

RUNNING HEAD: JOB SATISFACTION AND ORGANISATIONAL COMMITMENT: A
MULTILEVEL ANALYSIS

What happens in the work group matters: A multilevel analysis of job satisfaction and
organisational commitment



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JOB SATISFACTION AND ORGANISATIONAL COMMITMENT: A MULTILEVEL ANALYSIS

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Declaration

This dissertation contains no material which has been accepted for the award of any other degree or diploma in any University, and, to the best of my knowledge, contains no materials previously published except where due reference is made.

I give permission for the digital version of my dissertation to be made available on the web, via the University's digital research repository, the Library Search and also through web search engines, unless permission has been granted by the School to restrict access for a period of time.

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Statement of Contribution

In creating and writing this thesis, [REDACTED] and I collaborated to generate the overarching aims of the study, research questions of interest, and to design the appropriate methodology. I conducted the literature search and ethics application. I was responsible for all data collection and data analysis using SPSS. [REDACTED] [REDACTED]. I wrote the thesis with my supervisors providing constructive and general feedback.

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Abstract

The benefits of high job satisfaction (JS) and organisational commitment (OC) are widespread for both employees and organisations. The reciprocal, time-lagged relationship between JS and OC has been investigated meta-analytically using two-wave individual-level panel data, however, the temporal ordering of JS and OC across three-waves requires more investigation. Further, understanding the hierarchical structure of effects of JS and OC within and across organisational levels on individual perceptions using cross-lagged multilevel modelling has not been widely studied. Employees at an Australian retail and manufacturing organisation were surveyed annually from 2019 (T1) to 2021 (T3) to assess their JS and OC. Employees ($N=129$) were nested within their work groups ($n=24$). The model confirmed the positive effects of time lags on the relationship between JS and OC, supporting existing evidence that the reciprocal relationship evolves and changes over time. The individual lagged effect of OC on JS was stronger initially ($T1 \rightarrow T2$), while later the inverse was observed, with a stronger cross-lagged effect of JS on OC ($T2 \rightarrow T3$). Multilevel cross-lagged panel modelling confirmed unique reciprocal group-level effects at T3. The initial model suggests that an individual's JS and OC are influenced by membership of a work group over time – the underlying JS and OC of the individual will promote the development of emergent group perceptions of JS and OC, with reciprocal impacts. No changes in perceptions of JS and OC during a period of social and economic instability (Covid-19 pandemic) were observed. The findings highlight the importance of including three-wave cross-lagged panel models and multilevel study design in future analyses of JS and OC. Implications for organisational development, management and leadership are discussed, and limitations and possible extensions are considered.

Keywords: Job satisfaction, organisational commitment, nested work groups, cross-lagged panel modelling, three-wave multilevel data

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What happens in the work group matters: A multilevel analysis of job satisfaction and organisational commitment

Understanding and improving job satisfaction (JS) and organisational commitment (OC) is a primary concern for ongoing organisational success. While the reciprocal relationship between JS and OC has been explored (Huang & Hsiao, 2007; Lance, 1991; Mathieu, 1991), the direction and specifics of the relationship remain widely contested (Saridakis et al., 2018; Xu et al., 2023). There is evidence that individuals develop shared perceptions of JS and OC within their work groups, influenced by their leaders (Chen et al., 2007; Lok et al., 2005). Understanding the direct effects on individual experiences of JS and OC as influenced by shared perceptions of their work group can inform theoretical understanding to improve management and leadership practice, and organisational development targeted at enhancing JS and OC more broadly. Despite growing understanding of the influence of group membership on individuals' perceptions requiring multilevel analysis to interpret the hierarchical structure of data and effects within organisations, JS and OC have typically only been assessed at the individual level (Aguinis et al., 2013; Chen et al., 2007; Humphrey & LeBreton, 2019). There appears to be few, if any, studies that have examined the three-wave individual-level cross-lagged relationship between JS and OC, and none have taken a multilevel, multi-wave longitudinal approach. This study addresses theoretical gaps in the JS and OC literature to understand how individual relationships change over time and how shared perceptions within work groups influence individual experiences of JS and OC, using cross-lagged panel modelling (CLPM; Finkel, 1995).

Job satisfaction, organisational commitment, and productivity

Recent approaches define JS as a pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences (Nelson & Quick, 2013). JS can be used as a broad assessment of an employee's attitudes of overall acceptance, contentment, and

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enjoyment in their work (Lee-Kelley et al., 2007). JS is typically measured by capturing employees' perceptions of their satisfaction with their job overall, their level of pay, opportunities for career development, and general working conditions, among other aspects (Gregson, 1990; Roznowski, 1989; Smith, 1969).

OC is the degree to which employees adopt organisational values when identifying problems and effective solutions, and more broadly when fulfilling their job responsibilities (Eleswed & Mohammed, 2013; Meyer & Allen, 1991). OC can be considered a measure of loyalty felt by an employee to their organisation (Mueller et al., 1992; Price, 1997). OC is typically measured by capturing employees' perceptions of their willingness to go 'above and beyond' in their role; their sense of belonging within - and contribution to - the organisation; willingness to recommend the organisation as a workplace to others; and their intention to leave or stay with the organisation (Allen & Meyer, 1990; Cook and Wall, 1980; Mowday et al., 1979). Individuals' JS and OC are central to work performance and workplace psychological health (Bowling et al., 2010; Lumley et al., 2011; Schleicher et al. 2004).

Social exchange theory (Blau, 1960) suggests that in interdependent relationships, interactions between parties create norms and expectations of reciprocity (Cropanzano & Mitchell, 2005; Huang et al., 2016). Employees are likely to respond accordingly to how they perceive they are being treated by their organisation (Huang et al., 2016; Mearns et al., 2010). Employees that perceive their organisation as supportive may in turn feel a sense of obligation to act favourably towards the organisation (Dejoy et al., 2004). Employees who are satisfied with their jobs tend to exhibit higher levels of commitment to their organisations (Meyer & Allen, 1991). In line with social exchange theory, this view of the JS-OC relationship is grounded in the idea that satisfied employees who perceive their organisation and leadership as supportive are more likely to feel invested in the organisation's success, and are more likely to stay with the organisation (Cho et al., 2009; Lumley et al., 2011).

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A similar effect may be observed in employees that perceive their treatment and conditions less favourably. Low JS can stem from various factors, such as inadequate compensation, limited career growth opportunities, poor working conditions, and a lack of recognition (Harter et al., 2002). Dissatisfied employees are more likely to become disengaged, resulting in decreased motivation, reduced job performance, and a decline in overall productivity (Breevaart et al., 2014). Low levels of OC can arise when employees perceive a lack of support, ineffective communication, and incongruence between personal values and organisational goals (Meyer & Allen, 1991). This can lead to higher absenteeism and decreased job tenure, which contribute to staff turnover (O'Reilly & Chatman, 1986). JS and OC each contribute independently to the prediction of staff turnover (Arnold & Feldman, 1982; Tett & Meyer, 1993). Staff turnover has substantial financial and operational implications for organisations - the costs associated with recruiting, hiring, and training new employees are considerable (Allen et al., 2010). Moreover, frequent turnover disrupts team dynamics, decreases institutional knowledge, and increases the workload for remaining employees, negatively impacting productivity (Lee & Mitchell, 1994). As well as contributing to increased turnover and the associated financial, performance and cultural impacts, low JS and OC predict reduced job performance and organisational productivity (Allen et al., 2010; Breevaart et al., 2014; Eisenberger et al., 2001).

Temporal precedence and causal ordering

The temporal precedence of JS in relation to OC remains contested (Cooper-Hakim & Viswesvaran, 2005; Mathieu & Zajac, 1990; Saridakis et al., 2018; Xu et al., 2023). The relationship between JS and OC has been researched extensively (e.g. Martin & Bennett, 1996; Mathieu & Zajac, 1990; Meyer et al., 2002; Morrow, 2011), and while the existence of a link between JS and OC is supported, evidence remains inconclusive about the direction of the relationship (Xu et al., 2023). A broad bank of research supports the hypothesis that JS

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predicts OC (Angle & Perry, 1983; Stevens et al., 1978; Tsai & Huang, 2008; Valaei & Rezaei, 2016; Williams & Hazer, 1986). An alternate view suggests that the OC is an antecedent to JS (Bateman & Strasser, 1984; Curry et al., 1986; Price & Mueller, 1981; Vandenberg & Lance, 1992).

Some evidence suggests that weak OC may contribute to employee burnout over time. As posited by the Conservation of Resources theory (Hobfoll, 1989), employees who are dissatisfied at work may feel cognitive and emotional resource loss leading to efforts to retain resources, which may reduce their level of OC or the capacity to perform ‘over and above’ general work tasks. Alternatively, there may be a reciprocal relationship where employees who are uncommitted to work may lose additional resources including social support, rewards or autonomy, leading to depletion of energy and general dissatisfaction at work. This suggests a reversed association between OC and JS.

Four theoretical models have contested the causal ordering (Currivan, 1999; Vandenberg & Lance, 1992; Xu et al., 2023). Affective attachment theory proposes that JS forms before OC, and thus causes OC (Lawler, 1992). Specifically, with a micro-orientation, this theory proposes that JS varies instantaneously due to changing work experiences, and consequently forms soon after organisational entry. In contrast, due to its macro-orientation, the theory posits that OC develops gradually, after one acquires a firm understanding of organisational cultures, values, and the implications of maintaining organisational membership. Cognitive dissonance theory (Festinger, 1962) proposes that OC initiates rationalising processes through which employees adjust JS levels to be consistent with OC levels, to reduce cognitive dissonance (Chye Koh & Boo, 2004; Vandenberg & Lance, 1992). Reciprocation theory draws upon both affective attachment and cognitive dissonance to suggest that JS and OC reciprocate one another (Mottaz, 1987; Xu et al., 2023). Shared antecedents theory posits that OC and JS are indicators of a higher order factor (e.g. negative

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emotionality) (Harrison et al., 2006; Thoresen et al., 2003) which explains the relationship between JS and OC (and therefore, that there is no causal relationship) (Currivan, 1999).

Xu et al.'s (2023) meta-analysis found that time plays a significant role in both the ordering and the time-lagged effects of both JS and OC. Their analysis showed that the ordering is neither direct nor simple, and contextual variables will dictate how JS and OC relate, present and evolve within an organisation. Further, their analyses confirmed the moderating effects of time lags and the timing of the investigation on the ordering of JS and OC: lagged effects of both JS and OC are likely to be more pronounced initially, and fade over time, as employees adapt and habituate to the organisational environment and contextual factors (Xu et al., 2023).

Nested work groups

Organisational structures often involve various levels of work groups, and these nested groups can influence how JS and OC develop. Group-level factors such as: leadership, management and communication style; remote or distributed work; external client interactions; and team-based or independent work, introduce unique challenges for maintaining JS and OC within work units, groups and teams (Golden et al., 2008; Korek et al., 2010). Contextual factors, particularly leadership and management practices, play an important role in shaping the JS-OC relationship within work groups (Ilies et al., 2007; Qing et al., 2020). Leadership has a direct relationship with JS; leadership behaviour predicts the JS of subordinates (Berson & Linton, 2005; Tsai, 2011). Transformational leadership is often linked to higher JS and OC due to its ability to inspire and engage employees (Breevaart et al., 2014; Korek et al., 2010).

