



RESEARCH PAPER

Demographic Moderators in the Work–Family Conflict and Cognitive Bandwidth Relationship: Evidence from Dual-Career Married Adults in Pakistan

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ABSTRACT

This study investigates how the relationship between work-family conflict (WFC) and cognitive bandwidth (CB) is moderated by gender, family system, employment type, years of marriage, and number of children among dual-career married adults in Pakistan. Cognitive bandwidth is the limited mental capacity available to manage daily demands. In dual-career households, especially in collectivist societies like Pakistan, family dynamics can influence how WFC affects mental resources. However, limited research addresses these effects contextually. Using a cross-sectional quantitative design, 400 married dual-career individuals were surveyed through purposive sampling. Standardized tools included the WFC Scale (Haslam et al., 2015) and a newly developed cognitive bandwidth scale. Demographic data were also collected. OLS regression with interaction terms tested moderation effects. Family system and number of children significantly moderated the WFC-CB relationship. Nuclear families and more children intensified the negative impact. Gender, employment type, and years of marriage were not significant. Culturally tailored workplace policies should support nuclear families with caregiving loads to preserve cognitive capacity and reduce burnout.

KEYWORDS

Work–Family Conflict, Cognitive Bandwidth, Demographics, Family System, Dual-Career Couples, Pakistan, Moderation Analysis

Introduction

Study of changing Department-Level Specialized Behavior in the dynamic social and economic environment of Pakistan indicates that the number of such families is growing in which both the members are fully employed and both parents work full time and have given up the dual-career situations. This change has increased the need to strike a balance between work and family (Shujaat et al., 2013). Work-family conflict (WFC) as an ensuing type of inter-role conflict at work (characterized by incompatible requirements of work and family domains that are mutually exclusive) is particularly threatening to the psychological functioning and cognitive efficiency in everyday life. Cognitive bandwidth (CB) is one of the most impacted constructs of this process; it is a phenomenon, which implies how much mental resources can be utilized to perform complicated thinking, decision-making, and emotional self-regulation (Mullainathan & Shafir, 2013). A rise in WFC has been linked to elevated stress levels, feeling pressed against time, and high levels of emotional fatigue, which is likely to severely hamper the capacity of an individual to utilize the available mental resources to address important targets, hence reducing the bandwidth of cognitive activity that the person can use to process daily decisions (Shaikh & Malik, 2020).

Despite the popularity of her research focus on WFC in psychological outcomes, little has been said about the moderating influence of the demographic variables on the relationship between the two. Family units and care giving, work patterns and cultures are highly varied within households in Pakistan. Such demographic diversity has the possible

effects on the experience and management of WFC among these individuals, but very little empirical research is available on the same.

Work-Family Conflict (WFC)

WFC can be described as any of the versions of role strain with involvement in one sphere (either work or family) becoming a hindrance to participation in another (Greenhaus & Beutell, 1985). It may be in two ways; work interfering with family (WIF) and family interfering with work (FIW). This paper employs the unidimensional WFC scale proposed by Haslam et al. (2015) that can be used among married persons who balance between parenting and working roles.

Cognitive Bandwidth (CB)

CB is mental capacity available at any particular time to an individual to take part of reasoning, planning, controlling the emotions, and getting things done (Mullainathan & Shafir, 2013). It is an exhaustible commodity, and we lose it because of some stressor like time poverty and emotional burden, which are typical products of high WFC.

Demographic Moderators

Such demographic variables as gender, family type (nuclear or joint), occupation type, the number of children, years of marriage are factored as moderators in this research. Such variables have an impact on the form and outcomes of WFC, since they add pressure or provide social and instrumental support (Michel et al., 2011; Perry-Jenkins & Wadsworth, 2017).

The psychological literature has emphasized on the role of contextual and structural factors in conditioning the effects of work family dynamics (Eby et al., 2005). However, saying the majority of the current studies are conducted on Western populations omitting the possible adaptation of this relationship to the South Asian context due to cultural demands and family arrangements and the care issue. However, in the distinct culture of Pakistan, wide-spread joint family, patriarchal work patterns and different degrees of child care load, it is essential to study the formation of the cognitive costs of WFC depending on demographic structures. The proposed study will seek to address this gap through empirically testing how certain demographical factors will moderate the correlation between WFC and CB on a purposive sample of dual-career married respondents in Pakistan. Study of these interactions will be used to make specific interventions, so workplace policies are more egalitarian and effective to accommodate a wide range of family and work arrangements.

