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Supervisory Support and Its Impact on Work-Life Balance Among Women Conductors of Telangana State Road Transport Corporation (TGSRTC), Hyderabad: An Empirical Study

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Abstract

Purpose: This paper examines whether supervisory cooperation, leave sanction, management recognition and shift type predict the work-life integration (WLI) of women conductors of the Telangana State Road Transport Corporation (TGSRTC), Hyderabad, drawing on Conservation of Resources and Social Exchange theories.Hobfoll, 1989)Blau, 1964/2017; Cropanzano & Mitchell, 2005; Stranzl & Ruppel, 2025)

Design/Methodology/Approach: Survey data from 600 women conductors across 25 depots were analysed using correlation, chi-square tests and multiple OLS regression with diagnostics and robust standard errors.

Findings: The four-predictor model does not predict WLI ($R^2 = 0.002$, $p = 0.839$), and no predictor is significant; the result is robust to estimator and measurement choices. WLI is moderately positive ($M = 3.26$). Only one of 24 chi-square tests of workplace-support dimensions against marital status and spouse employment is significant, consistent with chance.

Research Limitations: Single-item predictors, evenly spread responses and a cross-sectional design limit inference; the result indicates no detectable association rather than no effect.

Practical Implications: No single supervisory lever should be prioritised for its effect on WLI; concerns about leave sanction and management listening remain valid, and reforms should be piloted and evaluated.

Originality/Value: This is the first multi-predictor study of supervisory support and work-life balance among women conductors in TGSRTC.

Keywords: supervisory support, work-life balance, leave sanction, shift type, management recognition, women conductors, TGSRTC, COR Theory, multi-predictor regression.

INTRODUCTION

Work-life balance (WLB) has become an important issue in human resource management because employees have to manage work responsibilities alongside family and personal obligations. The issue is particularly relevant for women, who often undertake substantial household and caregiving responsibilities in addition to paid employment. These demands may become more difficult to

manage in occupations involving shift work, fixed schedules, long working hours and limited control over working time. Public transportation is one such occupational setting. Bus conductors work according to predetermined routes and schedules and must respond continuously to operational and passenger-related requirements. For women conductors, therefore, the organisation of working time and the support received from supervisors may influence their ability to manage work and family responsibilities.

Supervisors have a direct influence on employees' everyday working conditions. Their responsibilities may include allocating duties, assigning shifts, recommending or sanctioning leave, communicating organisational requirements, responding to employee concerns and recognising work performance. These activities make supervisors an important link between organisational policies and employees' actual work experiences. Talukder and Galang (2021) found a positive relationship between supervisor support and work-life balance and reported that WLB mediated the relationship between supervisor support and employee outcomes. Their findings suggest that supervisory support can provide employees with resources that assist them in dealing with competing work and non-work demands.

Recent studies involving women employees have also reported the relevance of supervisory support. Wani (2023), in research involving female employees in Indian higher education, found a positive relationship between supervisor support and WLB and between WLB and life satisfaction. Uddin et al. (2023), studying working women in the banking sector, similarly reported an association between supervisory support and WLB. These findings are consistent with Conservation of Resources (COR) theory (Hobfoll, 1989), which proposes that individuals seek to acquire and protect valued resources. Support from supervisors may provide social, emotional and organisational resources that help employees manage competing demands. Social Exchange Theory (SET) (Blau, 1964/2017) provides a complementary explanation. When employees receive assistance, consideration and recognition from supervisors and management, they may perceive that the organisation values their contribution and responds fairly to their needs.

Evidence from Indian public transport organisations provides a useful occupational context for examining these relationships. Rajeswari (2014) examined WLB among women conductors of the Andhra Pradesh State Road Transport Corporation (APSRTC) and identified working hours, work responsibilities, family responsibilities, workplace amenities, management support and family support as relevant factors. The study recommended family-friendly policies for women conductors. Vijayalakshmi and Veni (2017) also examined WLB among women bus conductors of APSRTC in Visakhapatnam District. These studies are important because they focused specifically on women conductors, although they did not examine the independent effects of different supervisory practices.