If group perceptions of JS and OC are shown to directly impact the individual perceptions of its members, organisations can adopt informed strategies targeted at nested work groups to enhance the organisational climate and achieve an effective group dynamic,

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both of which underpin perceptions of JS and OC (Lok et al., 2005; Nielsen et al., 2008).

Addressing these gaps can provide a more comprehensive understanding of the intricate group dynamics that shape the relationship between JS, OC, and the broader organisational context.

The importance of multilevel, longitudinal analyses

Multilevel research uses statistical analysis to aggregate individual perceptions to represent higher-level collectives (Aguinis et al., 2013; Bliese, 2000; Chan, 1998; Mathieu et al., 2012; Mathieu & Chen, 2011). Multilevel modelling allows for an understanding of the key constructs across levels within a theoretical system, to understand whether relationships between lower-level factors change as a function of higher-level variables (Aguinis et al., 2013; Kozlowski & Klein, 2000; Probst, 2010). There remains a need for a more nuanced understanding of the group-level mechanisms that mediate or moderate the relationship between JS and OC. Previous studies have highlighted the need for hierarchical linear modelling to enable analysis of cross-level relations, dependent on individual data being nested within groups (Liao et al., 2009; Raudenbush & Bryk, 2002).

Xu et al.'s (2023) meta-analysis found that the relationship between JS and OC is influenced by other factors, and the relationship is nuanced and complex. Many studies included in that meta-analysis consisted of two-wave data. Thus, there remains a need to assess how the JS-OC relationship changes over time: two-wave data does not allow for testing nonlinear change over time (Weigl et al., 2010). Data consisting of three (or more) waves may provide a greater breadth of insight into time-related changes in the relationship between JS and OC, and therefore complement and expand the findings of Xu et al. (2023).

Raudenbush and Bryk (2002) outline the importance of including a nested-group structure to account for the myriad shared (and distinct) values within and between groups in a hierarchical or multilevel environment. Importantly, multilevel analysis may address some

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of the key moderators (such as nested-group membership) of the relationship not previously analysed with longitudinal data. Specifically, multi-wave, multilevel analysis may provide an understanding of the contextual factors of different work environments within the same organisation; not only whether differences are present within nested work groups, but also how group membership influences individual experience over time. While causation can only be postulated when using employees from organisations in “real world” settings (i.e. experimental design is neither feasible nor ethical in such settings), establishing an understanding of the role that group membership plays may elucidate the importance of including this ‘middle’ or third layer, in between the individual and organisational level, in future longitudinal analyses of JS and OC.

Time lag

Time is a crucial factor in determining causal inferences (Mitchell & James, 2001). Cross-lagged techniques can investigate causal precedence, without experimental manipulation. Cross-lagged approaches examine predominant cause-effect direction(s) – they can inform temporal precedence, but they are not able to infer definitive causation (Anderson & Kida, 1982). By investigating the correlations between variables at a minimum of two timepoints, the strength of associations between variables across time points can inform causal ordering (Lawler & Suttle, 1973). In its most simplistic form, a cross-lagged panel may consist of two variables (X, Y) and two timepoints (T1, T2). A standard model of this 2x2 configuration presents six potential correlations. The relationships within variables and within time points are important, but it is the cross-lagged relationships that can inform temporal precedence – by assessing the strength of the effect of X at T1 on Y at T2, and conversely, the effect of Y at T1 on X at T2 (Anderson & Kida, 1982).

With short or no time lags, causal effects may not have sufficient time to occur; with long time lags, the effects may be observed at a diminished or unrepresentative point. Xu et

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al. (2023) showed that specific time-related changes occur in the JS-OC relationship, and that the employee experience of JS and OC changes as they habituate within a work environment (i.e. they become familiar with and accustomed to the organisation and/or work group). A key limitation of many studies used in that meta-analysis was the cross-sectional data and short-term reporting periods, typically of six months or less (Xu et al., 2023). There is a gap in existing literature of repeated measures over extended periods, to disentangle how the JS-OC relationship develops over longer periods. How employee experiences evolve and change over years, rather than months, can provide a more comprehensive understanding of the relationship between JS and OC within nested work groups. Two-wave data does not allow for assessment of nonlinear change over time: data with three or more waves with reporting periods across multiple years may elucidate findings of greater practical value.

Research aims

This study aims to assess the relationship between JS and OC, to understand the temporal precedence and causal ordering; how the constructs influence each other over time; and how JS and OC interact and change within nested work groups. Thus, the following hypotheses emerged:

Hypothesis 1: JS has a positive time-lagged effect on OC.

Hypothesis 2: OC has a positive time-lagged effect on JS.

Changes during the Covid-19 pandemic

During periods of economic downturn or instability, the relationship between JS and OC may remain consistent, while the perceptions of both may increase at the overarching level (Hsu, 2009). Bianchi et al. (2023) suggests that JS may increase during such periods, and that JS is positively correlated with a scarcity of alternative jobs and immediate employment options. Such descriptions can broadly describe the economic and employment environment in Australia during the first two years of the Covid-19 pandemic (2020 and

2021). There is consensus that JS is directly impacted by situational factors within organisations; however, Bianchi et al. (2023) suggest that external factors and conditions outside of the workplace also play a key role in how people think about and evaluate their jobs. Data was captured in a three-year period, 2019-2021 inclusive. As participants included in the final analyses remained employed with the organisation across the three-year period, all participants retained stable employment during a time of social and economic volatility. Considering these contextual factors, a final hypothesis emerged:

Hypothesis 3: JS and OC will be higher in 2020 and 2021 compared to 2019.

Method

Participants

Employees at a manufacturing and retail organisation in Australia undertook an annual “Staff Satisfaction Survey” in the period 2019 (T1), 2020 (T2) and 2021 (T3). The sample size from each year ranged from 318 to 367 (refer to Table 2), from an overall employee sample of more than 450. Exact figures of the total employee sample were not able to be collected due to several reasons including the seasonal nature of some casual retail staff (total employee numbers vary throughout the year) and fluctuations in 2020 and 2021 due to Covid-19. Large groups of staff remaining employed but not actively working during various periods of restrictions, lockdowns and operational adjustments required by pandemic conditions differing between states where this organisation operates. Nonetheless, the response rate remained at or above 65% of the total workforce at each timepoint.

At T1, participants from the organisation were employed across 24 distinct work groups in three departments; four work groups in Manufacturing, 19 work groups in Retail, and one Head Office work group. New work groups (sites) opened in 2020 and 2021 as the organisation continued to expand its operations; responses from these work sites were excluded given their absence from the 2019 survey.

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Table 1

Characteristics of the final sample used for the CLPM (as recorded at T1) and comparison with the total T1 sample

Age	<i>n</i>	%	(% Total T1 Sample)
15-21 years	10	7.8	14.4
22-30 years	19	14.7	25.3
31-39 years	23	17.8	17.9
40-48 years	34	26.4	17.0
49-57 years	28	21.7	15.4
58 years +	15	11.6	9.9
Gender	<i>n</i>	%	(% of Total T1 Sample)
Male	34	26.4	24.5
Female	92	71.3	70.4
Other	3	1.2	3.1
Employment tenure with organisation	<i>n</i>	%	(% of Total T1 Sample)
Less than one year	27	20.9	23.8
1-2 years	20	15.5	21.0
3-5 years	21	16.3	23.2
6-9 years	24	18.6	14.7
10-14 years	25	19.4	11.6
15-19 years	5	3.9	3.1
More than 20 years	7	5.4	2.5
Employment status	<i>n</i>	%	(% of Total T1 Sample)
Full-time	62	48.1	40.2
Part-time	34	26.4	23.4
Casual	33	25.6	36.4
Management responsibility	<i>n</i>	%	(% of Total T1 Sample)
Yes	42	32.6	27.3
No	87	67.4	72.7

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Table 2

Sample breakdown by work group

Work group (site)	1	2	3	4	5	6	7	8	9	10	11	12
T1 (<i>n</i>)	6	51	16	19	8	5	7	9	7	12	11	15
T2 (<i>n</i>)	14	68	36	24	15	11	9	5	5	10	13	7
T3 (<i>n</i>)	10	66	31	15	8	10	9	10	4	12	8	11
Matched (nested) participants T1→T3	3	22	4	10	7	3	4	5	3	5	5	3
Work group (site)	13	14	15	16	17	18	19	20	21	22	23	24
T1 (<i>n</i>)	6	8	7	4	7	14	17	18	6	7	7	38
T2 (<i>n</i>)	6	9	7	5	7	8	10	10	22	5	7	37
T3 (<i>n</i>)	9	7	7	4	10	8	9	10	7	7	8	37
Matched (nested) participants T1→T3	3	2	4	3	4	3	3	4	3	3	4	19
Work group (site)	Not specified			New work sites				Total sample				
T1 (<i>n</i>)	13			N/A				318				
T2 (<i>n</i>)	11			15				376				
T3 (<i>n</i>)	27			8				352				

Note: Final sample of matched participants nested within work groups with valid, matched responses T1→T3: *N*=129

Participants were matched year-on-year so that only participants with complete responses across all the three years were included in the final sample. This saw the sample size drop from the initial 318 at T1, to 129 at T3, indicating an attrition rate of 59.4% from the T1 sample. Employees that moved between primary work sites during the data capture period were excluded, as they could not be included into a nested group. Employees that

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completed the surveys without identifying their work location were also excluded, for the same reason.

Although the overall response rate was high, attrition due to suitability for panel modelling was substantial (refer to Table 2). Attrition analysis revealed no differences of note in the demographics of the original sample and the matched participants at T1 (refer to Table 1). Mean levels of JS and OC of the total T1 sample ($N=318$) were compared with those of participants that were able to be nested in a work group and matched across T1-T3 ($N=129$). No significant differences were found at T1 for JS or OC (refer to Table 3), suggesting that panel attrition was not selective.

Table 3

Attrition analysis: mean JS and OC at T1 of matched participants and the total T1 sample

Variable	Matched participants	<i>SD</i>	Total T1 sample	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>
JS	3.73	0.75	3.70	0.81	-0.362	445	.717
OC	3.92	0.77	3.93	0.79	0.122	445	.903

Measures

Demographic variables

Variables captured include age, gender, length of tenure, work area, work location, and management responsibility. Demographic variables for participants were captured in the T1 survey. It is important to note that some of these demographic variables may have changed throughout the period of the data capture. Employees that extended their tenures, moved into another age bracket, or changed their employment type (for example, from casual to permanent), are only represented by their T1 response. No demographic variables were used in the final analyses.

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Job satisfaction

JS was measured using 11 items. The JS survey was adapted from the Job Descriptive Index (JDI) (Gregson, 1990; Roznowski, 1989; Smith, 1969). Items captured perceptions regarding pay, conditions, management, opportunities, colleagues, training and work content. Items such as “Taking everything into consideration, to what extent are you satisfied with your job?” and “Taking everything into consideration, to what extent are you satisfied with your opportunities for promotion?”, were scored on a 5-point Likert scale, ranging from “not at all” (1) to “to a large extent” (5). A combined “Total Satisfaction” score was calculated by combining scores from each item and calculating the mean rating out of five. Cronbach’s alpha was calculated to assess the reliability of the JS scale with α ranging from .92 to .93 (refer to Table 4), suggesting high reliability of the scale at each time point.