Literature Review

Work-Family Conflict and Cognitive Bandwidth

The work-family conflict (WFC) has been identified to be a major predictor of frustration and reduced performance at both work and family life (Greenhaus & Beutell, 1985). It occurs when such work and family roles are incompatible to each other and this results in time-based conflict, strain-based or behavior-based conflict (Byron, 2005). The study shows that WFC will negatively affect the capacity of individuals to focus their attention, manage emotions, and demonstrate effective problem-solving, which are the main constituents of cognitive bandwidth (Mullainathan & Shafir, 2013; Shaikh & Malik, 2020). Although it has long been examined in the context of cognitive science and behavioral economics, cognitive bandwidth (CB) has become a focus of occupational health psychology to the extent that it relates to self-regulation and decision-making (Vohs et al., 2011). Overload and stress exhaust CB resulting in cognitive fatigue, myopic decision

making, and a lack of the ability to impose emotional control (Baumeister & Tierney, 2011). Therefore WFC is an important antecedent to cognitive depletion especially when family and work are high stakes. Nevertheless, it is expected that the picture of CB depletion might differ based on the contextual and personal factors that moderate or worsen the pernicious consequences of WFC.

Gender as a Moderator

The issue of gender norms especially plays an important part in the perception and the response of work-family stress by individuals. Women in collectivist and patriarchal countries such as Pakistan are most of the time placed under the pressure of careers and also being the primary caregivers (Ali & Agha, 2020). It has been revealed that women experience an increased risk of cognitive and emotional detriments of WFC, including an elevated level of stress, emotional burnout, and cognitive damage (Shockley et al., 2017). Nonetheless, certain studies indicate that gender does not linearly moderate the WFC-outcome connection given that at some locations, the role expectancy serves to cushion the experiences of men (Hammer et al., 2005).

Family System as a Moderator

The family structure almost acts as a mediator of the stressor impacts. There is a tendency to share the responsibility of caregiving and household with the extended family members in joint families, and this can reduce cognitive load associated with WFC (Jain et al., 2022). In contrast, the citizens within nuclear families will feel the overload effect on their roles, where a lack of social support is associated with a more acute CB depletion (Perry-Jenkins & Wadsworth, 2017). This buffering effect is indicated in the South Asian research setting, where collectivist types of support exert their buffering effect on reducing emotional stress (Shujaat et al., 2013).

Number of Children and Years of Marriage

The intensity of WFC and its outcome is directly dependent on the number of dependents. It has been found that when a family has more children, there is a connection to more cognitive load, greater parenting stress, and decreasing capacity to solve problems (Michel et al., 2011). Additionally, level of years in marriage can be used as proxy of role adaptation. Although shorter marital longevity lacks a stability and a common means of coping, it is also not subject to the increased burden over time based on stage of life and care duties as is the case of longer marital longevity (Voydanoff, 2005).

Employment Type

Boundary management between work and family can be influenced by the nature of employment i.e. formal, contractual, and self-employed. As an example, self-employed people experience demarcation in their roles, abnormal duties, and greater turnover in the economy, increasing WFC and lowering cognitive control (Kossek & Lautsch, 2012). On the other hand, secure job with fixed timetables may offer more chances of working out segmentation, maintaining mental space.

Theoretical Integration

The research is based on the Work-Family Interface Theory that originated in the study of Greenhaus and Beutell (1985) and presupposes to determine the spillover between work and family realms as the set of contextual resources and restrictions. In addition, mental resources required by people under competitive demands are defined by Cognitive Load Theory (Sweller, 1988) and how they apportion their limited mental

resources (Hobfoll, 1989). These models point out the necessity to learn about moderators that find out periods when WFC is most likely to consume cognitive bandwidth.

