EFFECT OF POOR COMMUNICATION ON CONSTRUCTION PROJECT PERFORMANCE ON SITE

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ABSTRACT

Objective: This study aims to establish the effect of poor communication on construction project performance on site by profiling the demographic composition of survey respondents, testing the reliability of the questionnaire scale that measures performance effects, ranking the specific performance effects reported on site, and comparing perceived performance impact across respondent category and project sector

Research Method: A cross-sectional questionnaire survey was administered to Clients/Employers, Consultants and Contractors engaged in construction projects in Sindh, Pakistan. Questionnaire was used to measure effect of communication on project performance with a five-point Likert scale. This yielded in collection of 154 valid responses which were analyzed using descriptive statistics.

Findings: Data analysis showed that internal consistency for a ten-item behavioural scale with Cronbach's alpha of 0.642. Rework caused by unclear or undocumented instructions and quality problems caused by miscommunication were ranked as the most severe communication issues affecting on project performance. Although time delay was the lowest-ranked effect, all performance effects were rated highly by respondents. The findings showed that Clients, Consultants, and Contractors generally agreed on the negative impact of poor communication, with no significant differences between their views. In contrast, respondents working on public-sector projects perceived poor communication to have a greater impact on project performance than those working on private-sector projects.

Originality: This study identifies and confirms the major effects of poor communication among Clients, Consultants, and Contractors on construction project performance in Sindh. It also shows that poor communication has a greater impact on public-sector projects than on private-sector projects, providing useful insights for improving project management and communication practices.

Keywords: Poor communication; project performance; construction site; reliability analysis; Sindh, Pakistan

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1. INTRODUCTION

Construction projects are delivered on site through the coordinated, day-to-day interaction of three principal stakeholders - the Client (or Employer), the Consultant (the design/supervision team) and the Contractor - who together form the construction project "triad". Because this triad is typically assembled only for the duration of a single project and disbands once it is complete, construction has long been recognised as a temporary, multi-organisational undertaking in which the accurate, timely and documented flow of site information between parties is not a peripheral administrative matter but the central mechanism through which the project is actually delivered (Dainty et al., 2006). Emmitt and Gorse (2006) describe communication as the thread that binds otherwise independent construction actors into a functioning site team, and argue that the fragmented, often adversarial structure typical of traditional procurement makes construction sites especially vulnerable to communication breakdown compared with other industries. Ineffective communication exerts negative impact on the quality of a construction project (Waheed et al. 2024). Almansoori et al. (2021a; 2021b) reported that effective communication is a significant driver of successful PMO projects in UAE. When this thread breaks down on site, the consequences are rarely confined to a single, isolated incident. Poor communication propagates directly into measurable performance effects: rework caused by unclear or undocumented instructions, cost overrun, quality defects, disputes and claims, wastage of materials, and strained working relationships among the parties present on site (Love & Li, 2000; Malik et al., 2021). Improper communication is a major problem faced in construction industry (Alameri et al. 2021). Lack of proper communication affects adversely and results in construction waste on site (Ali et al. 2021); The Project Management Institute (2013) reports that ineffective communication is a primary contributor to project failure across industries, placing a substantial proportion of every dollar spent on a project at risk when communication is not managed deliberately. Establishing which of these on-site performance effects are perceived as most severe, whether that perception is shared consistently across the different stakeholder groups working on site, and whether it varies systematically with the type of project being delivered, is therefore a necessary first step before targeted, site-level communication remedies can be designed and prioritised. The present study addresses this issues and examines the effects of poor communication on project performance through a questionnaire survey administered amongst the stakeholders involved in the construction execution.