Organisational commitment

OC was captured using five items adapted from the OC Questionnaire (OCQ; Mowday et al., 1979) and subsequent variants including that of Cook and Wall (1980) and Allen and Meyer (1990). The first four items were scored on a 5-point Likert scale, ranging from “not at all” (1) to “to a large extent” (5). These questions capture perceptions of a felt sense of belonging, role clarity, sense of contribution to the overall direction of the organisation, and likelihood of recommending the organisation as a place of work. Questions included “To what extent do you understand how your role contributes to the overall direction of the organisation?” and “To what extent do you feel a sense of belonging?”. The four items were combined to form a “Total Commitment” score, by combining the scores from the four items and calculating the mean rating out of five. The fifth question was a multiple-choice question capturing employees’ future intentions. This question was not included in the “Total Commitment” score due to the differing format. Cronbach’s alpha was calculated to assess

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the reliability of the OC scale, with α ranging from .80 to .82 (refer to Table 4), suggesting acceptable reliability of the scale at each time point.

Procedure

Ethics approval was confirmed by the University of Adelaide School of Psychology Research Ethics Committee on 24/3/2023.

Data capture

In June of each year, survey links were sent via email to all staff employed within the organisation, including full-time, part-time and casual staff. The survey was conducted on Checkbox (an online survey platform) by an external organisational psychology business, contracted to conduct the staff surveys as an independent third party. All participants provided informed consent before commencing the survey. Data was exported in CSV files and was provided for this study for a three-year period (2019-2021). The organisation and individuals were de-identified.

Study plan & design

Descriptive statistics, assumptions testing, checks for normality and correlations were completed for the study variables using SPSS v28. Sufficient organisational groups were identified (refer to Table 2), and multilevel modelling Mplus Version 8.5 (Muthén & Muthén, 2017) software was used to conduct multilevel cross-lagged panel modelling (with employees nested within work units). Level 1 represents individual data and Level 2 represents data aggregated to the level of the work unit. Prior to aggregating Level 2 data, Intraclass Correlation Coefficients (ICC) were calculated to ensure sufficient group variance (Bliese, 2000; James et al., 1984; Mathieu & Taylor, 2007).

The data were analysed using a cross-lagged panel model (Finkel, 1995). Due to the complexity of the three-wave data structure, according to recommendations (e.g. Meier & Spector, 2013; Zablah et al., 2016), the individual-level analysis was conducted in multiple

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stages. First, individual-level structural equation models that specified the cross-lagged paths between JS and OC were examined. Second, individual-level time invariance was tested to understand if the relationships between the cross-lagged paths change over time or remain stable. Third, a multilevel cross-lagged path analysis was conducted to identify the nested structure of the data to differentiate between individual-level and organisation-level effects.

Data screening and assumption testing

Descriptive statistics were analysed, and assumption testing and checks for normality suggested the data were within acceptable ranges to be treated as normally distributed (refer to Table 4). Values for asymmetry and kurtosis between -2 and +2 are considered acceptable to assume normal univariate distribution (George & Mallery, 2010). Analyses of Variance (ANOVA) were run on the final sample at Level 1 (the individual level), revealing no significant differences across demographic variables in perceptions of JS or OC at all time points, except for JS between employees with different employment status, at T3 only. Permanent part-time employees ($M = 3.40$, $SD = 0.95$) recorded lower JS at T3 compared to casual staff ($M = 3.87$, $SD = 0.61$): $F(2, 124) = 3.27$, $p = .041$. Bonferroni post-hoc analysis confirmed the significant difference (Mean difference = 0.48, $SD = 0.19$, $p = .037$).

Table 4

Means and tests for normality of the final sample at Level 1, and scale reliability

Variable	Mean	SD	Skewness	SE	Kurtosis	SE	Cronbach's α
T1 OC	3.92	0.77	-0.96	0.22	1.47	0.43	.80
T1 JS	3.73	0.75	-0.64	0.22	0.39	0.43	.93
T2 OC	4.05	0.73	-0.67	0.22	-0.11	0.43	.82
T2 JS	3.76	0.73	-0.34	0.22	-0.36	0.43	.92
T3 OC	3.91	0.75	-0.90	0.22	1.21	0.43	.80
T3 JS	3.65	0.77	-0.44	0.22	0.10	0.43	.93

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Pearson's r correlations were calculated with almost all variables significantly positively correlated. The strongest correlations appeared between JS and OC at the same time point (refer to Table 5).

Table 5

Correlations (Pearson's r) at Level 1 (individual) and Level 2 (nested work group) and intraclass correlations coefficients (ICC) of variables at Level 2

Variable	T1 OC	T1 JS	T2 OC	T2 JS	T3 OC	T3 JS
T1 OC	-	.740**	.707**	.734**	.771**	.609*
T1 JS	.790**	-	.558	.752**	.681**	.645**
T2 OC	.659**	.606**	-	.845**	.780**	.800**
T2 JS	.578**	.690**	.803**	-	.767**	.814**
T3 OC	.681**	.544**	.695**	.633**	-	.909**
T3 JS	.591**	.651**	.696**	.769**	.824**	-
ICC	.02	.03	.06	.05	.05	.11

Note: Correlations above the diagonal are at the nested work-group level (Level 2; $n = 24$); those below the diagonal are at the individual level (Level 1; $N = 129$).

* Correlation is significant at the $p < .05$ level (two-tailed).

** Correlation is significant at the $p < .01$ level (two-tailed).

Given the strong correlations observed, confirmatory factor analysis was used to determine that JS and OC at T1 were separate constructs. Model fit was assessed using: the chi-square/ df ratio (χ^2/df), the Tucker-Lewis Index (TLI) and the Comparative Fit Index (CFI) (Bentler, 1990), the Incremental Fit Index (IFI) and the Root Mean Square Error of Approximation (RMSEA) (Browne & Cudek, 1992). The two-factor model provided a suitable fit, with a χ^2/df ratio of less than 3:1 indicating a good model fit (Kline, 1998). Additional fit indices were also considered – TLI, CFI and IFI values of greater than .90, and RMSEA values of less than .08 are considered to represent appropriate fit (Byrne, 2016). The

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two-factor solution was a marginally more suitable fit than the single-factor solution (refer to Table 6).

Table 6

Results of confirmatory factor analyses

Model	χ^2	<i>df</i>	<i>p</i>	CFI	TLI	IFI	RMSEA
One-factor	266.87	90	<.001	.859	.835	.861	.124
Two-factor	244.70	89	<.001	.876	.853	.877	.117

Note: Both models used a maximum likelihood estimation

To justify the treatment of JS and OC as multilevel constructs, ICC were examined to determine group variance and the viability of aggregating scores to the work-group level of analysis ('Level 2'; clusters: $n=24$; mean cluster size, $n=5.38$). The items exhibited low-to-moderate ICC (refer to Table 5). ICC of greater than .40 are considered moderate (Cicchetti, 1994), although objective thresholds or cutoffs may not apply to all samples and in all contexts, and a case-by-case approach is recommended, especially in the social sciences (Lai & Kwok, 2015). ICC as small as .02 to .05 have been used with multilevel models where even small variances warrant investigation (Burns & Machin, 2013; Cook et al., 1997). The ICC were sufficient at T2 and T3, however, the ICC at T1 for both JS (.03) and OC (.02) were low. However, the increasing ICC at T2 and T3 suggested that JS and OC evolved within the nested work groups independently to individual experiences. Thus, progressing to multilevel analysis was justified.

Cross-lagged panel modelling

Cross-lagged models attempt to disentangle reciprocal relationships and test causal influence over time (Lang et al., 2011; Ployhart & Vandenberg, 2010). CLPM can reveal how factors influence each other over time, to identify both predictors of future outcomes and potential targets for intervention. CLPM can assist in illustrating potential cascading effects

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between variables over time (Baribeau et al., 2022). CLPM can be particularly useful where randomised control trials are both impractical and unethical, such as those in many fields of social and health science. Despite the numerous limitations of CLPM – most prominently that they fail to account for individual-level associations, which can bias estimates of causation (Lucas, 2023) – they are fundamental to non-experimental and epidemiological research in social sciences and mental health (Baribeau et al., 2022).

The efficacy of CLPM in depicting causal associations has been challenged (Hamaker et al., 2015). Contemporary studies have softened interpretations of findings away from causality, considering the growing recognition of the limitations and sensitivities of structural equation models: recent terminology has shifted towards ‘reciprocal effects,’ ‘directional effects,’ ‘cross-domain effects,’ and ‘influence’ (Baribeau et al., 2022). When inspecting cross-lagged models, readers can form impressions about the chosen variables and their reciprocal influence over time, and the strength and direction of the associations. Cross-lagged paths are adjusted for path stability and within-time associations. Accordingly, absolute values that are smaller than traditional cut-offs or thresholds (e.g. conventional thresholds of *Cohen’s d*) can still be meaningful (Adachi et al., 2015). Effect sizes of cross-lagged paths should be interpreted in relation to the magnitude of the bivariate within-time correlations and stability paths (Baribeau et al., 2022).

CLPM was used to assess the cross-lagged reciprocal effects of JS and OC. A standard (time-lagged) and a time-invariant model were assessed. A third model, analysing the multilevel effects, was also analysed. Chi-square goodness-of-fit tests were conducted to assess the adequacy of the models. The chi-square results were insufficient as standalone indices of suitability due to the sensitivity of the result to sample size (Byrne & Van der Vijver, 2010). Additional fit measures were considered, including CFI and TLI; RMSEA; and standardised root mean square residual (SRMR) (Barrett, 2007). RMSEA of less than .8;

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SRMR of less than .08; and both the CFI and TLI of greater than .90, are considered ideal markers of model fit (Hu & Bentler, 1999). Fit indices should be treated as guidelines and are not definitive (Marsh et al., 2004).

A comment on sample size

Including a nested-group structure is integral to attempt to account for the various shared (and unique) values within and between groups in a hierarchical or multilevel organisation (Raudenbush & Bryk, 2002). Preparing the data for analyses including nested groups resulted in a substantially decreased sample size: matching participants across years led to a high drop-out rate. Only participants that had used the same email address to register for the survey each year were able to be matched between years, and included in the final sample.

A general rule of $N=200$ has sometimes been proposed for CLPMs with multiple waves: however, when the measures are reliable and valid, supported by strong underlying cross-lagged associations, and the models are not complex, smaller sample sizes may be sufficient (Iacobucci, 2010). Cut-offs are not intended to be absolutes: interpreting model fit is subjective, and depends partly on the research question, context, implications and setting for results (Hooper et al., 2008). When the attrition rate of a sample is greater than 50 percent, the results of panel models may not be generalised beyond those respondents retained in final analyses (Menard, 2002). Since the attrition rate in the present dataset exceeds that standard, the data may not be generalised beyond the panel to the original sample. As such, broader generalisations to Australian working populations are also not possible.

