are offered as hypotheses for communication practice rather than as validated prescriptions.

6.2 Implications for Vocational Education and Training

Three implications follow for order-based talent cultivation programs supplying personnel to transnational infrastructure projects.

First, intermediary capability should be taught as a translation task rather than assumed to follow from technical and cultural preparation. In the terms of the model, current provision reliably delivers Step 1 and does not address Step 3. Graduates in this cohort already hold audience knowledge that diverges systematically from the emphasis of the official narrative, so the pedagogical problem is not supplying content but developing the capacity to reformulate it for audiences outside the workplace. Practically, this points to instruction in which learners analyse how a given claim about the project would be received by different local publics, work from their own communities' priorities toward a defensible formulation, and practise initiating an account rather than defending one.

The distinction from existing provision is that the object of assessment becomes a reformulation the learner produces, not a proposition the learner endorses.

Second, provision cannot be derived from expressed demand. Respondents identify with the bridging role at near-ceiling levels while enacting only its responsive half, and none named community communication, narrative capability, or public explanation as an area requiring development. Self-reported needs assessment may fail to identify capabilities that respondents do not currently conceptualize as developmental needs, and evaluation that records role identification will register a competence that behavioural measures do not confirm. Curricula addressing this gap therefore have to originate the provision and assess enactment directly.

Third, the one domain of unmet expectation observed here concerned the contractual terms of employment, whereas adaptation to cross-cultural working conditions and workplace language use were not experienced as more difficult than anticipated. Since congruence between pre-entry expectations and encountered conditions predicts newcomer attitudes [25] and realistic preview functions partly by signalling institutional candour [26], extending anticipatory socialization to the contractual dimension would address the single discrepancy these data identify.

6.3 Conclusions

This study examined how the symbolic content of a flagship Chinese-built railway is received by the Egyptian technical personnel who operate it, using an instrument constructed on Peircean principles to measure the immediate object and the dynamic interpretant as separate quantities, and supplementing closed-ended measurement with open-ended elicitation of the concerns respondents encounter in their own communities.

The three-step model set out in Section 2.4 separates outcomes that perception research commonly treats as one: reception of symbolic content, evaluation of the object that content represents, and deployment of that content with a further audience. In this case, Step 1 was completed, with symbolic attribution converging both across and within respondents. Step 2 did not inherit that convergence, evaluation dividing along dimensions independent of one another. Step 3 did not follow from either, the most strongly endorsed symbol being selected by 7.9% of respondents as the claim fellow citizens would receive most favourably, against 68.4% for technological capability and commuting benefit combined.

The methodological consequence is that measurement of any one step licenses no inference about the remaining two. This bears on a substantial body of work in which narrative change is documented on the discourse plane and reported as change in host-country perception, since that reading presupposes the correspondence the present case fails to find. A narrative can be transmitted with high fidelity, accepted as accurate, and still fail at the point where its recipients would carry it onward, and a design measuring Step 1 alone cannot detect that failure.

For practice, the implication is that the intermediary model

requires modification rather than abandonment. The cohort studied here occupies the structural position that people-to-people diplomacy presupposes [2] and holds the local knowledge that adaptive framing would require. What the evidence does not support is the assumption that occupying the position and holding the knowledge are jointly sufficient for the role to be enacted, which is to say that Steps 1 and 2 do not deliver Step 3 on their own.

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