Research involving the Karnataka State Road Transport Corporation (KSRTC) provides further evidence of the difficulties experienced by transport employees in managing work and family roles. George et al. (2018) found that shift work, workload, night duties, social obligations and family circumstances were associated with WLB among KSRTC workers. More recent research has examined women conductors in greater detail. Divya and Kalaiselvi (2024) examined the challenges, including work-life balance, faced by married women conductors of the Kerala State Road Transport Corporation (also abbreviated KSRTC) in the Malabar region, and their relationship with job performance and satisfaction. Such findings indicate that both organisational and family resources are relevant to the work-life experiences of women working in public transportation.

The TSRTC context is particularly relevant to the present research. Vemula (2024) examined WLB among women employees of TSRTC in Hyderabad and reported difficulties associated with working hours, job demands, family responsibilities and organisational support. The study recommended greater organisational attention to WLB among women employees. Earlier research on women conductors of APSRTC, from which TSRTC was formed following the bifurcation of Andhra Pradesh in 2014, is also directly relevant, as it examined occupational problems and WLB in the same organisational system (Rajeswari, 2014; Vijayalakshmi & Veni, 2017). Journalistic investigations have also documented occupational problems among women conductors of TSRTC itself, including early-morning reporting times, extended double duties, limited sanitation facilities en route and difficulty in obtaining leave (Parasa, 2021; Teja, 2019). However, existing research has generally considered WLB and organisational support in broad terms. Limited attention has been given to the specific supervisory practices through which organisational support may influence women's work-life experiences.

Supervisory support may not operate as a single, uniform practice. In the context of public transportation, **supervisory cooperation** reflects the extent to which immediate supervisors understand employees' difficulties and provide assistance when required. Leave sanction is relevant because timely access to leave can enable employees to attend to family and personal responsibilities. Management recognition reflects acknowledgement and appreciation of employees' efforts and performance and may contribute to employees' perception that their work is valued. Shift type, although not a supervisory behaviour, is an important work-scheduling characteristic because the timing of duty can affect employees' availability for family and personal activities. Examining these dimensions separately can therefore provide a clearer understanding of the relationship between workplace practices and WLB.

The present study examines whether supervisory cooperation, leave sanction, management recognition and shift type predict work-life integration (WLI) among 600 women conductors

across 25 TGSRTC depots in Hyderabad. Because duty schedules, routes and leave in this setting are largely determined by the organisation, these practices may affect employees well beyond the workplace. Grounded in COR theory and SET, the study extends research on supervisory support and WLB to a specific occupational group in Indian public transportation.

The remainder of the paper proceeds as follows. Section 0 sets out the theoretical framework grounding the study. Section 0 reviews the relevant literature and identifies the research gap. Section 0 describes the research methodology. Section 0 reports the chi-square analysis of workplace-support dimensions against marital status and spouse employment. Section 0 presents the multi-predictor regression analysis testing the paper's central hypotheses. Section 0 interprets the regression results in detail. Section 0 discusses the findings in light of COR theory and SET, and Section 0 concludes with the study's practical implications.

THEORETICAL FRAMEWORK

Conservation of Resources (COR) theory (Hobfoll, 1989) provides the primary lens. COR posits that individuals strive to retain valued resources: personal (self-efficacy, health), social (supervisor support, relationships) and structural (time, schedule predictability). In the TGSRTC context, each predictor in the model represents a distinct resource dimension: supervisory cooperation and leave sanction address social resources, management recognition addresses motivational resources, and shift type addresses the structural resource of time predictability. When these resources are depleted through unsupportive supervisors, denied leave, unrecognised contributions, or unpredictable shifts, resource loss spirals emerge, undermining WLB (Hobfoll et al., 2018).

Social Exchange Theory (SET) (Blau, 1964/2017) complements COR by framing supervisory support as a reciprocal exchange. When TGSRTC supervisors invest in employees' WLB through leave accommodation, recognition, and schedule consideration, employees reciprocate through positive WLI outcomes. The four-predictor model tested here operationalises this SET exchange across four distinct supervisory and organisational behaviours, enabling a more complete test of the support-WLI relationship than a single-predictor model allows.

Figure 1 presents the conceptual model tested in this study: four supervisory support behaviours, grounded in COR and SET, each hypothesised to independently predict Work-Life Integration.