Results

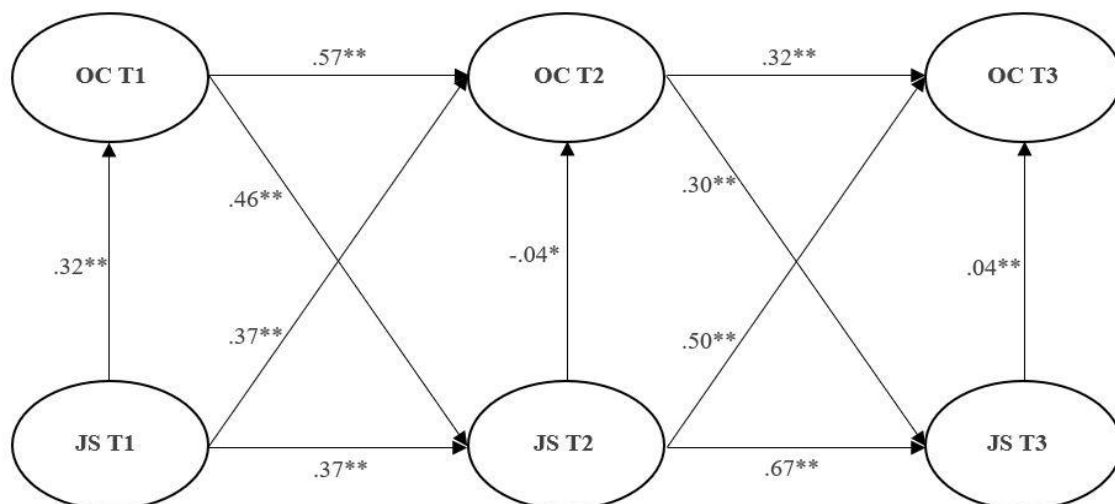
CLPM – standard model

The standard CLPM confirmed positive, cross-lagged effects of both JS on OC, and OC on JS. The standard CLPM fit is adequate (see Table 7) and a more suitable fit than the time-invariant model, supporting the existence of time-lagged effects. The effects differed across time; the relationship of the lagged effects changed from T1→T2 to T2→T3 – the lagged effect of OC on JS was stronger than JS on OC from T1→T2, while the inverse was observed at T2→T3, where there was a stronger cross-lagged effect of JS on OC than OC on JS (Figure 1 and Table 8).

The lagged effects within constructs displayed a similar pattern, with OC at T1 having a stronger lagged effect on OC at T2, than JS at T1 had on JS at T2. The inverse was then found between T2 and T3, with JS displaying a stronger lagged effect than OC. The relationship between JS and OC at T1 differed to the relationship at the subsequent time points. It is important to note the differences in the sample characteristics at T1 (i.e. the possible inclusion of new starters, which was not possible at T2 or T3).

Figure 1

Standard cross-lagged panel model



* Significant at the $p < .05$ level (two-tailed); ** Significant at the $p < .01$ level (two-tailed).

Table 7

Model fit test results

Measurement invariance analyses	χ^2 (Robust)	χ^2 (scaling correction factor)	df	p	CFI	TLI	SRMR	RMSEA
Standard model	87.15	1.19	4	<.001	.845	.458	.062	.401
Time invariance model	104.18	1.17	8	<.001	.821	.686	.067	.305
Multilevel model	93.59	*	8	<.001	.902	.632	.067 [#] .075 [^]	.288

**scaling correction factor undefined for MLR*

within groups ^ between groups

CLPM – time invariance

A time invariance model was run to assess the impact of time on the relationships between JS and OC. The model was a less suitable fit than the standard (time-lagged) model ($\Delta \chi^2 = 17.03$, $\Delta df = 4$, $p < .01$) (refer to Table 7), supporting the suitability of the standard model, which confirmed the effect of time on the relationship between JS and OC.

CLPM – multilevel

A multilevel CLPM was run to assess within- and between-group effects. The overall model fit was suitable (Table 7), suggesting that there were multilevel impacts on individual experiences over time (although the model was not a more suitable fit than the standard (time-lagged) model: $\Delta \chi^2 = 6.44$, $\Delta df = 4$, $p < .90$). The model showed unique reciprocal group-level effects at T3 (refer to Table 8).

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Table 8

Standardised Estimates for the cross-lagged panel models

Effect	Estimate (cross-lagged effects)		SE	
<i>Standard Model</i>				
OC → JS				
T2	.46**		.09	
T3	.30**		.07	
JS → OC				
T2	.37**		.06	
T3	.50**		.06	
<i>Time invariance model</i>				
OC → JS				
T2	.38**		.06	
T3	.38**		.06	
JS → OC				
T2	.40**		.03	
T3	.40**		.03	
<i>Multilevel model</i>				
	Estimate		SE	
	Within	Between	Within	Between
OC → JS				
T2	.46**	.59	.06	.57
T3	.27**	1.07*	.08	.35
JS → OC				
T2	.37**	.99	.06	.78
T3	.46**	1.62**	.09	.45
* $p < .01$, ** $p < .001$				

Hypothesis 3

Minor fluctuations were observed in JS and OC across T1 → T3 (refer to Table 9).

Differences were compared at both Level 1 and Level 2. There were no significant differences in either JS or OC between any time points, at Level 1 or Level 2. Matched

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participants were then compared to the total sample, with no significant differences observed.

The pattern of (statistically insignificant) fluctuations was largely consistent in all samples.

Table 9

Mean OC and JS, T1-T3, of matched participants at Level 1 and Level 2, and the total sample

Sample	T1 OC	T1 JS	T2 OC	T2 JS	T3 OC	T3 JS
Matched participants (Level 1)	3.92	3.73	4.05	3.76	3.91	3.65
Level 2 (aggregated) data	3.92	3.78	4.10	3.76	3.87	3.64
Total sample	3.93	3.70	4.02	3.81	3.97	3.71

Discussion

This study assessed the reciprocal, time-lagged relationship between JS and OC using cross-lagged panel modelling with an Australian sample. The model confirmed the positive effects of time lags on the relationship between JS and OC, supporting existing evidence that the reciprocal relationship evolves and changes over time. The individual lagged effect of OC on JS was stronger initially (T1-T2) while later the inverse was observed where there was a stronger cross-lagged effect of JS on OC (T2-T3). Multilevel cross-lagged panel modelling confirmed unique reciprocal group-level effects at T3. The initial model suggests that an individual's JS and OC is influenced by membership of a work group over time – the underlying JS and OC of the individual will promote the development of emergent group perceptions of JS and OC, with reciprocal impacts. These preliminary findings suggest that group members are likely to adjust their perceptions of JS and OC towards the group perception over time: whether entering a work group with high or low JS and OC, the individual's perceptions of JS and OC are likely to habituate and conform towards the group levels of JS and OC over time with resultant reciprocal impacts. Further analysis assessed

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changes in JS and OC as impacted by the societal and economic instability experienced during the Covid-19 pandemic – no significant changes were found, representing a stable, steady perception of JS and OC across this sample in the pre-, early- and mid-pandemic period.

The standard CLPM confirmed a positive, cross-lagged effect of both JS on OC, and OC on JS, supporting the findings of Xu et al. (2023). The relationship between JS and OC strengthened linearly from T1 to T3, at both the individual and group level, in line with the extant literature (Chen, 2007; Colakoglu et al., 2010; Čulibrk et al., 2018; Currivan, 1999; Meyer et al., 2002). The nature of these relationships was further supported by the time-invariance CLPM, which provided a less suitable model fit than the standard model, suggesting that the reciprocal relationship between JS and OC changes over time (as identified in the standard model). This finding underlines the importance of robust multi-wave, multilevel longitudinal analysis to capture the nuances of the JS-OC relationship over time at the nested-group level. The multilevel CLPM produced some significant results, suggesting that group-level factors influence JS, OC, and the interplay of both, in unique ways within work groups over time: distinct experiences unfold within nested work groups that directly influence employees' perceptions of JS and OC. This preliminary finding warrants further investigation with robust and diverse samples.

Hypothesis 3 – that there would be increases in JS and OC at T2 and T3 due to societal and economic instability – was not supported, with no significant changes observed in any of the samples from T1→T2, T2→T3, or T1→T3, in either JS or OC. While there were small fluctuations in overall levels of JS and OC, none of the changes were statistically significant. The findings represent a consistent perception of JS and OC among those staff that remained employed throughout the three-year period, and were able to be matched T1→T3. JS and OC of the matched participants were closely aligned to the overall organisational levels at T1, T2

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and T3. The small and statistically insignificant pattern of fluctuations of JS and OC was mirrored across both samples. The same comparisons using the aggregated (Level 2) data also failed to produce any significant differences. While the attrition rate of the final sample excludes generalisation to the whole organisation, using the total samples it became apparent that the perceptions of JS and OC were consistent across all levels within the organisation.

Multilevel impacts

The results suggest that membership of a work group directly influences an individual's JS and OC. The standard CLPM suggests that regardless of an individual's level of JS at T1, the level of JS within the group at T1 will have a direct impact on that individual's OC at T2. For example, an employee may have low JS, but if their work group has high JS, that individual is likely to experience higher levels of OC at T2, than they would have if they were in a work group with lower JS at T1. The same lagged effect of group membership of OC at T1 on an individual's experience of JS at T2 was also observed. Similar effects of both JS and OC were also observed from T2 to T3. The results suggest that the collective JS and OC within a nested work group will directly influence the JS and OC of the group members, and these effects increase over time as individuals remain within the nested work group. These findings underscore the significance of considering multilevel impacts of work-group membership, an area that has gained increasing attention in recent years (Chai et al., 2020; Lee & Jamil, 2016; Liu & Werblow, 2019).

The findings illuminate the intricate dynamics that shape JS and OC within organisations. Work groups and hierarchical work units exert direct influence over employee attitudes, alongside the broader organisational context – and this influence changes over time. This aligns with previous research highlighting the importance of group dynamics in shaping individual perceptions of JS and OC (Ilies et al., 2007). Employees within work groups experience unique contextual factors that can either enhance or diminish their JS. For

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example, cohesive and supportive work groups can contribute positively to JS, fostering a sense of belonging and camaraderie among employees, and therefore leading to increased OC (Mowday et al., 1979). The JS and OC within a nested work group is shaped by interactions between employees, the management and leadership they receive, and group members' perception of the broader organisational climate (Vandenberghe et al., 2004). Work groups that empower individuals and provide open, communicative leadership are more likely to exhibit higher OC (Laschinger et al., 2009). In this regard, the role of management and leadership in shaping the JS and OC of the nested work group is of primary significance. Leader-member exchange (LMX) (Liden et al., 1997; Sparrowe & Liden, 1997) has been shown to directly influence both JS and OC (Gerstner & Day, 1997). Managers that use a relationship-based approach to leadership and communicate openly and frequently with their subordinates (i.e. high LMX) are more likely to see positive organisational outcomes including increases in JS, OC and employee empowerment (Harris et al., 2009; Laschinger et al., 2009).

The reciprocal relationship

The results of this study provide support for the reciprocal relationship between JS and OC, in line with previous research (Angle & Perry, 1983; Stevens et al., 1978; Tsai & Huang, 2008; Valaei & Rezaei, 2016; Williams & Haser, 1986). The findings suggest that employees who are more satisfied with their jobs tend to exhibit higher levels of commitment to their organisations, and vice versa. The positive time-lagged effects of both JS on OC and OC on JS suggests that the constructs influence each other over time, and that the nature of the relationship is consistent at both the level of the individual and within nested work groups.