2. LITERATURE REVIEW

A substantial body of international research links poor communication directly to adverse construction project performance outcomes. Using a partial least squares structural equation model of 262 Malaysian construction practitioners, Gamil and Abd Rahman (2023) identified 30 distinct causes and 17 distinct effects of poor communication, concluding that poor communication is one of the main factors triggering construction project failure, including project delay, cost overrun and dispute. In a more recent Malaysian study, Yap and Oo (2025) surveyed 106 clients, consultants and developers and identified five primary causes of poor communication — namely a lack of effective communication between parties, poor planning and coordination, inadequate communication skills, unclear objectives, and improper communication channels — underscoring that communication breakdown remains a persistent, multi-causal problem even in a relatively advanced construction market. Suleiman (2022), examining communication-related factors across construction firms in the Middle East and North Africa region, validated 18 factors as significantly important to project outcomes, a finding subsequently reinforced by Suleiman et al. (2023) in a Jordan-specific study, which identified differing levels of education among construction teams, the absence of a formal communication plan, and the lack of an appropriate communication medium as the leading causes of poor communication on Jordanian sites. Within the African context, Ejohwomu et al. (2017) surveyed 100 consultants and contractors in Nigeria and found that unclear project objectives, ineffective reporting systems and poor leadership were ranked as the most significant barriers to effective communication, while Al-Otaibi et al. (2025), comparing building projects in Ghana and Saudi Arabia, similarly ranked poor communication as the single most significant barrier to project performance in both countries. Ishaq et al. (2018) further found that communication problems statistically explained a substantial share of the variance in project delivery outcomes on Nigerian projects. Love and Li (2000) quantified rework specifically, finding that a lack of clear, documented instruction and design information is among the most consistently cited causes of rework-related cost and time overrun on construction sites — a finding directly relevant to the present study's highest-ranked performance effect.

Within Pakistan specifically, Ahmed et al. (2021) surveyed construction professionals nationally and found that although email, computer-aided design (CAD) drawings and phone calls were the most frequently used communication channels on site, structured written documents and stakeholder meetings were rated far more effective by the same respondents — a mismatch between what practitioners actually use on site and what they themselves regard as reliable, and one that plausibly underlies the high ranking of undocumented-instruction effects reported in this study. Malik et al. (2021) further demonstrated, across a sample of construction professionals, that communication quality affects project success both directly and indirectly through its effect on interpersonal conflict, reinforcing that the performance effects of poor communication extend beyond technical rework into strained working relationships among site parties, one of the effects measured in this study.

Comparatively little published work, however, has statistically tested whether the perceived performance impact of poor communication differs systematically across stakeholder categories or across public- and private-sector projects within a single developing-country dataset; most of the studies cited above, including those from Malaysia, Nigeria, Jordan and the Ghana–KSA comparison, rank causes or effects descriptively but do not test for significant differences across respondent category or procurement sector. Public-sector construction procurement in Sindh is governed by the Sindh Public Procurement Act, 2009 (Government of Sindh, 2009), which imposes formal, multi-stage documentation and approval requirements that differ materially from the more direct commissioning arrangements typical of private-sector work; this institutional difference provides a plausible basis for the sector-level comparison undertaken in this study. Addressing this gap, the present study statistically ranks the specific on-site performance effects of poor communication reported in Sindh and, for the first time in this context, formally tests whether perceived performance impact varies by respondent category (via one-way ANOVA) and by project sector (via an independent-samples t-test with Levene's test for homogeneity of variance).

3. METHODOLOGY

This study used a quantitative, cross-sectional questionnaire survey design. The survey instrument collected demographic information about the respondents and their projects (respondent category, years of experience, highest qualification, project sector, project type, and approximate project value). Next section of the questionnaire measured ten parameters on the effect of poor communication on project performance (coded PE1–PE10), each rated on a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The survey was distributed electronically to Clients/Employers, Consultants, and Contractors involved in construction projects across Sindh, Pakistan, using a convenience/purposive sampling approach, which is appropriate for a defined professional population that cannot be fully listed or sampled through a complete sampling frame (Etikan et al., 2016). After data cleaning, a total of 154 valid and complete responses were retained for analysis..