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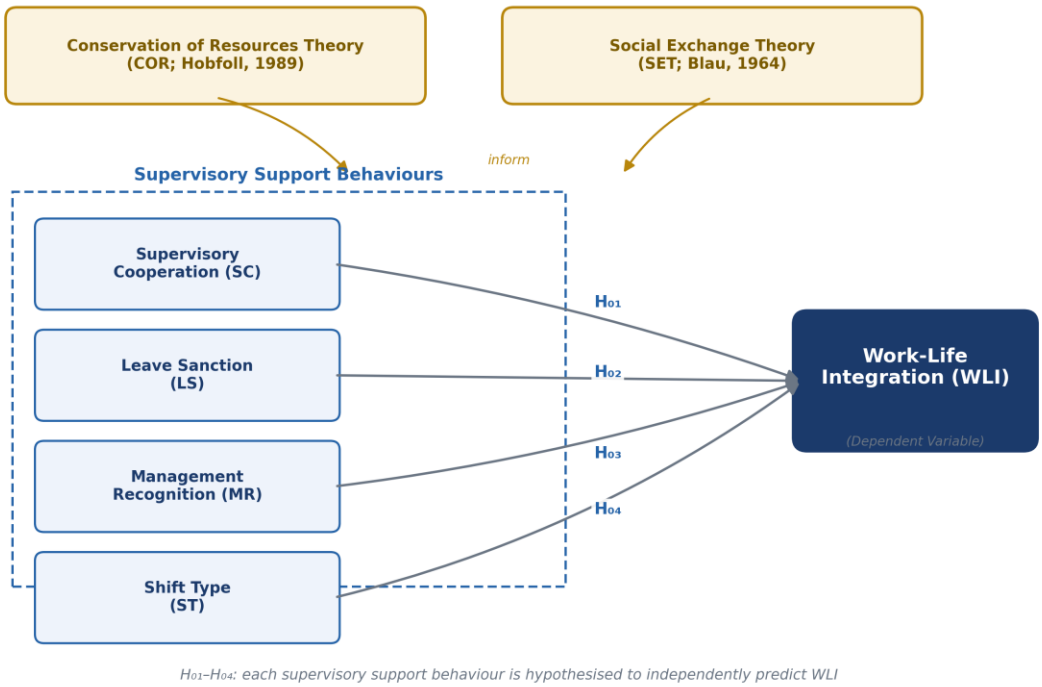

Figure 1: Conceptual Framework of the Hypothesised Model of Supervisory Support and Work-Life Integration

REVIEW OF LITERATURE

Hammer et al. (2009) developed and validated the Family-Supportive Supervisor Behaviors (FSSB) scale, identifying four dimensions: emotional support, instrumental support (responding to employees' day-to-day work–family needs), role modelling, and creative work-family management. They found FSSB to be related to work–family conflict, job satisfaction and turnover intentions over and above general supervisor support, and a subsequent meta-analysis by Kossek et al. (2011) distinguished general from work–family-specific supervisor and organisational support in relation to work–family conflict. Sekhar and Patwardhan (2023) found that supervisor support mediated the relationship between flexible working arrangements and job performance in Indian service firms, while Talukder and Galang (2021) reported that supervisor support was related to employee performance through work-life balance and job and life attitudes among employees in Australia.

The significance of shift scheduling for WLB is well established in transport-sector research. George et al. (2018) found in their KSRTC study that shift work was among the leading factors affecting WLB, while Kecklund and Axelsson (2016) reviewed evidence linking shift work to

insufficient sleep, accidents and adverse health outcomes. In the TGSRTC context, the 82.3% of the 600 women conductors who work morning shifts have more predictable schedules than those on evening, general, special, or all-shift duties, making shift type a theoretically justified predictor of WLI. Management recognition has been identified by Meng et al. (2023) as one of twelve determinants of work-life balance among transport employees in Beijing, and perceived organisational support, to which recognition and rewards contribute, has been linked to higher affective commitment and job satisfaction (Kurtessis et al., 2017).

Au and Ahmed (2016), drawing on COR Theory, demonstrated that superior support and work role stressors together shape work-life experience. Brennan et al. (2024) found, in a three-wave study of Irish public-sector employees, that leader–member exchange was linked to work engagement through psychological safety and job crafting. Mani (2013) and Vijayalakshmi and Veni (2017) document that Indian women professionals, including APSRTC bus conductors, face a dual burden of paid work and family responsibilities, with limited organisational support and recognition among the factors affecting their WLB, making this four-predictor model particularly relevant to the TGSRTC policy context.