At the macro level, this finding can inform organisational operations. Organisations will benefit from recognising that enhancing JS within work groups will lead to increased OC. Management and leadership training and strategies that focus on JS and OC may benefit

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organisational operations and outcomes, including increased performance and staff retention (Christian et al., 2011). Conversely, a lack of JS can lead to lower OC; both JS and OC are precursors to decreased employee engagement and retention (Giesler et al., 2019).

The impact of societal and economic instability

This study attempted to understand influences on JS and OC beyond the confines of the organisational structure, to explore the role of societal and economic instability on employee attitudes. Hypothesis 3, proposing that societal and economic instability leads to increased JS and OC, was not supported by our findings. This result does not necessarily align with the literature highlighting that during times of uncertainty, employees who retain their jobs often exhibit increased JS and OC, possibly due to perceived job security (Greenhalgh & Rosenblatt, 1984; Lu et al., 2019). It is important to consider that the societal and economic conditions during the height of the Covid-19 pandemic (T2 and T3 in this study) may not have been comparable to previously assessed periods of uncertainty and instability, given the unprecedented levels of social and economic disruption compared with previous periods of instability widely analysed in the extant literature.

The anticipated changes in JS and OC at T2 and T3 (overall increases) may have also been moderated by perceptions of job insecurity during the same period, which can lead to decreased job engagement, contributing to lower JS and OC. Although the staff used for the final analyses kept their jobs for the duration for the duration of the study, perceptions of job insecurity were widely held during the Covid-19 pandemic (Jung et al., 2021).

Future directions

Multi-dimensional nature of OC and JS

The practical demands of this study saw OC considered as a single construct. OC encompasses affective, normative, and continuance commitment, each with unique determinants and consequences (Meyer et al., 2002). Without considering these distinct

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dimensions of OC, interpretations of the time-lagged effects and relationships between JS and OC are confined to the macro-level. Nuanced and comprehensive interpretations of the findings at the dimension-level of OC are therefore not possible. Future studies will benefit from incorporating the various dimensions of OC to understand how and when OC develops and is influenced by JS over time.

Similarly, JS was considered in this study as a singular construct. The individual items used to capture JS can provide meaningful information that organisations may use to directly influence the employee experience. For example, Item 3, capturing the respondent's satisfaction with their current pay, provides information in an area that most organisations will have direct or indirect (and immediate) control over – remuneration, and/or the employee value proposition (Goswami, 2015). Likewise, Item 5, capturing the respondent's satisfaction with their opportunities for promotion, can be acted upon and influenced by direct intervention. Utilising the granular information within measures of OC and JS can provide specific impetus for action or intervention for organisations. Future studies may analyse the effectiveness of organisational interventions, strategies or programs targeted at one or more of the specific items within the JS scale to measure changes in perceptions over time. Such studies may facilitate an understanding the most impactful ways to influence JS within work groups over different time frames and with different levels of resourcing, with a view to informing organisational practice.

Objective measures of organisational success

Two factors that can provide greater context and generalisability to such findings are organisational financial performance, and employee retention/staff turnover data. Future studies may seek to obtain objective measures against which JS and OC can be linked. This would provide greater context to a broader audience, and offer tangible support for organisations to focus on improving JS and increasing the OC of their employees. Retaining

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employees is a cost-saving and revenue increasing measure. Future studies should aim to show how ensuring employees are satisfied and committed within their work groups leads to beneficial outcomes for both the employees and the organisation. Establishing the link to performance and financial outcomes may be most impactful in this regard.

Limitations

Limitations with the sample

The sample provided a marginal fit for multilevel modeling using nested groups – traditional or summary statistics may also have been appropriate and warranted with this sample (McNabb & Murayama, 2021). While cut-offs of cluster sizes of five or more are recommended (Maas & Hox, 2004), groups as small as three have been shown to be suitable in some contexts (Bell et al., 2010; Clarke & Wheaton, 2007). Only eight of the work groups had five or more matched participants. However, although the cluster-to-sample ratio increased the potential error rate (Carle, 2009; Lai & Kwok, 2015; Sanders, 2011), the uneven distribution of cluster sizes justified the use of multilevel modelling (McNabb & Murayama, 2021). The number of nested groups ($n=24$) was acceptable according to suggested minimums (Schunck, 2016), although future studies may benefit from larger samples with more Level 1 participants nested within work groups, to increase the mean cluster size (Maas & Hox, 2004). Limitations and challenges also arose with the small intraclass correlation coefficients (ICC). Using larger samples in future studies may see greater variance in ICC, providing stronger bases for future multilevel models.

Investigation timing and time-lags

The period in which the survey was conducted spanned three years in which the societal impacts of the Covid-19 pandemic were profound. The rapidly changing personal, interpersonal and societal changes brought on by the pandemic mean that capturing perceptions of constructs such as JS and OC at a single timepoint may not have provided a

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comprehensive assessment or reflection of the preceding year. Conversely, the social volatility of the period of data capture may have exposed the survey to unexpected and unpredictable factors not equally represented in preceding or subsequent years. These challenges are inherent in annual surveys, even outside of periods of global pandemics. Future staff surveys may look to stagger the deployment across a workforce such that a portion of staff undertake the survey in one quarter, another portion in the next quarter, and so on. The “rolling” nature of the data capture may provide a more accurate reflection of the ebbs and flows of constructs such as JS and OC during and across years.

Long time-lags may only yield significant cross-lagged effects by chance or due to omitted third variables: extended time lags between data collection points can diminish the strength of causal effects (Dormann & Griffin, 2015). When data is captured annually (i.e. a long time-lag between data points), cause may become effect over time (Taris & Kompier, 2014). To obtain more accurate stability estimates, more complex models are recommended, especially when dealing with multi-wave data (Dormann & Griffin, 2015).

Turnover intention

The nature of this study precluded responses from employees that left the organisation in between surveys. By including only employees that remained within their work group for at least the 25-month period of the data capture (i.e. T1 to T3), the ability to compare the intention to leave with actual attrition and turnover rate is lost. Staff with short-term tenures were also excluded, and no new staff were included after T1. Thus, analysis of ‘newcomer status’ was not possible. Turnover intention was also not included in the overall scores for OC, due to the differing question format (see Appendix C). Turnover intention could be recoded in future surveys to enable a comparable format (i.e. a 5-point Likert scale). Including turnover intention into a scale of OC also has retrospective value; turnover

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intention has been widely used as a reference point for OC, providing a tangible measure which can be objectively compared against actual turnover data from organisations.

Conclusion

This study provides a preliminary assessment of the multilevel impacts on the JS-OC relationship over time. The reciprocal, time-lagged relationship between JS and OC within nested work groups was confirmed by CLPM. Societal and economic disruption in the form of the Covid-19 pandemic did not impact individual JS and OC in the manner suggested in the extant literature – JS and OC remained steady at T1→T3. While limitations were present in the sample and study design, significant findings of changes in the JS-OC relationship unique to nested work groups provides an extension of current literature.

The findings present opportunities and impetus for organisations and managers. Recognising the multilevel impacts on JS and OC emphasises the importance of fostering positive group dynamics and creating a supportive organisational climate. Significantly, the results highlight the influence that group perceptions of constructs such as JS and OC exert on individual experiences over time. Regardless of an individual's initial JS and OC, membership within a nested work group will directly influence the individual's JS and OC over time. Increasing this understanding can inform organisational development, leadership and management approaches to optimise JS and OC within nested work groups and across organisations more broadly.

References

- Adachi, P. & Willoughby, T. (2015). Interpreting effect sizes when controlling for stability effects in longitudinal autoregressive models: Implications for psychological science. *European Journal of Developmental Psychology, 12*(1), 116–128.
<https://doi.org/10.1080/17405629.2014.963549>
- Aguinis, H., Gottfredson, R. K., & Culpepper, S. A. (2013). Best-practice recommendations for estimating cross-level interaction effects using multilevel modeling. *Journal of Management, 39*(6), 1490-1528. <https://doi.org/10.1177/0149206313478188>
- Allen, D. G., Bryant, P. C., & Vardaman, J. M. (2010). Retaining talent: Replacing misconceptions with evidence-based strategies. *The Academy of Management Perspectives, 24*(2), 48–64. <https://doi.org/10.5465/AMP.2010.51827775>
- Allen, N. J. & Meyer, J. P. (1990). The measurement and antecedents of affective, continuance and normative commitment to the organization. *Journal of Occupational Psychology, 63*(1), 1–18. <https://doi.org/10.1111/j.2044-8325.1990.tb00506.x>
- Anderson, T. N., & Kida, T. E. (1982). The cross-lagged research approach: description and illustration. *Journal of Accounting Research, 20*(2), 403-414.
<https://doi.org/10.2307/2490748>
- Angle, H. L., & Perry, J. L. (1983). Organizational commitment: Individual and organizational influences. *Work and occupations, 10*(2), 123-146.
<https://doi.org/10.1177/0730888483010002001>
- Arnold, H. J., & Feldman, D. C. (1982). A multivariate analysis of the determinants of job turnover. *Journal of Applied Psychology, 67*(3), 350-360. <https://doi.org/10.1037/0021-9010.67.3.350>
- Baribeau, D. A., Vigod, S., Brittain, H., Vaillancourt, T., Szatmari, P. & Pullenayegum, E. (2022). Application of Transactional (Cross-lagged panel) Models in Mental Health

JOB SATISFACTION AND ORGANISATIONAL COMMITMENT: A MULTILEVEL ANALYSIS

- Research: An Introduction and Review of Methodological Considerations. *Journal of Canadian Academy of Child Adolescent Psychiatry*. 31(3), 124-134. PMID: PMC9275371
- Barrett, P. (2007). Structural equation modelling: Adjudging model fit. *Personality and Individual Differences*, 42(5), 815-824. <https://doi.org/10.1016/j.paid.2006.09.018>
- Bateman, T. S., & Strasser, S. (1984). A longitudinal analysis of the antecedents of organizational commitment. *Academy of Management Journal*, 27(1), 95-112. <https://doi.org/10.2307/255959>
- Bell, B. A., Morgan, G. B., Kromrey, J. D., & Ferron, J. M. (2010). The impact of small cluster size on multilevel models: A Monte Carlo examination of two-level models with binary and continuous predictors. *JSM Proceedings, Survey Research Methods Section*, 1(1), 4057-4067.
- Berson, Y. & Linton, J. D. (2005). An examination of the relationships between leadership style, quality, and employee satisfaction in R&D versus administrative environments. *R&D Management*, 35(1), 51-60. DOI:10.1111/j.1467-9310.2005.00371.x
- Bianchi, E. C., Martin, C. C. & Li, R. (2023). Does Job Satisfaction Rise and Fall with the Economy? Cross-Sectional, Longitudinal, and Experimental Evidence That Job Satisfaction Increases during Recessions. *Academy of Management Journal*, 66(2). <https://doi.org/10.5465/amj.2019.0405>
- Blau, P. M. (1960). A theory of social integration. *American journal of Sociology*, 65(6), 545-556.
- Bliese, P. D. (2000). Within-group agreement, non-independence, and reliability: Implications for data aggregation and analysis. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions* (pp.349-381). Jossey-Bass.

JOB SATISFACTION AND ORGANISATIONAL COMMITMENT: A MULTILEVEL ANALYSIS

Bowling, N. A., Eschleman, K. J., & Wang, Q. (2010). A meta-analytic examination of the relationship between job satisfaction and subjective well-being. *Journal of Occupational and Organizational Psychology*, 83(4), 915-934.