3.1 RELIABILITY ANALYSIS

Internal consistency of parameters of communications affecting project performance was assessed using Cronbach's alpha (Cronbach, 1951), computed as:

$$\alpha = [\, k / (k - 1) \,] \times [\, 1 - (\Sigma\sigma_i^2 / \sigma_t^2) \,] \quad (1)$$

where k is the number of items in the scale, σ_i^2 is the variance of item i, and σ_t^2 is the variance of the total scale score. Rahman et al. 2013 cited that reliability of the data is considered at low level when Cronbach α is less than 0.3 which means the data is not reliable and cannot be accepted. Reliability is at high level when Cronbach α is more than 0.7. Saleh Almansoori et al. (2021) cited George and Mallery's (2003) for interpretive benchmarks of reliability analysis as, $\alpha \geq 0.9$ is classified as excellent, 0.8-0.9 as good, 0.7-0.8 as acceptable, 0.6-0.7 as questionable, 0.5-0.6 as poor, and below 0.5 as unacceptable. Item-total statistics, including each item's corrected item-total correlation and the scale alpha if that item were deleted, were computed to identify individual items that weaken the scale's overall reliability.

3.2 COMPARATIVE ANALYSIS

The overall perceived performance impact; calculated as the average of the ten performance-effect scores for each respondent was compared across the three respondent categories (Client/Employer, Consultant, and Contractor) using a one-way between-groups analysis of variance (ANOVA), with the resulting F-statistic evaluated at a significance level of $\alpha = 0.05$. In addition, overall perceived performance impact was compared between respondents from public-sector and private-sector projects using an independent-samples t-test. Before conducting this test, Levene's test for homogeneity of variance (Levene, 1960) was used to check whether the variances of the two sector groups could be considered equal. Where Levene's test showed that the variances were not equal, Welch's t-test was used instead, as it does not assume equal variances and adjusts the degrees of freedom accordingly using the Welch-Satterthwaite equation, in line with standard practice for comparing groups that differ in size and variance (Field, 2013).

4. RESULTS AND DISCUSSIONS

4.1 DEMOGRAPHIC PROFILE OF RESPONDENTS

Table 1 summarises the demographic composition of the 154 survey respondents. Contractors formed the largest respondent group (39.6%), followed by Consultants (31.2%) and Clients/Employers (28.6%), giving a reasonably balanced representation of all three parties in the construction triad. A large majority of respondents (55.2%) reported more than 15 years of professional experience, and 42.8% held a Master's degree or higher, indicating that the sample was drawn predominantly from experienced, well-qualified construction professionals whose perceptions of on-site communication and performance can be regarded as informed. In terms of project characteristics, 68.8% of respondents' projects were public-sector and 30.5% private-sector, and 80.5% of projects had an approximate value exceeding PKR 500 million, indicating that the sample was weighted toward large, formally administered projects - the category of project in which documented, multi-party communication is most consequential.

Table 1: Demographic Profile of Survey Respondents (n = 154)

Demographic Variable	Category	Frequency	Percent (%)
Respondent Category	Client/Employer	44	28.6
	Consultant	48	31.2
	Contractor	61	39.6
Years of Experience	Less than 5 years	2	1.3
	5-10 years	23	14.9
	11-15 years	42	27.3
	More than 15 years	85	55.2
Highest Qualification	Diploma	33	21.4
	Bachelor's	55	35.7
	Master's	57	37.0

Demographic Variable	Category	Frequency	Percent (%)
	PhD	9	5.8
Project Sector	Public	106	68.8
	Private	47	30.5
Project Type	Building	52	33.8
	Infrastructure	74	48.1
	Housing	28	18.2
Approximate Project Value (PKR)	Less than 50 million	1	0.6
	50-500 million	28	18.2
	More than 500 million	124	80.5