Research Gap and Objective

No study has applied a multi-predictor regression model incorporating supervisory cooperation, leave sanction, management recognition, and shift type to test WLI outcomes among women conductors in an Indian public transport corporation. The present study addresses this gap.

Objective: To determine the relative impact of supervisory cooperation, leave sanctioning, management recognition, and shift type on work-life integration among women conductors of TGSRTC, Hyderabad, using a multi-predictor regression model.

Hypotheses

1. H_{01}: Supervisor cooperation has no significant impact on work-life integration among women conductors of TGSRTC, Hyderabad.
2. H_{02}: Leave sanction by supervisor has no significant impact on work-life integration.
3. H_{03}: Management recognition has no significant impact on work-life integration.
4. H_{04}: Shift type has no significant impact on work-life integration among women conductors.

RESEARCH METHODOLOGY

The study employed a quantitative cross-sectional design. The initial fieldwork plan was to collect data from 300 women conductors (12 from each of the 25 depots). During visits to the first four TGSRTC depots, the researcher observed encouraging participation and interest in the study, including cooperation from the supervisors present in those units. In view of this field experience, the planned sample size was increased to 600 women conductors. The enlarged sample was

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allocated across the 25 depots in proportion to each depot's number of women conductors (proportionate stratified random sampling). To allow for non-return, 700 questionnaires were served, and 600 usable responses were obtained, a response rate of 85.7%. The final sample comprised 600 respondents (32.4% of the stated population of 1,850) across all 25 TGSRTC depots in Hyderabad. The response matrix records unequal depot-wise sample counts ranging from 18 to 30 respondents per depot, with 600 respondents in total. The pre-validated 58-item questionnaire achieved Cronbach's α=0.832 (pilot N=100).

The same verified 600-respondent response matrix and questionnaire instrument are also used in a companion paper by the same authors, "Organisational Support and Perceived Work-Life Balance Among Women Bus Conductors in Telangana State Road Transport Corporation (TGSRTC), Hyderabad." That paper addresses a different research objective and uses different analyses: it examines organisational support as a 12-item composite, its reliability and factor structure, its relationship with work-life integration, and its variation across demographic groups. The two papers therefore overlap in respondents and in some variables (for example, marital status and spouse employment), although the analyses reported are different. The present paper independently examines supervisory cooperation, leave sanction, management recognition and shift type as predictors of work-life integration. This disclosure is provided to make the shared dataset transparent and to distinguish the two papers' analytical purposes. The same response matrix is also used in the first author's doctoral thesis, "Work Life Balance of Women Bus Conductors in TGSRTC in Hyderabad City" (Department of Business Management, Osmania University), which reports the full set of analyses, including the depot-wise and qualitative analyses that neither paper undertakes.

The four predictors were measured using single items from the Workplace Support (WPS) section, all coded on 5-point scales so that higher scores indicate a more favourable response: Supervisor Cooperation (Q.15), Leave Sanction (Q.16; 5 = leave mostly sanctioned), Management Recognition (Q.19), and Shift Type (Q.7, recoded: 1 = Morning shift, 0 = Other, i.e., evening, general, special or all-shift duty). The dependent variable, Work-Life Integration (WLI), was operationalised as the mean of six satisfaction items (Q.46–Q.51) covering time availability, division of time, contribution, ability to balance, managing home-work demands, and developmental opportunities (Cronbach's α = 0.704). The three supervisory predictors are single-item measures and are therefore more susceptible to random measurement error, which may attenuate their estimated regression coefficients. A sensitivity analysis (Section 0) therefore replaces Management Recognition with a two-item composite. While the achieved sample comprised 600 women conductors, the effective sample size varies slightly across analyses because of item-level missing responses rather than unit non-response. Descriptive and chi-square

analyses use the valid responses for each variable (N = 598–600 for marital status; N = 526–528 for spouse employment, which is not applicable to every respondent). Correlation and regression analyses require simultaneous non-missing values on all five variables and therefore use listwise-complete cases, yielding a working sample of N=599. This N is reported alongside each table and result throughout the paper.

CHI-SQUARE ANALYSIS

This section tests whether the workplace-support dimensions are significantly associated with respondents' marital status and spouse-employment status. The chi-square test of independence is used because both the workplace-support ratings and these demographic variables are treated as categorical rather than continuous, which rules out correlation or regression here.