<https://doi.org/10.1348/096317909X478557>

Breevaart, K., Bakker, A. B., Hetland, J. & Demetriou, E. (2014). Daily Transactional and Transformational Leadership and Daily Employee Engagement. *Journal of Occupational and Organizational Psychology*, 87(1), 138-157.

<https://doi.org/10.1111/joop.12041>

<https://doi.org/10.1111/joop.12041>

Burns, R. A., & Machin, M. A. (2013). Employee and workplace well-being: A multi-level analysis of teacher personality and organizational climate in Norwegian teachers from rural, urban and city schools. *Scandinavian Journal of Educational Research*, 57(3), 309-324. <https://doi.org/10.1080/00313831.2012.656281>

<https://doi.org/10.1080/00313831.2012.656281>

Byrne, B. M., & Van de Vijver, F. J. (2010). Testing for measurement and structural equivalence in large-scale cross-cultural studies: Addressing the issue of nonequivalence. *International Journal of Testing*, 10(2), 107-132.

International Journal of Testing, 10(2), 107-132.

DOI:10.1080/15305051003637306

Carle, A. C. (2009). Fitting multilevel models in complex survey data with design weights: Recommendations. *BMC Medical Research Methodology*, 9(49).

<https://doi.org/10.1186/1471-2288-9-49>

Chai, D. S., Jeong, S., & Joo, B. K. (2020). The multi-level effects of developmental opportunities, pay equity, and paternalistic leadership on organizational commitment.

European Journal of Training and Development, 44(4/5), 405-424. DOI:10.1108/EJTD-

09-2019-0163

JOB SATISFACTION AND ORGANISATIONAL COMMITMENT: A MULTILEVEL ANALYSIS

- Chan, D. (1998). Functional relations among constructs in the same content domain at different levels of analysis: A typology of composition models. *Journal of Applied Psychology, 83*(2), 234. DOI:10.1037/0021-9010.83.2.234
- Chen, Y. J. (2007). Relationships among service orientation, job satisfaction, and organizational commitment in the international tourist hotel industry. *Journal of American Academy of Business, 11*(2), 71–82.
- Cho, S., Johanson, M. M., & Guchait, P. (2009). Employees intent to leave: A comparison of determinants of intent to leave versus intent to stay. *International journal of hospitality management, 28*(3), 374-381. <https://doi.org/10.1016/j.ijhm.2008.10.007>
- Christian, M. S., Garza, A. S., & Slaughter, J. E. (2011). Work engagement: A quantitative review and test of its relations with task and contextual performance. *Personnel psychology, 64*(1), 89-136. <https://doi.org/10.1111/j.1744-6570.2010.01203.x>
- Chye Koh, H., & Boo, E. F. H. (2004). Organisational ethics and employee satisfaction and commitment. *Management Decision, 42*(5), 677-693.
<https://doi.org/10.1108/00251740410538514>
- Cicchetti, D. V. (1994). Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. *Psychological Assessment, 6*(4), 284–290. <https://doi.org/10.1037/1040-3590.6.4.284>
- Clarke, P., & Wheaton, B. (2007). Addressing data sparseness in contextual population research: Using cluster analysis to create synthetic neighborhoods. *Sociological methods & research, 35*(3), 311-351. <https://doi.org/10.1177/0049124106292362>
- Colakoglu, U., Culha, O., & Atay, H. (2010). The effects of perceived organisational support on employees' affective outcomes: Evidence from the hotel industry. *Tourism and Hospitality Management, 16*(2), 125-150. SSRN:
[https://ssrn.com/abstract=2063403UDC 640.4:658.3\]\(560](https://ssrn.com/abstract=2063403UDC 640.4:658.3](560)

JOB SATISFACTION AND ORGANISATIONAL COMMITMENT: A MULTILEVEL ANALYSIS

- Cook, T. D., Shagle, S. C., & Degirmencioglu, S. M. (1997). Capturing social process for testing mediational models of neighborhood effects. In *Neighborhood poverty: Context and consequences for children*. Russell Sage Foundation Press.
- Cook, J., & Wall, T. (1980). New work attitude measures of trust, organizational commitment and personal need non-fulfilment. *Journal of Occupational Psychology*, 53(1), 39–52. <https://doi.org/10.1111/j.2044-8325.1980.tb00005.x>
- Cooper-Hakim, A., & Viswesvaran, C. (2005). The construct of work commitment: Testing an integrative framework. *Psychological Bulletin*, 131(2), 241-259. <https://doi.org/10.1037/0033-2909.131.2.241>
- Cropanzano, R., & Mitchell, M. S. (2005). Social exchange theory: An interdisciplinary review. *Journal of Management*, 31(6), 874–900. <https://doi.org/10.1177/0149206305279602>
- Ćulibrk, J., Delić, M., Mitrović, S. & Ćulibrk, D. (2018). Job Satisfaction, Organizational Commitment and Job Involvement: The Mediating Role of Job Involvement. *Frontiers in Psychology*, 9. <https://doi.org/10.3389/fpsyg.2018.00132>
- Currivan, D. B. (1999). The causal order of job satisfaction and organizational commitment in models of employee turnover. *Human Resource Management Review*, 9(4), 495–524. DOI: 10.1016/S1053-4822(99)00031-5
- Curry, J. P., Wakefield, D. S., Price, J. L., & Mueller, C. W. (1986). On the causal ordering of job satisfaction and organizational commitment. *Academy of Management Journal*, 29(4), 847-858. <https://doi.org/10.2307/255951>
- DeJoy, D. M., Schaffer, B. S., Wilson, M. G., Vandenberg, R. J., & Butts, M. M. (2004). Creating safer workplaces: assessing the determinants and role of safety climate. *Journal of safety research*, 35(1), 81-90. <https://doi.org/10.1016/j.jsr.2003.09.018>

JOB SATISFACTION AND ORGANISATIONAL COMMITMENT: A MULTILEVEL ANALYSIS

Dormann, C. & Griffin, M. A. (2015). Optimal Time Lags in Panel Studies. *Psychological Methods*, 20(4), 489-505. <https://doi.org/10.1037/met0000041>

Eisenberger, R., Armeli, S., Rexwinkel, B., Lynch, P. D., & Rhoades, L. (2001). Reciprocation of perceived organizational support. *Journal of Applied Psychology*, 86(1), 42-51. <https://doi.org/10.1037/0021-9010.86.1.42>

Eleswed, M., & Mohammed, F. (2013). Job satisfaction and organizational commitment: A correlational study in Bahrain. *International Journal of Business, Humanities and Technology*, 3(5), 44-53.

Festinger, L. (1962). Cognitive dissonance. *Scientific American*, 207(4), 93-106.

Finkel, S. E. (1995). Causal analysis with panel data. Sage Publications, Inc.
<https://doi.org/10.4135/9781412983594>

Geisler, M., Berthelsen, H., & Muhonen, T. (2019). Retaining social workers: The role of quality of work and psychosocial safety climate for work engagement, job satisfaction, and organizational commitment. *Human Service Organizations: Management, Leadership & Governance*, 43(1), 1-15.
<https://doi.org/10.1080/23303131.2019.1569574>

George, D., & Mallery, M. (2010). SPSS for Windows Step by Step: A Simple Guide and Reference, 17.0 update (10th ed.) Boston: Pearson.

Gerstner, C. R., & Day, D. V. (1997). Meta-Analytic review of leader–member exchange theory: Correlates and construct issues. *Journal of Applied Psychology*, 82(6), 827-844.
<https://doi.org/10.1037/0021-9010.82.6.827>

Golden, T. D., Veiga, J. F., & Dino, R. N. (2008). The impact of professional isolation on teleworker job performance and turnover intentions: does time spent teleworking, interacting face-to-face, or having access to communication-enhancing technology

JOB SATISFACTION AND ORGANISATIONAL COMMITMENT: A MULTILEVEL ANALYSIS

matter?. *Journal of Applied Psychology*, 93(6), 1412-1421.

<https://doi.org/10.1037/a0012722>

Goswami, P. (2015). Employee value proposition: a tool for employment branding.

International Journal of Scientific and Research Publications, 5(12), 263-264.

Greenhalgh, L., & Rosenblatt, Z. (1984). Job insecurity: Toward conceptual clarity. *Academy of Management review*, 9(3), 438-448. <https://doi.org/10.2307/258284>

Gregson, T. (1990). Measuring job satisfaction with a multiple-choice format of the job descriptive index. *Psychological Reports*, 66(3), 787-793.

<https://doi.org/10.2466/pr0.1990.66.3.787>

Hamaker, E. L., Kuiper, R. M. & Grasman, R. P. (2015). A critique of the cross-lagged panel model. *Psychological Methods*, 20(1), 102–116. DOI: 10.1037/a0038889

Harris, K. J., Wheeler, A. R., & Kacmar, K. M. (2009). Leader–member exchange and empowerment: Direct and interactive effects on job satisfaction, turnover intentions, and performance. *The leadership quarterly*, 20(3), 371-382.

<https://doi.org/10.1016/j.leaqua.2009.03.006>

Harrison, D. A., Newman, D. A., & Roth, P. L. (2006). How important are job attitudes? Meta-analytic comparisons of integrative behavioral outcomes and time sequences. *Academy of Management Journal*, 49(2), 305-325.

<https://doi.org/10.5465/amj.2006.20786077>

Harter, J. K., Schmidt, F. L., & Hayes, T. L. (2002). Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: a meta-analysis.

Journal of Applied Psychology, 87(2), 268-279. <https://doi.org/10.1037/0021-9010.87.2.268>

Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress.