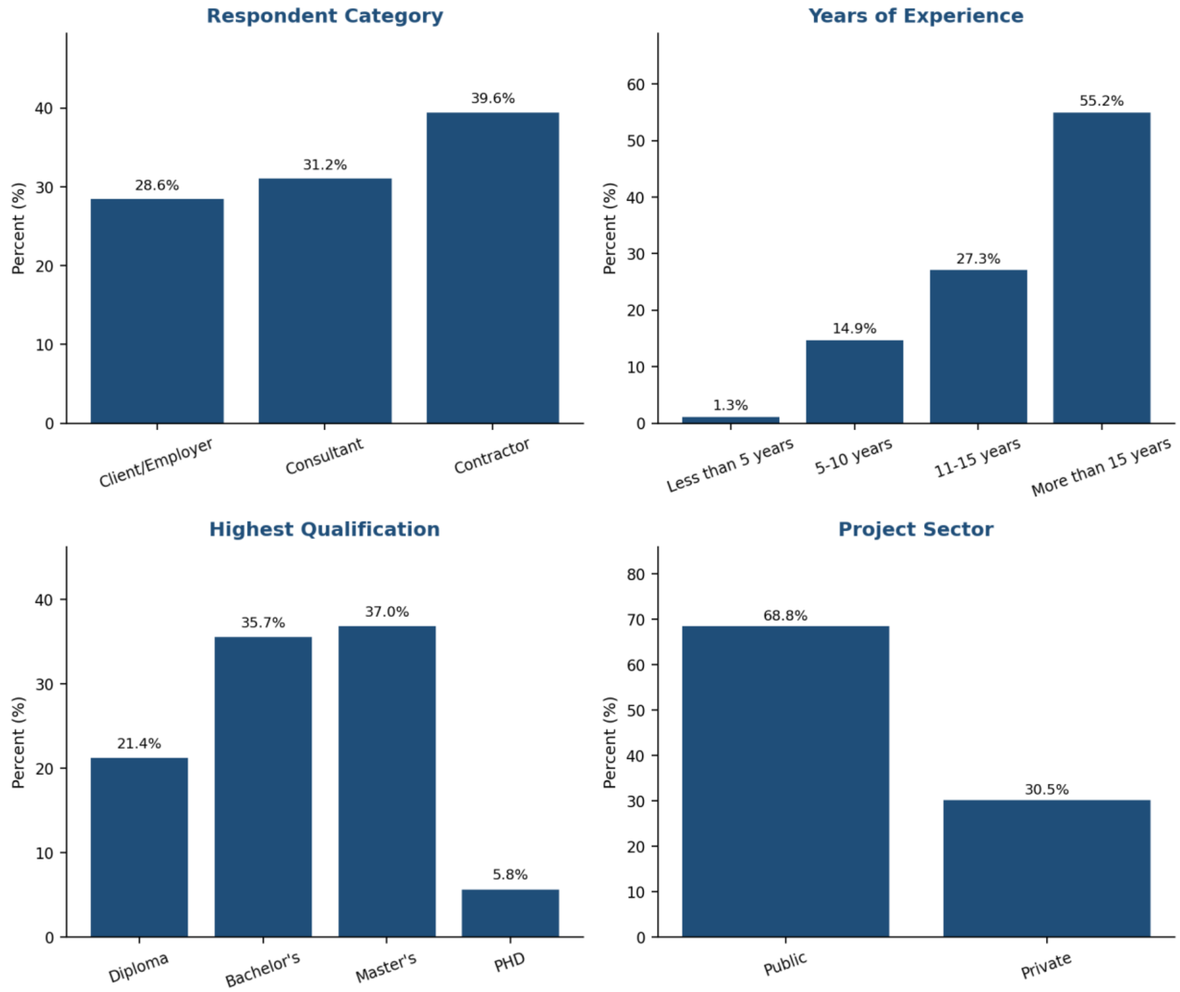

Figure 1: Respondent and Project Demographic Profile

4.2 RELIABILITY OF THE EFFECT ON PROJECT PERFORMANCE

Reliability of the ten-items computed using Equation (1) on 148 valid cases (listwise), returned a Cronbach's alpha of α = 0.642, which is classified as "questionable" under George and Mallery's (2003) benchmarks but nonetheless within the range regarded as usable for exploratory behavioural research, particularly for a ten-item scale spanning several qualitatively distinct performance effects (delay, cost, quality, relationships) rather than a single narrow construct.

Table 2: Reliability Statistics for the Section D Scale

Scale	No. of Items	N (Valid Cases)	Cronbach's Alpha	Interpretation
Effect on Project Performance (Section D)	10	148	0.642	Questionable

Table 3 reports the item-total statistics for the ten Section D items. Corrected item-total correlations ranged from 0.235 (PE4) to 0.372 (PE7), and no single item's removal would raise the overall alpha above 0.642 (the highest "alpha if item deleted" value is 0.631, for PE4), indicating that all ten items make a broadly consistent, non-redundant contribution to the scale and that none should be dropped on reliability grounds alone.