Chi-square values in this paper were computed using Python (scipy.stats.chi2_contingency) on the verified 600-respondent response matrix (Response_Matrix_600.xlsx), with Cramér's V reported as an effect-size measure.

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Table 1 reports the associations between respondents' marital status and spouse-employment status and each workplace-support dimension, including effect sizes.

Table 1: Chi-Square Values for Marital Status (MS) and Spouse Employment (SE) × WPS Dimensions

WPS Dimension	χ^2 (MS)	df	p	V	χ^2 (SE)	df	p	V
Colleague Cooperation	3.205	8	0.921	0.052	4.640	4	0.326	0.094
Supervisor Cooperation	**12.757**	6	**0.047**	**0.103**	2.274	3	0.518	0.066
Privilege Leave Sanction	10.152	8	0.255	0.092	5.423	4	0.247	0.101
Short Break Facilities	10.082	8	0.259	0.092	4.227	4	0.376	0.090
Interchange Arrangements	4.706	8	0.789	0.063	2.537	4	0.638	0.069
Management Recognition	5.950	8	0.653	0.070	5.463	4	0.243	0.102
Management Listening	8.816	8	0.358	0.086	1.341	4	0.854	0.050
Technology Helpfulness	8.707	8	0.368	0.085	7.472	4	0.113	0.119
Technology Sufficiency	5.646	8	0.687	0.069	3.693	4	0.449	0.084
WLB Measures Satisfaction	3.400	8	0.907	0.053	2.906	4	0.574	0.074
Medical Facility Satisfaction	6.138	8	0.632	0.072	2.711	4	0.607	0.072
Medical Access Satisfaction	11.679	8	0.166	0.099	1.203	4	0.878	0.048

Source: Computed from the verified 600-respondent response matrix (Response_Matrix_600.xlsx) using Python (SciPy chi2_contingency, no continuity correction). Valid N = 598–600 per dimension for marital status (married, n = 529; unmarried, n = 24; single parent, n = 47) and

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526–528 for spouse employment (employed, not employed). In the marital-status columns of Table 1, 8.3–26.7% of cells have expected counts below 5 (minimum 3.1), reflecting the small unmarried and single-parent groups, so these results, including the single significant association, should be treated as indicative only. No spouse-employment cell has an expected count below 5. Shaded cells in Table 1 mark the only association significant at the 5% level (Marital status × Supervisor Cooperation, p=0.047).

Only one of the 24 chi-square tests reaches the 5% level, and Cramér's V ranges only from 0.048 to 0.119 (negligible to small). With 24 tests, roughly one significant result is expected by chance at $\alpha = 0.05$, and the single significant association would not survive a Bonferroni correction (adjusted $\alpha \approx 0.002$). Accordingly, no claim is made that marital status or spouse employment shapes perceptions of any workplace-support dimension in this sample. Spouse employment is also unrelated to overall perceived management support, measured as the mean of Q.15–Q.20, Q.24 and Q.25 (independent-samples t-test: M=3.06 vs 3.10, t=−0.572, p=0.568).

MULTI-PREDICTOR REGRESSION ANALYSIS

Building on the chi-square results above, multiple linear regression is used to test the paper's central hypotheses. It was chosen because it estimates each predictor's independent effect on WLI while statistically controlling for the other three, a question that separate bivariate correlations cannot answer.

Following the single-predictor baseline model (r=0.040, R^2=0.002, F=0.937, p=0.333), a four-predictor regression model was developed incorporating supervisory cooperation (SC), leave sanction (LS), management recognition (MR), and shift type (ST) as predictors of work-life integration (WLI).

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Descriptive Statistics and Correlations

Table 2 describes the central tendency and dispersion of the dependent variable and the four predictors, with valid sample sizes shown for each measure.

Table 2: Descriptive Statistics

Variable	Mean (M)	Std. Deviation	Source
Work-Life Integration (WLI, DV)	3.262	0.792	Q.46–Q.51 composite (N=600)
Supervisor Cooperation (SC)	3.583	1.068	Q.15 (N=600)
Leave Sanction (LS)	3.053	1.308	Q.16 (N=600)
Management Recognition (MR)	3.037	1.332	Q.19 (N=599)
Shift Type (1=Morning, 0=Other)	0.823	0.382	Q.7 (recoded, N=600)

Note: N = 599–600, and item-level missing responses explain the difference.