American Psychologist, 44(3), 513-524. <https://doi.org/10.1037/0003-066X.44.3.513>

JOB SATISFACTION AND ORGANISATIONAL COMMITMENT: A MULTILEVEL ANALYSIS

- Hooper, D., Coughlan, J. & Mullen, M.R. (2008). Structural equation modelling: Guidelines for determining model fit. *Electronic Journal of Business Research Methods*. 6(1), 53–60. DOI: 10.21427/D7CF7R
- Hsu, H. Y. (2009). *Organizational learning culture's influence on job satisfaction, organizational commitment, and turnover intention among R&D professionals in Taiwan during an economic downturn*. University of Minnesota.
- Hu, L. & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural equation modeling: a multidisciplinary journal*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Huang, T. C., & Hsiao, W. J. (2007). The causal relationship between job satisfaction and organizational commitment. *Social Behavior and Personality: An international journal*, 35(9), 1265–1276. DOI:10.2224/sbp.2007.35.9.1265
- Huang, Y. H., Lee, J., McFadden, A. C., Murphy, L. A., Robertson, M. M., Cheung, J. H., & Zohar, D. (2016). Beyond safety outcomes: An investigation of the impact of safety climate on job satisfaction, employee engagement and turnover using social exchange theory as the theoretical framework. *Applied ergonomics*, 55, 248-257. <https://doi.org/10.1016/j.apergo.2015.10.007>
- Humphrey, S. E., & LeBreton, J. M. (2019). *The handbook of multilevel theory, measurement, and analysis*. American Psychological Association.
- Iacobucci, D. (2010). Structural equations modeling: Fit indices, sample size, and advanced topics. *Journal of Consumer Psychology*. 20(1), 90–98. <https://doi.org/10.1016/j.jcps.2009.09.003>
- Ilies, R., Nahrgang, J. D., & Morgeson, F. P. (2007). Leader-member exchange and citizenship behaviors: a meta-analysis. *Journal of Applied Psychology*, 92(1), 269-277. <https://doi.org/10.1037/0021-9010.92.1.269>

JOB SATISFACTION AND ORGANISATIONAL COMMITMENT: A MULTILEVEL ANALYSIS

- James, D. L., Demaree, R. G., & Wolf, G. (1984). Estimating within-group interrater reliability with and without response bias. *Journal of Applied Psychology, 69*(1), 85–98. <https://doi.org/10.1037/0021-9010.69.1.85>
- Jung, H. S., Jung, Y. S., & Yoon, H. H. (2021). COVID-19: The effects of job insecurity on the job engagement and turnover intent of deluxe hotel employees and the moderating role of generational characteristics. *International Journal of Hospitality Management, 92*, 102703. DOI: 10.1016/j.ijhm.2020.102703
- Korek, S., Felfe, J., & Zaepfner-Rothe, U. (2010). Transformational leadership and commitment: A multilevel analysis of group-level influences and mediating processes. *European Journal of Work and Organizational Psychology, 19*(3), 364-387. <https://doi.org/10.1080/13594320902996336>
- Kozlowski, S. W. J., & Klein, K. J. (2000). A multilevel approach to theory and research in organization: Contextual, temporal, and emergent properties. In: K. J. Klein & S. W. J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations*, (pp. 3-90). San Francisco: Jossey-Bass
- Lai, M. H. C., & Kwok, O.-m. (2015). Examining the rule of thumb of not using multilevel modeling: The “design effect smaller than two” rule. *Journal of Experimental Education, 83*(3), 423–438. <https://doi.org/10.1080/00220973.2014.907229>
- Lance, C. E. (1991). Evaluation of a structural model relating job satisfaction, organizational commitment, and precursors to voluntary turnover. *Multivariate Behavioral Research, 26*, 137–162. https://doi.org/10.1207/s15327906mbr2601_7
- Lang, F. L., John, D., Lüdtke, O., Schupp, J. & Wagner, G. G. (2011). Short assessment of the Big Five: robust across survey methods except telephone interviewing. *Behavior Research Methods, 43*, 548-567. DOI: 10.3758/s13428-011-0066-z

JOB SATISFACTION AND ORGANISATIONAL COMMITMENT: A MULTILEVEL ANALYSIS

- Laschinger, H. K. S., Finegan, J., & Wilk, P. (2009). Context matters: The impact of unit leadership and empowerment on nurses' organizational commitment. *JONA: The Journal of Nursing Administration*, 39(5), 228-235. DOI: 10.1097/NNA.0b013e3181a23d2b
- Lawler, E. J. (1992). Affective attachments to nested groups: A choice-process theory. *American Sociological Review*, 57(3), 327-339. <https://doi.org/10.2307/2096239>
- Lawler III, E. E., & Suttle, J. L. (1973). Expectancy theory and job behavior. *Organizational behavior and human performance*, 9(3), 482-503. [https://doi.org/10.1016/0030-5073\(73\)90066-4](https://doi.org/10.1016/0030-5073(73)90066-4)
- Lee, B. H., & Jamil, M. (2016). An empirical study of organizational commitment: A multi-level approach. *Journal of Behavioral and Applied Management*, 4(3), 177-192. DOI: 10.12691/ajnr-7-5-7
- Lee, T. W., & Mitchell, T. R. (1994). An alternative approach: The unfolding model of voluntary employee turnover. *Academy of Management Review*, 19(1), 51-89. <https://doi.org/10.2307/258835>
- Lee-Kelley, L., Blackman, D. A., & Hurst, J. P. (2007). An exploration of the relationship between learning organisations and the retention of knowledge workers. *The learning organization*, 14(3), 204-221. DOI:10.1108/09696470710739390
- Liao, S-H., Hu, D-C. & Chung, H-Y. (2009). The relationship between leader-member relations, job satisfaction and organizational commitment in international tourist hotels in Taiwan. *The International Journal of Human Resource Management*, 20(8), 1810-1826. <https://doi.org/10.1080/09585190903087222>
- Liden, R. C., Sparrowe, R. T., & Wayne, S. J. (1997). Leader-member exchange theory: The past and potential for the future. In G. R. Ferris (Ed.), *Research in personnel and*

JOB SATISFACTION AND ORGANISATIONAL COMMITMENT: A MULTILEVEL ANALYSIS

human resources management, 15, 47-119. Elsevier Science/JAI Press. ISBN: 0-7623-0157-0

Liu, Y., & Werblow, J. (2019). The operation of distributed leadership and the relationship with organizational commitment and job satisfaction of principals and teachers: A multi-level model and meta-analysis using the 2013 TALIS data. *International Journal of Educational Research*, 96, 41-55. DOI:10.1016/j.ijer.2019.05.005

Lok, P., Westwood, R., & Crawford, J. (2005). Perceptions of organisational subculture and their significance for organisational commitment. *Applied Psychology*, 54(4), 490-514. DOI: 10.1111/j.1464-0597.2005.00222.x

Lu, H., Zhao, Y., & While, A. (2019). Job satisfaction among hospital nurses: A literature review. *International Journal of Nursing Studies*, 94, 21-31.
<https://doi.org/10.1016/j.ijnurstu.2019.01.011>

Lucas, R. E. (2023). Why the cross-lagged panel model is almost never the right choice. *Advances in Methods and Practices in Psychological Science*, 6(1), 1-22.
<https://doi.org/10.1177/25152459231158378>

Lumley, E. J., Coetzee, M., Tladinyane, R., & Ferreira, N. (2011). Exploring the job satisfaction and organisational commitment of employees in the information technology environment. *Southern African business review*, 15(1), 100-118.

Maas, C. J., & Hox, J. J. (2004). Robustness issues in multilevel regression analysis. *Statistica Neerlandica*, 58(2), 127-137. <https://doi.org/10.1046/j.0039-0402.2003.00252.x>

Marsh, H. W., Hau, K. T., & Wen, Z. (2004). In search of golden rules: Comment on hypothesis-testing approaches to setting cutoff values for fit indexes and dangers in overgeneralizing Hu and Bentler's (1999) findings. *Structural Equation Modeling*, 11(3), 320-341. https://doi.org/10.1207/s15328007sem1103_2

JOB SATISFACTION AND ORGANISATIONAL COMMITMENT: A MULTILEVEL ANALYSIS

- Martin, C. L., & Bennett, N. (1996). The role of justice judgments in explaining the relationship between job satisfaction and organizational commitment. *Group & Organization Management, 21*(1), 84-104. <https://doi.org/10.1177/1059601196211005>
- Mathieu, J. E. (1991). A cross-level nonrecursive model of the antecedents of organizational commitment and satisfaction. *Journal of Applied Psychology, 76*, 607–618. <https://doi.org/10.1037/0021-9010.76.5.607>
- Mathieu, J. E., & Chen, G. (2011). The etiology of the multilevel paradigm in management research. *Journal of Management, 37*, 610-641. <https://doi.org/10.1177/0149206310364663>
- Mathieu, J. E., Aguinis, H., Culpepper, S. A., & Chen, G. (2012). Understanding and estimating the power to detect cross-level interaction effects in multilevel modeling. *Journal of Applied Psychology, 97*, 951-966. <https://doi.org/10.1037/a0028380>
- Mathieu, J. E., & Taylor, S. R. (2007). A Framework for Testing Meso-Mediational Relationships in Organizational Behavior. *Journal of Organizational Behavior, 28*(2), 141–172. <https://doi.org/10.1002/job.436>
- Mathieu, J. E., & Zajac, D. M. (1990). A review and meta-analysis of the antecedents, correlates, and consequences of organizational commitment. *Psychological Bulletin, 108*(2), 171-194. <https://doi.org/10.1037/0033-2909.108.2.171>
- McNabb, C. B., & Murayama, K. (2021). Unnecessary reliance on multilevel modelling to analyse nested data in neuroscience: When a traditional summary-statistics approach suffices. *Current Research in Neurobiology, 2*, 100024. <https://doi.org/10.1016/j.crneur.2021.100024>
- Mearns, K., Hope, L., Ford, M. T., & Tetrick, L. E. (2010). Investment in workforce health: Exploring the implications for workforce safety climate and commitment. *Accident Analysis & Prevention, 42*(5), 1445-1454. <https://doi.org/10.1016/j.aap.2009.08.009>

JOB SATISFACTION AND ORGANISATIONAL COMMITMENT: A MULTILEVEL ANALYSIS

- Meier, L. L., & Spector, P. E. (2013). Reciprocal effects of work stressors and counterproductive work behavior: A five-wave longitudinal study. *Journal of Applied Psychology, 98*(3), 529–539. <https://doi.org/10.1037/a0031732>
- Menard, S. W. (2002). *Longitudinal research* (Vol. 76). Sage.
- Meyer, J. P., Allen, N. J. & Gellatly, I. R. (1990). Affective and continuance commitment to the organization: Evaluation of measures and analysis of concurrent and time-lagged relations. *Journal of Applied Psychology, 75*(6), 710–720. <https://doi.org/10.1037/0021-9010.75.6.710>
- Meyer, J. P. & Allen, N. J. (1991). A three-component conceptualization of organizational commitment. *Human Resource Management Review, 1*(1), 61–89. [https://doi.org/10.1016/1053-4822\(91\)90011-z](https://doi.org/10.1016/1053-4822(91)90011-z)
- Meyer, J. P., Stanley, D. J., Herscovitch, L., & Topolnytsky, L. (2002). Affective, continuance, and normative commitment to the organization: A meta-analysis of antecedents, correlates, and consequences. *Journal of vocational behavior, 61*(1), 20-52. <https://doi.org/10.1006/jvbe.2001.1842>
- Mitchell, T. R., & James, L. R. (2001). Building better theory: Time and the specification of when things happen. *Academy of Management Review, 26*(4), 530-547. <https://doi.org/10.2307/3560240>
- Morrow, P. C. (2011). Managing organizational commitment: Insights from longitudinal research. *Journal of Vocational Behavior, 79*(1), 18–35. <https://doi.org/10.1016/j.jvb.2010.12.008>
- Mottaz, C. J. (1987). An analysis of the relationship between work satisfaction and organizational commitment. *The Sociological Quarterly, 28*(4), 541-558. <https://doi.org/10.1111/j.1533-8525.1987.tb00311.x>