Table 3: Item-Total Statistics for the Parameters

Code	Statement (abbreviated)	Corrected Item-Total r	Alpha if Item Deleted
PE1	Time delay caused by communication gaps	0.345	0.613
PE2	Cost overrun caused by communication gaps	0.244	0.629
PE3	Rework caused by unclear/undocumented instructions	0.310	0.617
PE4	Quality problems caused by miscommunication	0.235	0.632
PE5	Disputes/claims caused by communication breakdowns	0.340	0.610
PE6	Reduced productivity/efficiency	0.315	0.616
PE7	Wastage of materials or resources	0.372	0.603
PE8	Strained working relationships/conflict	0.301	0.619
PE9	Scope changes/variations from misunderstandings	0.333	0.612
PE10	Overall dissatisfaction from communication problems	0.303	0.623

4.3 RANKING OF COMMUNICATION-RELATED PERFORMANCE-EFFECT STATEMENTS

Table 4 and Figure 2 show that rank of the ten parameters by mean score. All ten items returned a mean above 4.28 on the five-point scale - well above the scale midpoint of 3.0 - confirming that respondents perceive poor communication as having a consistently severe effect on project performance across every effect measured, with no single effect dismissed as negligible. Rework caused by unclear or undocumented instructions (PE3, mean = 4.497, SD = 0.540) was ranked highest, closely followed by quality problems caused by miscommunication (PE4, mean = 4.494, SD = 0.574). This is directly consistent with the findings of (Love and Li 2000) who identifed a lack of clear, documented instruction as among the most consistently cited drivers of construction rework, and Ahmed et al. (2021) found that Pakistani practitioners regard informal channels as less reliable than the structured, written documentation whose absence this study's respondents rank as most damaging.

Time delay caused by communication gaps (PE1, mean = 4.288, SD = 0.468) was ranked lowest among the ten effects, and also returned the smallest standard deviation, suggesting the most uniform agreement among respondents - though still a high absolute mean, indicating that even the least-severe effect in this study remains a substantial, widely shared concern rather than a marginal one.

Table 4: Ranking of Communication Issues Affecting Project Performance

Rank	Code	Statement	Mean	SD
1	PE3	Rework caused by unclear or undocumented instructions	4.497	0.540
2	PE4	Quality problems caused by miscommunication between parties	4.494	0.574
3	PE2	Cost overrun caused by communication gaps	4.438	0.498
3	PE6	Reduced productivity/efficiency from communication-related delays	4.438	0.605
3	PE9	Scope changes/variations from communication-related misunderstandings	4.438	0.677
6	PE7	Wastage of materials or resources caused by poor communication	4.416	0.602
7	PE5	Disputes/claims caused by communication breakdowns	4.405	0.612
8	PE8	Strained working relationships/conflict from communication problems	4.370	0.615
9	PE10	Overall dissatisfaction caused by communication problems	4.344	0.795
10	PE1	Time delay caused by communication gaps	4.288	0.468