Table 3 shows the bivariate correlations among work-life integration and the four explanatory variables.

Table 3: Correlation Matrix of Predictors and WLI (N = 599, listwise-complete)

Variable	WLI	SC	LS	MR	ST
Work-Life Integration (WLI)	1.000	0.040	−0.017	0.008	0.004
Supervisor Cooperation (SC)	0.040	1.000	**0.275****	**0.293****	0.002
Leave Sanction (LS)	−0.017	**0.275****	1.000	**0.197****	−0.054
Management Recognition (MR)	0.008	**0.293****	**0.197****	1.000	0.010
Shift Type (ST)	0.004	0.002	−0.054	0.010	1.000

*** p<0.01 (two-tailed). Shaded cells are significant. No predictor is significantly correlated with WLI at the bivariate level. All correlations were computed directly from the dataset (N=599 listwise-complete cases). Source: Response_Matrix_600.xlsx.*

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Model 2: Four-Predictor Regression (SC + LS + MR + Shift Type)

Table 4 summarises the overall fit of the four-predictor regression model.

Table 4: Model 2 Summary for the Four-Predictor Model (N=599)

Model	R	R^2	Adj. R^2	Std. Error	F	Sig.	ΔR^2
1 (SC only)	0.040	0.002	−0.000	0.791	0.937	0.333	—
2 (SC+LS+MR+ST)	0.049	0.002	−0.004	0.793	0.358	0.839	+0.001

Model 2 values were computed via multiple OLS regression on the dataset (N=599 listwise-complete cases). ΔR^2=+0.001 is negligible: adding LS, MR and ST to the SC-only model does not improve the explanation of WLI, and the four-predictor model is not statistically significant. Source: Response_Matrix_600.xlsx. The ANOVA decomposition is: regression SS = 0.899 (df = 4, MS = 0.225), residual SS = 373.419 (df = 594, MS = 0.629) and total SS = 374.318 (df = 598); F = 0.358, p = 0.839.

Table 5 reports the unstandardised and standardised coefficients and the significance tests for each predictor.

Table 5: Regression Coefficients for Model 2 (N = 599)

Predictor	B (Unstd.)	Std. Error	β (Std.)	t	p-value	Decision on H_0
(Constant)	3.185	0.148	—	21.589	<0.001	—
Supervisor Cooperation (SC)	0.035	0.033	0.048	1.087	0.278	Retain H_{01} (not significant)
Leave Sanction (LS)	−0.018	0.026	−0.030	−0.693	0.489	Retain H_{02} (not significant)
Management Recognition (MR)	−0.000	0.026	−0.000	−0.008	0.994	Retain H_{03} (not significant)
Shift Type (Morning=1)	0.004	0.085	0.002	0.048	0.962	Retain H_{04} (not significant)

Computed via OLS regression directly on the dataset (N=599 listwise-complete cases). Source: Response_Matrix_600.xlsx.

Regression diagnostics and robustness. Variance inflation factors are 1.16 (SC), 1.10 (LS), 1.11 (MR) and 1.00 (ST), so multicollinearity is not a concern despite the moderate intercorrelations among the supervisory ratings. The Shapiro–Wilk test rejects normality of the residuals (W=0.967,

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p<0.001), as is typical of a bounded ordinal composite, although with N=599, the coefficient tests are robust to moderate non-normality. The Breusch–Pagan test finds no evidence of heteroskedasticity (LM=4.554, p=0.336), and heteroskedasticity-robust (HC3) standard errors lead to the same conclusions as the classical estimates (robust p = 0.287 for SC, 0.518 for LS, 0.994 for MR and 0.960 for ST). Because SC, LS and MR are single items, Management Recognition was also replaced by a two-item composite of Q.19 (recognition) and Q.20 (management's willingness to listen). This leaves the results unchanged (N=600, because the two-item composite is averaged over available items; R^2=0.004; MR composite B=−0.032, p=0.351, HC3 p=0.352; no other coefficient significant). The two items are only weakly related (r=0.217, α=0.357), so this check shows that the null result is not specific to one item rather than offering a validated alternative scale.