JOB SATISFACTION AND ORGANISATIONAL COMMITMENT: A MULTILEVEL ANALYSIS

- Mowday, R. T., Steers, R. M., & Porter, L. W. (1979). The measurement of organizational commitment. *Journal of Vocational Behavior*, *14*(2), 224–247. DOI: 10.1016/0001-8791(79)90072-1
- Mueller, C. W., Wallace, J. E., & Price, J. L. (1992). Employee commitment: Resolving some issues. *Work and Occupations*, *19*(3), 211-236.
<https://doi.org/10.1177/0730888492019003001>
- Muthén, L. K., & Muthén, B. O. (2017). Mplus: Statistical Analysis with Latent Variables: User's Guide (v8). California, USA. Muthén & Muthén.
- Nelson, D. L., & Quick, J. C. (2013). Organizational behavior: Science, the real world, and you. Cengage learning. ISBN: 9780357692882
- Nielsen, K., Randall, R. J., Yarker, J. & Brenner, S. (2008). The effects of transformational leadership on followers' perceived work characteristics and psychological well-being: A longitudinal study. *Work & Stress*, *22*(1), 16-32. DOI: 10.1080/02678370801979430
- O'Reilly, C. A., & Chatman, J. (1986). Organizational commitment and psychological attachment: The effects of compliance, identification, and internalization on prosocial behavior. *Journal of Applied Psychology*, *71*(3), 492. <https://doi.org/10.1037/0021-9010.71.3.492>
- Ployhart, R. E., & Vandenberg, R. J. (2010). Longitudinal research: The theory, design, and analysis of change. *Journal of Management*, *36*(1), 94–120.
<https://doi.org/10.1177/0149206309352110>
- Price, J. L. (1997). Handbook of organizational measurement. *International journal of manpower*, *18*(4/5/6), 305-558. <https://doi.org/10.1108/01437729710182260>
- Price, J. L., & Mueller, C. W. (1981). A causal model of turnover for nurses. *Academy of Management Journal*, *24*(3), 543-565. <https://doi.org/10.2307/255574>

JOB SATISFACTION AND ORGANISATIONAL COMMITMENT: A MULTILEVEL ANALYSIS

- Probst, T. M. (2010). Multi-level models of stress and well-being. *Stress and Health, 26*(2), 95-97. doi: 10.1002/smi.1313
- Qing, M., Asif, M., Hussain, A., & Jameel, A. (2020). Exploring the impact of ethical leadership on job satisfaction and organizational commitment in public sector organizations: The mediating role of psychological empowerment. *Review of Managerial Science, 14*, 1405-1432. DOI: 10.1007/s11846-019-00340-9
- Raudenbush, S. W. & Bryk, A. S. (2002). *Hierarchical Linear Models: Applications and Data Analysis*. 2nd ed. Sage Publications.
- Roznowski, M. (1989). Examination of the measurement properties of the Job Descriptive Index with experimental items. *Journal of Applied Psychology, 74*(5), 805-814.
<https://doi.org/10.1037/0021-9010.74.5.805>
- Sanders, E. A. (2011). *Multilevel analysis methods for partially nested cluster randomized trials*. University of Washington. ISBN-978-1-1246-0390-2
- Saridakis, G., Lai, Y., Muñoz Torres, R. I. & Gourlay, S. (2018). Exploring the relationship between job satisfaction and organizational commitment: an instrumental variable approach. *The International Journal of Human Resource Management, 31*(13), 1739-1769. <https://doi.org/10.1080/09585192.2017.1423100>
- Schleicher, D. J., Watt, J. D., & Greguras, G. J. (2004). Reexamining the job satisfaction-performance relationship: the complexity of attitudes. *Journal of Applied Psychology, 89*(1), 165-177. <https://doi.org/10.1037/0021-9010.89.1.165>
- Schunck, R. (2016). Cluster size and aggregated level 2 variables in multilevel models. A cautionary note. *Methods, data, analyses, 10*(1), 97-108.
<https://doi.org/10.12758/mda.2016.005>

JOB SATISFACTION AND ORGANISATIONAL COMMITMENT: A MULTILEVEL ANALYSIS

- Smith, P. C., Kendall, L. M. & Hulin, C. L. (1969). *The Measurement of Satisfaction in Work and Retirement: A Strategy for the Study of Attitudes*, Chicago: Rand McNally & Company.
- Sparrowe, R. T., & Liden, R. C. (1997). Process and structure in leader-member exchange. *Academy of management Review*, 22(2), 522-552. <https://doi.org/10.2307/259332>
- Stevens, J. M., Beyer, J. M., & Trice, H. M. (1978). Assessing personal, role, and organizational predictors of managerial commitment. *Academy of management journal*, 21(3), 380-396. <https://doi.org/10.2307/255721>
- Taris, T. W., & Kompier, M. A. (2014). Cause and effect: Optimizing the designs of longitudinal studies in occupational health psychology. *Work & Stress*, 28(1), 1-8. <https://doi.org/10.1080/02678373.2014.878494>
- Tett, R. P. & Meyer, J. P. (1993). Job satisfaction, organizational commitment, turnover intention, and turnover: path analyses based on meta-analytic findings. *Personnel Psychology*, 46(2), 259-293. <https://doi.org/10.1111/j.1744-6570.1993.tb00874.x>
- Thoresen, C. J., Kaplan, S. A., Barsky, A. P., Warren, C. R., & de Chermont, K. (2003). The Affective Underpinnings of Job Perceptions and Attitudes: A Meta-Analytic Review and Integration. *Psychological Bulletin*, 129(6), 914–945. <https://doi.org/10.1037/0033-2909.129.6.914>
- Tsai, Y. (2011). Relationship between Organizational Culture, Leadership Behavior and Job Satisfaction. *BMC Health Services Research*, 11(98). <https://doi.org/10.1186/1472-6963-11-98>
- Tsai, M. T., & Huang, C. C. (2008). The relationship among ethical climate types, facets of job satisfaction, and the three components of organizational commitment: A study of nurses in Taiwan. *Journal of Business Ethics*, 80, 565-581. <https://doi.org/10.1007/s10551-007-9455-8>

JOB SATISFACTION AND ORGANISATIONAL COMMITMENT: A MULTILEVEL ANALYSIS

- Valaei, N., & Rezaei, S. (2016). Job satisfaction and organizational commitment: An empirical investigation among ICT-SMEs. *Management Research Review*, 39(12), 1663-1694. <https://doi.org/10.1108/MRR-09-2015-0216>
- Vandenberg, R. J., & Lance, C. E. (1992). Examining the causal order of job satisfaction and organizational commitment. *Journal of Management*, 18(1), 153–167. DOI: 10.1177/014920639201800110
- Vandenberg, R.J. & Lance, C.E. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational research methods*, 3(1), 4–70. <https://doi.org/10.1177/109442810031002>
- Vandenberghe, C., Bentein, K., & Stinglhamber, F. (2004). Affective commitment to the organization, supervisor, and work group: Antecedents and outcomes. *Journal of vocational behavior*, 64(1), 47-71. [https://doi.org/10.1016/S0001-8791\(03\)00029-0](https://doi.org/10.1016/S0001-8791(03)00029-0)
- Weigl, M., Hornung, S., Parker, S. K., Petru, R., Glaser, J., & Angerer, P. (2010). Work engagement accumulation of task, social, personal resources: A three-wave structural equation model. *Journal of Vocational Behavior*, 77(1), 140-153. <https://doi.org/10.1016/j.jvb.2010.03.002>
- Williams, L. J., & Hazer, J. T. (1986). Antecedents and consequences of satisfaction and commitment in turnover models: A reanalysis using latent variable structural equation methods. *Journal of Applied Psychology*, 71(2), 219. <https://doi.org/10.1037/0021-9010.71.2.219>
- Xu, X., Zhao, P., Hayes, R., Le, N., & Dormann, C. (2023). Revisit the causal inference between organizational commitment and job satisfaction: A meta-analysis disentangling its sources of inconsistencies. *Journal of Applied Psychology*, 108(7), 1244–1261. <https://doi.org/10.1037/apl0001073>

JOB SATISFACTION AND ORGANISATIONAL COMMITMENT: A MULTILEVEL ANALYSIS

Zablah, A. R., Carlson, B. D., Donovan, D. T., Maxham, J. G. III, & Brown, T. J. (2016). A cross-lagged test of the association between customer satisfaction and employee job satisfaction in a relational context. *Journal of Applied Psychology, 101*(5), 743–755.
<https://doi.org/10.1037/apl0000079>

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Appendix A

Instructions to Authors - *Journal of Applied Psychology*

Formatting, structure and overall layout have been modified to adhere to the Journal's guidelines, while remaining practical for submission to meet the requirements of this assessment. Changes required before submission for publication will be made upon request and/or suggestion, as required.

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Appendix B

Job Satisfaction scale

Taking everything into consideration, to what extent are you satisfied with...

	Not at all	To a small extent	To a moderate extent	To a large extent	To a very large extent
1. Your job?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. The work that you do in your current job?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. The pay you currently receive (i.e. considering market rates, experience, position)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. The conditions that you work in (e.g. surroundings, facilities)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Your opportunities for promotion?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. The supervision you currently receive from your line manager?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. The people you work with?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. The training you receive?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. The way your career is developing at [organisation name]?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. The future direction of [organisation name]?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Your current level of balance between work and life commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

JOB SATISFACTION AND ORGANISATIONAL COMMITMENT: A MULTILEVEL ANALYSIS

Appendix C

Organisational Commitment scale

To what extent...	Not at all	To a small extent	To a moderate extent	To a large extent	To a very large extent
1. Do you understand how your role contributes to the overall direction of the organisation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Do you feel a sense of belonging?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Do you go 'above and beyond' what is required of you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Would you recommend [organisation name] to others as a place to work?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. Which of the following best describes your intentions for the future?

<input type="checkbox"/>	I would like to have a long-term career with [organisation name]
<input type="checkbox"/>	I will probably stay for at least another two years
<input type="checkbox"/>	I doubt I will be here for another two years
<input type="checkbox"/>	I am looking for opportunities outside of [organisation name]
<input type="checkbox"/>	I would like to retire within the next 5 years
<input type="checkbox"/>	I am unsure what my intentions are

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Appendix D

Mean OC and JS, T1-T3, within each nested work group

Work group	T1 OC	T1 JS	T2 OC	T2 JS	T3 OC	T3 JS
1	4.08	3.58	4.08	3.27	3.50	3.06
2	3.95	3.79	4.19	4.00	4.08	3.97
3	3.56	3.62	3.63	3.62	3.40	3.32
4	3.65	3.44	3.83	3.62	3.80	3.51
5	3.71	3.68	3.43	3.51	3.54	3.44
6	3.75	3.33	4.42	3.94	3.83	3.55
7	3.81	4.05	4.19	4.07	3.44	3.55
8	3.90	3.64	3.95	3.53	3.70	3.47
9	4.50	4.21	4.50	4.24	4.25	4.09
10	4.40	4.27	4.55	4.31	4.30	4.00
11	3.80	3.33	3.95	3.35	3.50	2.98
12	3.83	4.21	3.83	3.51	4.00	3.85
13	4.83	4.55	4.83	4.46	4.58	4.36
14	3.25	3.09	4.00	3.36	3.38	3.28
15	4.56	3.96	4.75	4.32	4.13	4.02
16	3.50	3.76	4.17	3.61	3.67	3.46
17	4.50	4.27	4.63	4.09	4.69	4.50
18	4.25	4.03	4.42	4.30	4.50	4.36
19	3.17	2.97	4.00	3.24	3.75	3.91
20	4.19	3.66	3.69	3.30	3.81	3.07
21	4.08	4.36	4.67	4.45	4.25	4.21
22	3.42	4.03	3.58	3.39	3.75	3.27
23	3.50	3.41	3.25	3.27	2.94	2.57
24	3.92	3.50	3.89	3.58	4.12	3.50
Total	3.92	3.78	4.10	3.76	3.87	3.64
SD	0.43	0.42	0.43	0.42	0.43	0.49