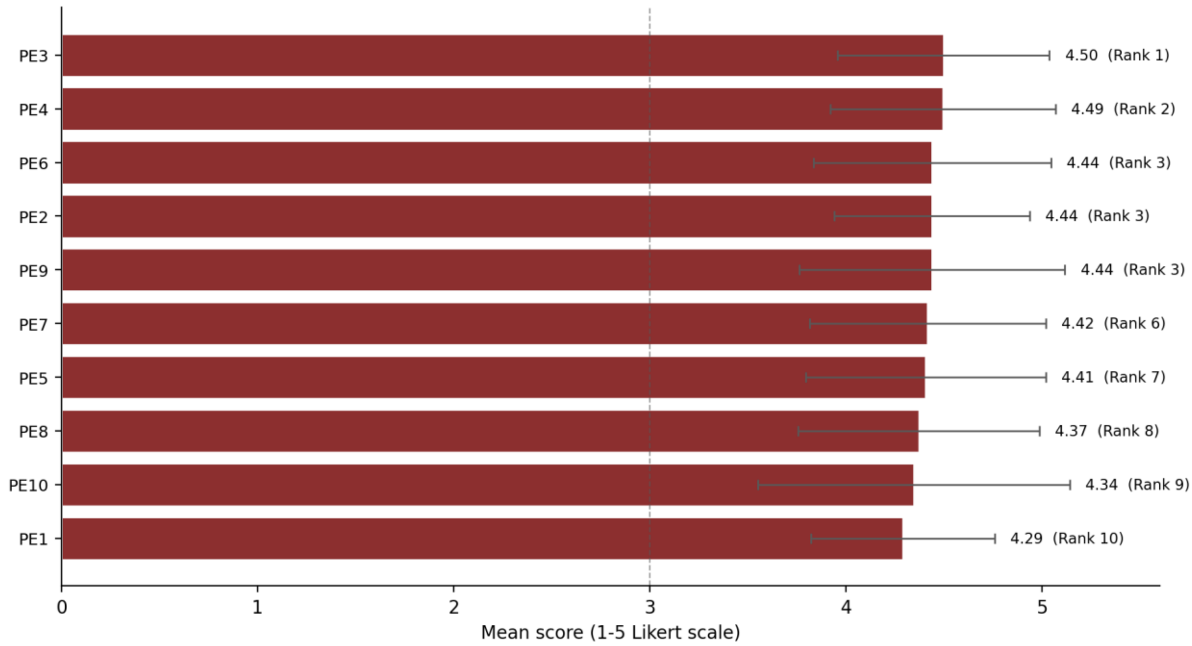

Figure 2: Ranking of Section D Performance-Effect Statements by Mean Score

4.4 COMPARISON OF PERCEIVED PERFORMANCE IMPACT ACROSS RESPONDENT CATEGORY AND PROJECT SECTOR

4.4.1 Comparison by Respondent Category (One-Way ANOVA)

A one-way ANOVA was conducted to test whether perceived overall performance impact (the mean of the parameters) differed across the three respondent categories. Group descriptive statistics are reported in Table 5 and the full ANOVA source table in Table 6.

Table 5: Group Descriptive Statistics for Overall Performance Impact by Respondent Category

Category	N	Mean	SD
Client/Employer	44	4.338	0.201
Consultant	48	4.441	0.292
Contractor	61	4.446	0.345

Table 6: One-Way ANOVA - Overall Performance Impact by Respondent Category

Source	Sum of Squares	df	Mean Square	F	p
Between Groups	0.355	2	0.177	2.066	0.130
Within Groups	12.886	150	0.086		
Total	13.241	152			