Hypothesis Testing Summary

None of the four null hypotheses is rejected at the 5% level of significance. H_{01} (Supervisor Cooperation), H_{02} (Leave Sanction), H_{03} (Management Recognition) and H_{04} (Shift Type) are all retained (all p>0.27, classical and HC3), and the model as a whole is not significant (F(4, 594)=0.358, p=0.839). The four predictors together explain 0.2% of the variance in work-life integration. With N=599, the model had about 80% power to detect an R^2 of 0.020 or larger, so any true effect is smaller than that.

INTERPRETATION OF REGRESSION RESULTS

The four-predictor model does not improve on the single-predictor baseline, and neither model explains variance in WLI. R^2 is 0.002 for Supervisor Cooperation alone (F=0.937, p=0.333) and 0.002 for the four-predictor model (Adjusted R^2=−0.004; ΔR^2=+0.001). The overall model is not statistically significant (F=0.358, df=4,594, p=0.839, N=599). The null result is not an artefact of estimation: multicollinearity is low, robust standard errors give the same conclusions, and statistical power does not explain it, since an R^2 of about 0.020 would have been detected with 80% probability.

Supervisor Cooperation (SC) is not a significant independent predictor of WLI (β=0.048, p=0.278), and its bivariate correlation with WLI is negligible (r=0.040, p=0.333). SC is positively and significantly correlated with Management Recognition (r=0.293) and Leave Sanction (r=0.275), indicating that conductors who rate one supervisory behaviour favourably tend to rate the others favourably. However, this shared perception of supervisors does not translate into higher work-life integration.

Leave Sanction (LS) is likewise not a significant independent predictor (β=−0.030, p=0.489; HC3 p=0.518), and its bivariate correlation with WLI is −0.017. This does not mean that leave is unimportant to the conductors: 37.2% rate leave sanctioning unfavourably, and in the open-ended

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responses analysed in the first author's doctoral thesis leave sanctioning is the most frequently raised substantive concern. A plausible reading is that whether a particular request for leave was granted is a specific, episodic experience that does not covary across respondents with a general evaluation of work-life satisfaction.

Shift Type (ST) is not a significant independent predictor of WLI in this model (β=0.002, p=0.962), despite the theoretical expectation drawn from George et al.'s (2018) KSRTC finding that shift work is among the leading factors affecting WLB. The bivariate correlation between ST and WLI is also negligible (r=0.004, ns), and a one-way comparison of WLI across the five shift categories finds no difference (F=0.150, p=0.963). Because only 17.7% of respondents (106 of 600) work shifts other than the morning shift, the shift-type coefficient is estimated with lower precision, but the estimate is essentially zero.

Management Recognition (MR) has a coefficient of effectively zero (β=−0.000, p=0.994) and a negligible bivariate correlation with WLI (r=0.008). The same is true of the two-item composite of recognition and management listening (B=−0.032, p=0.351). In this dataset, therefore, visible recognition of good performance by management does not explain differences in work-life integration either, and none of the four behaviours emerges as the primary organisational lever on WLI.

DISCUSSION

The four-predictor model offers a more complete test of the supervisor–WLI relationship than a single-predictor model, but it does not support the theoretical expectation that specific supervisory behaviours independently predict work-life integration. Three points emerge.

First, the three supervisory ratings are positively intercorrelated (r=0.20 to 0.29), as the resource caravan corollary of COR theory would lead one to expect, since resources tend to occur and travel together rather than in isolation . However, neither individually nor jointly do the supervisory and scheduling resources predict work-life integration, so the COR expectation that such social and structural resources convert into higher WLI receives no support at this level of measurement. A plausible reading is that, in a workforce whose personal resources are thin (88.9% have no domestic help, 60.2% describe their household as low or poor income, and every respondent reports between one and four dependent elders, with none recording no dependent elders), satisfaction with work-life balance is governed mainly by household and commuting circumstances that the supervisory predictors do not capture. This is an interpretation, not a tested mechanism.(Hobfoll et al., 2018)

Second, the reciprocity logic of Social Exchange Theory (Blau, 1964/2017) predicts that favourable treatment by supervisors and management is returned in more positive outcomes. In this sample that link is not visible: neither the tangible supports (Supervisor Cooperation, Leave

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Sanction) nor the more symbolic one (Management Recognition) is associated with WLI. Supervisory support may operate on outcomes that were not measured here, such as commitment, stress or intention to stay, or it may be experienced as specific and episodic whereas the outcome is a general evaluation. These possibilities cannot be separated with the present data.