Although prior researchers have demonstrated that WFC has negative impacts on numerous psychological outcomes, little research has studied the demographic nature of the relationship between WFC and cognitive bandwidth, especially South Asian dual-career family members. The literature is bereft of culturally situated empirical evidence to prove or disprove the buffering function of extended family, gender norms and occupation structure on cognitive outcome. The study fills that gap by examining the conditions of differential moderation of gender, family system, employment type, number of children, and years of marriage among the Pakistani sample of the two-career couples.

Material and Methods

The present study employed a quantitative, cross-sectional survey design to examine the relationship between work-family conflict (WFC) and cognitive bandwidth (CB), and how this relationship is moderated by selected demographic factors: gender, family system, employment type, number of children, and years of marriage. This design was chosen to allow for the collection of standardized data across a large sample at a single point in time, enabling statistical analysis of interaction effects and group differences.

Participants

The sampling was of 400 dual career married adults (200 couples) living in big cities of Pakistan. Purposive sampling was done to ensure that the participants had representational value in the form of occupational difference, family organisation and care giving role. Each of the respondents was married and living with the husband, and involved in full-time occupation. The age was averagely 36.2 years ($SD = 5.7$) with 52 percent being male and 48 percent female. About 63 percent of them were raised in nuclear family, whereas 37 percent in joint families. The mean children per woman was 2.1 ($SD = 1.2$) and mean marital life was 9.4 years ($SD = 5.3$). The type of employment differed among government, privately employed and self employments.

Sampling Strategy

To be included the respondents had to ensure the following inclusion criteria: (1) the respondents were married, (2) both partners worked full-time, representing education institutions, corporate offices and government service departments in major Pakistani cities. A purposive sampling strategy was employed to recruit the respondents. The sampling strategy made the demographic variables chosen in this study moderation analysis variable.

Instruments

Work-Family Conflict (WFC) Scale

WFC was measured by the WorkFamily Conflict Scale with the scale consisting of 10 items (Haslam et al., 2015; 1 = strongly disagree, 5 = strongly agree). In this study, internal consistency of the scale was high (Cronbach 2 =.91).

Cognitive Bandwidth Scale

The cognitive bandwidth was also measured basing on a newly developed scale which was validated to specifically measure cognitive bandwidth of this study. To measure the scale, there were 38 items indicating mental clarity, mental fatigue, level of attention

span, and the ability to emotionally manage oneself. The ratings of items were based on a 7 point Likert scale. Internal consistency of the scale was also very high (Cronbachs alpha =.94).

Brief Self-Control Scale

Even though this paper does not analyze self-control, the Brief Self-Control Scale was used in the larger study (Tangney et al., 2004). The dataset used select items that were not used in this analysis.

Demographic Questionnaire

They reported demography in the form of gender, employment status, number of children, years of marriage and family system (joint system and nuclear and systems). They became moderators to these regression analyses.

Procedure

Depending on the access organization participants were recommended either to fill out the survey on-line or be given the survey in person. Required awareness of consent to participate was procured, and assurance of high confidentiality guaranteed. The process of the data collection took a period of two months. Institutional review board of the university in which the lead researcher is located approved ethical consideration. Information was de-identified and kept in a secure place.

Statistical Analysis

The ordinary least squares (OLS) regression was used to conduct moderation analysis, where each demographic factor was identified as a moderator in the WFC pointing to CB relationship. Dummy coding was used on categorical variables (e.g. gender, family system and employment). In the case of continuous moderators (e.g. number of children, years of marriage), the mean-centred interaction terms were calculated. Significant interaction effects were interpreted as evidence of moderation. The threshold for statistical significance was set at $p < .05$.

Ethical Considerations

This study was conducted in accordance with ethical guidelines for research involving human participants. Prior to data collection, ethical approval was obtained from the relevant institutional ethics review board. Participants were informed of the purpose of the study, the voluntary nature of their participation, and their right to withdraw at any point without any consequences.