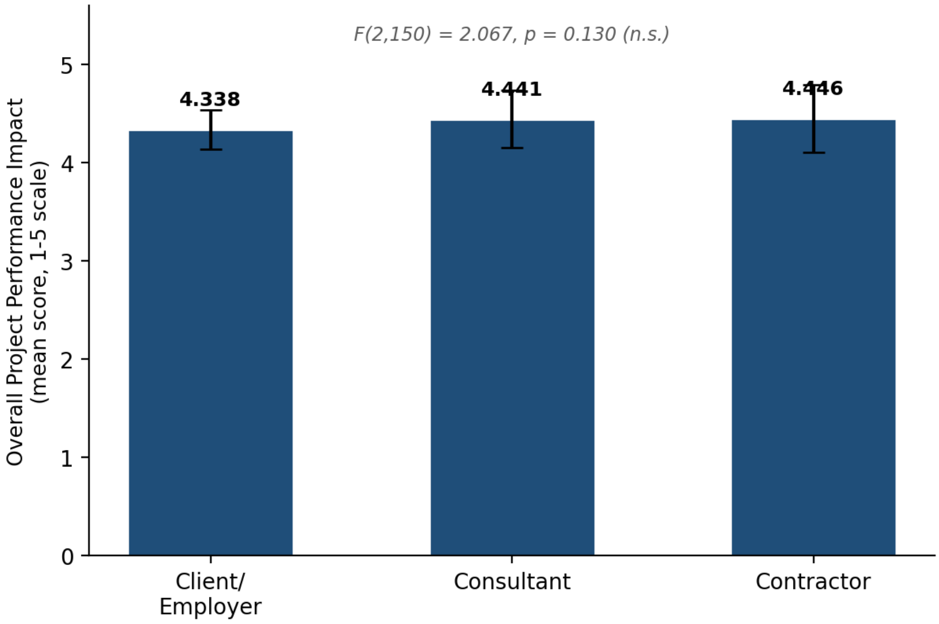

Figure 3: Overall Performance Impact (Mean ± SD) by Respondent Category

The ANOVA result was not statistically significant, $F(2, 150) = 2.066$, $p = 0.130$ ($p > 0.05$), indicating that Clients/Employers, Consultants and Contractors do not differ significantly in how severely they perceive poor communication to be affecting project performance on site. Although Contractors (mean = 4.446) and Consultants (mean = 4.441) reported a marginally higher mean impact than Clients/Employers (mean = 4.338), this difference is not large enough, relative to the within-group variability, to be attributed to anything other than chance. This finding is itself informative: it indicates that the negative performance effect of poor communication documented in Section 4.3 is a shared perception across the construction triad rather than a grievance concentrated in, or exaggerated by, any single party - strengthening the case that site-level communication improvement measures should be designed jointly rather than targeted at one stakeholder group alone.

4.4.2 Comparison by Project Sector (Independent-Samples t-test)

Overall performance impact was further compared between respondents working on public-sector and private-sector projects. Group descriptive statistics are reported in Table 7.

Table 7: Group Descriptive Statistics for Overall Performance Impact by Project Sector

Sector	N	Mean	SD
Public	106	4.447	0.337
Private	47	4.336	0.144

Levene's test for homogeneity of variance indicated that the equal-variance assumption underlying the standard (pooled) t-test was violated, $F = 18.179$, $p < 0.001$, with the Public-sector group's standard deviation (0.337) more than double that of the Private-sector group (0.144). Consistent with the methodological approach set out in Section 3.2, Welch's unequal-variances t-test - which does not assume equal population variances - was therefore used as the statistically appropriate test, rather than the pooled t-test. The results of both tests are reported in Table 8 for transparency, with Welch's t-test treated as the primary result.

Table 8: Levene's Test and Independent-Samples t-test Results for Overall Performance Impact by Project Sector

Test	Statistic	df	p	Decision
Levene's Test for Equality of Variances	F = 18.179	1, 151	< 0.001	Variances not assumed equal
Pooled (equal-variance) t-test	t = 2.176	151	0.031	Reported for reference only
Welch's (unequal-variance) t-test	t = 2.864	150.87	0.005	Primary result - significant