Third, Shift Type did not emerge as a significant predictor in this sample, a departure from the expectation drawn from George et al.'s (2018) KSRTC finding. Because 82.3% of the 600 respondents work the morning shift, the comparison group is small and the shift-type estimate is imprecise, although it is essentially zero. This should be read as weak evidence rather than proof that shift assignment is unimportant to WLI. One exploratory observation, outside the four-predictor model, merits follow-up: the 32 conductors who report night-out duty have a lower mean WLI than the others (M=2.72 vs 3.28; Welch t=−3.57, p=0.001), although this subgroup is small.

Given that the four-predictor model explains 0.2% of the variance in WLI, the findings are best read as an absence of detectable association, not as evidence that supervisory behaviour is irrelevant. Three cautions apply. First, the three supervisory predictors are single items with limited reliability. Second, responses on most items are spread almost evenly across the five categories, which weakens any association. Third, the design is cross-sectional. Respondents' concerns about leave sanction and management's willingness to listen (unfavourable ratings of 37.2% and 39.2% respectively, equal to the favourable share for management listening and about three points below it for leave sanction, 40.3% favourable) remain legitimate management issues in their own right, whether or not they predict the satisfaction composite.

CONCLUSIONS

This study provides the first multi-predictor empirical test of supervisory support and WLB among women conductors of TGSRTC, Hyderabad. The four-predictor model is not statistically significant ($R^2 = 0.002$, $p = 0.839$), none of the four predictors has a significant independent effect, and all four null hypotheses are retained; the result holds under heteroskedasticity-robust standard errors and an alternative recognition measure. Specific supervisory behaviours therefore do not explain differences in work-life integration among these employees.

Of the 24 chi-square tests of the workplace-support dimensions against marital status and spouse employment, only one is significant at the 5% level (marital status × Supervisor Cooperation, $p = 0.047$), about what chance alone would produce among 24 tests. The workplace-support dimensions therefore do not differ meaningfully by marital status or spouse employment.

Based on this evidence, the study does not support singling out any one supervisory behaviour as the primary lever on WLI. TGSRTC should address the specific concerns that respondents' own ratings corroborate, namely leave sanctioning and management's responsiveness, and the facility-related items on which unfavourable ratings outnumber favourable ones (short-break facilities,

40.4% unfavourable, and interchange arrangements, 39.0%, with technology sufficiency effectively tied at 39.3% vs 39.2%). It should, however, pilot and evaluate any recognition, leave-accommodation or scheduling reform with before-and-after measurement rather than assume that it will raise work-life integration. Future research should use validated multi-item supervisory scales, collect depot and supervisor identifiers to permit multilevel analysis, measure household workload and commuting burden directly, and examine mediation and outcomes other than work-life satisfaction.

ETHICAL STATEMENT

Ethical clearance for this study followed the procedures of Osmania University's Department of Business Management Research Committee. The Research Design Seminar was certified on 20.01.2024 by the Head of Department and Chairman, Board of Studies (Lr. No. 06/BoS/DBM/OU/2024), with the countersignature of the Research Supervisor, Prof. Y. Jahangir. TGSRTC granted formal permission for data collection under Lr. No. E4/613(1)/2024-ED: GHZ, dated 30.01.2024. All 600 participating conductors gave informed consent prior to completing the questionnaire, on a voluntary basis. Providing a name was optional. Names given by some respondents were kept confidential, were removed from the dataset before analysis, and are not reported.

CONFLICT OF INTEREST

No conflict of interest is declared by the authors. The study was carried out independently of any commercial, financial, or personal relationship that might have shaped the results reported here.

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AUTHOR CONTRIBUTIONS

Ravindar Mukkala led the conceptualisation, data curation, formal analysis, investigation, and methodology design, and drafted the original manuscript. Prof. Y. Jahangir provided supervision and conceptual input, validated the analysis, and reviewed and edited the manuscript.

DATA AND COMPUTATION NOTE

All statistics in this paper (Tables 1–5) were computed directly from the response-level dataset (600 respondents × 58 items) using Python (pandas, SciPy and statsmodels), with Likert responses coded 1–5 (higher = more favourable). Regression and correlation analyses use listwise-complete cases (N = 599); chi-square analyses use the valid responses for each item. The dataset is shared with the companion paper identified in the Research Methodology section.

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