A detailed informed consent form was provided to all participants, outlining the scope of the study, expected time commitment, data usage, and measures taken to ensure anonymity and confidentiality. Participants were assured that their responses would be used solely for academic purposes and that no identifying information would be disclosed in any reports or publications resulting from the research. To protect participant privacy, all survey responses were collected anonymously. Data were stored securely in password-protected files accessible only to the principal investigator. No physical, psychological, or social harm was anticipated or reported during the course of the study.

Results and Discussion

It was the purpose of the present study to examine the moderating role of some demographic attributes of the connection amid Work--Family Conflict (WFC) and

Cognitive Bandwidth (CB) in married adults with two careers in Pakistan. Namely, gender, family system, years of marriage, and number of children were considered as the potential moderators in this study. Interaction terms were used in the situation of moderation analysis in a linear regression framework.

Moderation Effect of Family System

There was also a strong moderation effect on family system, which resulted in the fact that the family form, namely, joint or nuclear family, has an impact on the effect produced by WFC in terms of cognitive bandwidth. The analysis performed showed that the interaction between WFC \times family system was significant, $\beta = -0.210$, $p = .0248$. This implies that the negative impact of WFC on CB is most notable in the nuclear family system, where the caring load is not shared out as in the joint family system, which is more of shared load and provision of emotional support. The conclusion provides insight into the idea that longer family surroundings present a way of social and structural cushioning, which can cushion the mental complexities of figuring out existence, between work and family.

Moderation Effect of Number of Children

Another considerable interaction was the value of number of children, $\beta = 0.215$, $p = .0102$. The findings reveal that the worse impact of WFC on cognitive bandwidth is pronounced as the children strand grows. This concurs with other literature that reports parenting requirements as one of the main causes of cognitive overload, especially where both parents work (Del Boca et al., 2020; Offer, 2014). Parents with children also have less time to recover and reflect which helps in less bandwidth to take up tasks in the area of attention, decision-making, and control of emotions.

Moderation Effect of Gender and Years of Marriage

Gender ($\beta = 0.125$, $p = .1835$) or years of marriage ($\beta = -0.052$, $p = .1521$) turned out to be not important moderators. These results suggest that even though these demographic aspects might affect the baseline rates of WFC or CB, they do not play a big role in changing the severity of the correlation between the two.

Table 1
Moderation Effects of Demographic Variables on the Relationship Between Work-Family Conflict and Cognitive Bandwidth

Moderator	Interaction Term	β	p	Significance
Family System	WFC \times Family System	-0.210	.0248	Significant
Number of Children	WFC \times Number of Children	-0.215	.0102	Significant
Gender	WFC \times Gender	0.125	.1835	Not Significant
Years of Marriage	WFC \times Years of Marriage	-0.052	.1521	Not Significant

A significant interaction term indicates that the demographic characteristic moderates the relationship between work-family conflict and cognitive bandwidth.

Discussion

This research paper involved the testing of how main demographic variables mediate the association between WorkFamily Conflict (WFC) and Cognitive Bandwidth (CB) among dual-career married couples in Pakistan. The study used theories of resource allocation, cognitive load, and work family interface, hence, our examination of the extent to which family system, number of children, gender, and years of marriage influence cognitive resource depletion of inter role conflict. The results shed valuable light on

psychological implications of demographic reality on users of dual-career in collectivistic cultures.

Family System as a Significant Moderator

The revelation of family system was the main moderating factor of this research study that was significant. The results of the study revealed to be more negative association between WFC and CB when it comes to participants who lived under nuclear families than joint family system. It aligns with the findings in prior studies that saw the need to place importance on long clan or family structures as a source of support in collectivistic societies, such as South Asia (Imran & Yasin, 2012; Kim & Park, 2006). The joint families usually contribute to the care-, emotional work and domestic management and thus help the dual-career individuals to have lesser burdens. These support mechanisms conserve mental faculties and does not cause bandwidth wastage, especially during the peak periods. This observation also concurs with the Conservation of Resources Theory (1989) by Hobfoll that people aim at conserving, preserving and accumulating resources. Where joint family settings provide resource-pooling arrangements, whether of time, emotional sustenance, or physical care provision, they will avoid the vortex of loss of cognitive resources that WFC is inclined to generate. Therefore, family structure turns out to be a situational factor, which increases or decreases the effects of interrole conflict on mental functioning.