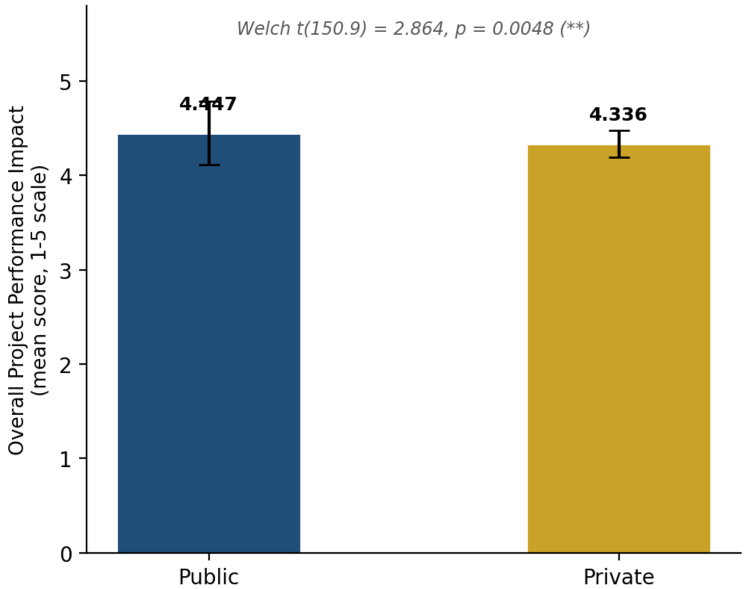

Figure 4: Overall Performance Impact (Mean ± SD) by Project Sector

Welch's t-test confirmed a statistically significant difference in perceived overall performance impact between the two sectors, $t(150.87) = 2.864$, $p = 0.005$ ($p < 0.01$). Respondents on public-sector projects perceived a significantly greater performance impact from poor communication (mean = 4.447) than respondents on private-sector projects (mean = 4.336). This is consistent with the institutional context described in Section 2: public-sector projects in Sindh are administered under the formal, multi-stage documentation and approval requirements of the Sindh Public Procurement Act, 2009 (Government of Sindh, 2009), which route a greater volume of information through more numerous, often slower approval and reporting channels than the more direct commissioning arrangements typical of private-sector work. This larger, more procedurally mediated volume of required communication on public-sector sites plausibly creates more numerous points at which gaps, delays or ambiguity in that communication can translate into a perceptible effect on performance - offering a substantive, institutionally grounded explanation for the significantly higher impact reported by public-sector respondents, over and above sampling variation alone (noting also that Table 1 shows the sample itself is weighted toward large, public-sector projects, so this result is well supported by the available data).

4.5 DISCUSSION

Taken together, the findings from Sections 4.1 to 4.4 present a coherent account of how communication deficiencies influence construction project performance in Sindh. The respondent profile indicates a well-qualified and experienced sample drawn from Clients, Consultants, and Contractors, predominantly engaged in large-scale, formally administered projects, which lends credibility to the subsequent results. The reliability coefficient ($\alpha = 0.642$) is within an acceptable, if modest, range by conventional benchmarks (George & Mallery, 2003) for a ten-item scale spanning several qualitatively distinct performance effects, consistent with the generally moderate alpha values reported elsewhere in construction-management survey research using multi-dimensional Likert instruments (Malik et al., 2021). The ranking analysis identifies rework arising from unclear or undocumented instructions, and quality deficiencies resulting from miscommunication, as the two most severe consequences of poor communication, directly corroborating Love and Li's (2000) identification of unclear, undocumented instruction as a leading driver of construction rework, and reinforcing Ahmed et al.'s (2021) finding that Pakistani practitioners themselves regard undocumented, informal communication channels as unreliable. Furthermore, the comparative analysis reveals that the perceived impact of poor communication does not differ significantly across the Client, Consultant, and Contractor categories, whereas it is perceived as significantly more pronounced on public-sector projects than on private-sector projects, a difference plausibly rooted in the greater procedural communication burden imposed by public-sector procurement regulation in the province (Government of Sindh, 2009). Collectively, these findings suggest that communication-improvement initiatives on construction sites in Sindh, particularly within the public sector, should prioritise the formal documentation and confirmation of instructions and decisions, as the absence of such documentation is identified as the most damaging consequence of poor communication on project performance.

5. CONCLUSIONS

This study aimed to determine the effect of poor communication on construction project performance on site in Sindh, Pakistan, based on the demographic profile, reliability testing, item ranking, and comparative analysis of communication-related parameters from a structured questionnaire completed by 154 Clients/Employers, Consultants, and Contractors. The scale measuring the effect on project performance showed acceptable, though modest, reliability ($\alpha = 0.642$), and all ten performance effects examined scored well above the midpoint, confirming that poor communication is consistently regarded as a serious problem on construction sites. Rework caused by unclear or undocumented instructions and quality problems arising from miscommunication were identified as the most severe effects, while time delay, although still substantial, was ranked as the least severe. The perceived impact of poor communication did not vary significantly across respondent categories, suggesting that Clients, Consultants, and Contractors share a similar view of the problem; however, it did vary significantly by project sector, with public-sector respondents perceiving a greater impact than those from the private sector.

These results suggest that the lack of clear, documented instructions — rather than delay or relationship issues alone — is the most significant communication-related problem affecting construction project performance on site in Sindh, and that this issue is more strongly felt on public-sector projects. Based on this, it is recommended that construction organisations in Sindh, and particularly those administering public-sector projects, prioritise the formal documentation and written confirmation of site instructions, for instance through the mandatory use of a shared digital platform or common data environment, as the most direct and evidence-based way to reduce the impact of poor communication on project performance. This study is limited by its use of a single, self-reported, cross-sectional survey and a convenience-based sample; future research could strengthen these findings by using an independently measured performance outcome, adopting a longitudinal design, and drawing on a larger, randomly selected sample, as well as by examining whether the sector-based difference identified here remains significant after accounting for project value and project type.

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