Number of Children as a Significant Moderator

In the same vain, number of children played a major modifying factor in the relationship between WFC and CB. Parents who had higher child tally demonstrated a weaker bandwidth of thought when actual work and family conflict were high. The identified phenomenon is further confirmed by the evidence provided by previous studies that have shown parenting, in general, and having multiple children, in particular, necessitating extensive emotional control, decision-making, and multitasking, all of which pose cognitive loads (Nomaguchi & Milkie, 2020; Offer & Schneider, 2011). The more children have, the more obligations in schools, emotional support, and organizational discipline are usually required, particularly in a family where both parents are working. The finding is an echo of those by Del Boca et al. (2020) carried out during the COVID-19 pandemic when working parents with more than one child reported high levels of burnout and mental exhaustion because of boundary blurring and over-multitasking. In current study, we have found that under dual role demands number of children is a powerful stressor leading to an increase in cognitive depletion, the effect of which is true even in non-pandemic contexts.

Gender and Years of Marriage as Non-Significant Moderators

Contrary to initial expectations, **gender** did not significantly moderate the relationship between WFC and CB. While many studies report higher WFC among working women due to traditional caregiving expectations (Eby et al., 2005; Ahmad, 2011), the lack of significant interaction in this study may suggest a shifting cultural norm among Pakistan's urban dual-career couples. Men may be increasingly involved in domestic roles, or the cumulative effects of dual employment may affect both partners similarly—leading to comparable cognitive consequences across genders. Alternatively, it is possible that societal norms still expect women to manage both roles but that such expectations are so internalized that the cognitive cost appears normalized rather than exaggerated.

Additionally, **years of marriage** did not significantly moderate the WFC–CB relationship. It was hypothesized that more years of marriage might build resilience or shared understanding that buffers against cognitive strain. However, no significant effects were found. This suggests that longevity in marriage does not necessarily reduce the

cognitive cost of balancing work and family roles. Instead, factors such as communication quality, marital satisfaction, and adaptability might play a greater role in buffering WFC than duration alone (Voydanoff, 2005).

Conclusion

This paper examined the moderating effects of demographic predictors on the relationship that exists between WorkFamily Conflict (WFC) and Cognitive Bandwidth (CB) in a sample of dual career married couples in Pakistan. The findings indicate that the family structure and the number of children influence the cognitive facility available to an individual tremendously due to WFC. Namely, members of nuclear families and those with higher numbers of children develop a higher depletion of mental bandwidth in the presence of high work-family conflict. On the contrary, years of marriage and gender did not indicate any strong moderation influences. These results support the emerging understanding that the cognitive health condition of working adults is not only determined by the professional conditions in which they are working but also depend on demographic and relationship conditions, that they are operating. Although the so-called one-size models of wellness are frequently pursued by organizations, the current study raises awareness about the need of context-sensitive and demographically sensitive interventions in order to safeguard employee performance and overall well-being.

Recommendations and Practical Implications

Organizational Policy and Flexibility

Organizational shall contemplate on the provision of differentiated policies to employees considering the family obligations (including flexible hours, hybrid work arrangements, and childcare plans, particularly when there is a nuclear family, two children, and so on).

Bandwidth-Aware Management

There are additional solutions such as the Cognitive Bandwidth Inventory that employers and HR professionals can incorporate into their normal check-up of the well-being of employees. This can assist in determining workers who are likely to become overworked before poor performance or mental illnesses occur.

Support for Nuclear Families

In societies that have the culture of joint families who supported each other, workers in nuclear structures might be without backup systems. This gap can be filled through the provision of organizational alternatives like parenting workshops, peer support group and virtual family counseling.

Employee Assistance Programs (EAPs)

EAPs must focus at WFC concealed cognitive expenditures and customize resources (i.e., cognitive behavioral mentoring, contemplation, and chronological management improvement) to family units.

Inclusive Leadership Training

Managers are to be trained on how WFC presents variable demographically and react to it with understanding and being adaptive, being empathetic, yet one that considers personal responsibilities of the management personnel transparently.

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