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Effects of Flexibility on Digital Platform-Mediated Work in Five Ibero-American Countries

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Abstract: This study aimed to characterize digital platform-based work arrangements in regard to their degrees of flexibility and their effects on professional achievement, balance between pros and cons, and perception of risk. A survey was conducted with platform-based workers in Argentina, Brazil, Chile, Colombia, and Spain (e.g., transport, care and cleaning, content production, and house renting). Two thousand and forty-eight workers contacted through social networks and unions participated. Based on the factorial analysis, we propose a flexibility index covering five dimensions (contractual agreement, working hours, workplace, remuneration, and union ties). After controlling for covariates, the flexibility index was used in a regression to measure its effects on professional achievement, the balance of pros and cons, and risk perception. The digital workers with the highest flexibility scores worked in transportation and the trade of goods and services. Flexibility reduces professional achievement when the worker accesses platform jobs due to a lack of alternatives.

Keywords: digital worker; flexibility; intercultural study; digital platforms; gig work forms

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1. Introduction

Organizational and Occupational Psychology (OWP) is mainly devoted to studying work as a type of intentional human activity aimed to transform reality, supported by a stable, long-term, full-time employment relationship, with social and rights protection (Antunes 2018, 2020; Rentería and Malvezzi 2018). This perspective, however, has proven to be considerably distant from the current reality. In several countries, new labor arrangements have emerged as a result of changes in labor laws and the incorporation of new technologies into the intermediation of workers, users/beneficiaries, and employers/contractors in the exchange of goods and services (Ajunwa and Greene 2019; Prassl 2018).

The gig economy encompasses this scenario and is characterized by temporary jobs, short-term contracts, and freelancers. Digital intermediation platforms have facilitated the expansion of this scenario (Srnicek 2017). Short-term or task-based service contracts (Keith et al. 2020), intermediated by apps installed on smartphones or computers, have grown exponentially in recent years and have become alternatives for the unemployed, underemployed, or those eager to find alternatives to conciliate work and family (Pesole et al. 2018; EU-OSHA 2018; ILO 2018, 2021).

The number of service apps has expanded and diversified (e.g., transportation, specialized professionals, food) (e.g., Carneiro et al. 2023). In this context of new arrangements, work is allocated anywhere, breaking space-time boundaries and removing the visible face of the employer/contractor (Filgueiras and Antunes 2020).

Digital platforms offer workers the possibility of accepting work demands and performing them at different times and places. On the other hand, these platforms may worsen the uncertainty of employment bonds due to insufficient fixed income and loss of social protection, security, and other benefits granted in the formal labor market. Although labor intermediation platforms have arisen out of recent technological advances, in terms of worker's obligations and duties, they resemble unsteady work arrangements that have existed for centuries, especially in underdeveloped countries (ILO 2018). The situation is worsened because digital platforms have greatly expanded their domain, being used in multiple specialized services, such as education, health, and the rental of spaces. Several forms of labor exploitation and of products and services supply have become more sophisticated, supported by the concept of flexible arrangements.

These users, whose labor activity and exchange of goods and services are mediated by digital platforms, are called digiworkers (Moscon et al. 2022). Although in this type of arrangement the number of workers and users fully or partially involved is hard to estimate, by 2020 they were expected to reach close to 100 million at the global level (Ramalho et al. 2020). This number is currently believed to be even higher, as restrictive measures to contain the COVID-19 pandemic have served as a springboard for the global expansion of platform-mediated work and services in terms of users, diversification of supply (Henderson 2020), and the number of registered workers (Van Zoonen and Sivunen 2021).

According to the International Labor Organization (ILO) (ILO 2018), there are two types of digital platform-mediated jobs. In the first one, crowdwork, work is supplied and performed entirely remotely (Gol et al. 2019), free of any geographical barrier. The demand for a service or task is made available on the platform, so any registered professional can apply to perform it, often unaware of who the contractor is. Thousands of websites of commercial organizations are powered by crowdwork platforms on which people are hired to produce short texts, revoking their right to authorship; thus, they assume the identity of anonymous taskers. Despite the prevalence of simpler, piecemeal, and monotonous tasks, also classified as microtasks (De Stefano 2016), crowdwork activities vary in complexity, time spent by the worker, and financial return, and they can encompass more elaborate projects, sometimes similar to those hired in traditional jobs, such as writing a book (Schulte et al. 2020).

In contrast, the platform is used when working on-demand-via-app only to establish contact and rule forms of delivery, such as transportation, maintenance, cleaning, and carriage services. This second type of digiwork is more visible since it involves the provision of a local service (on-site) intermediated by the digital platform. This type of work arrangement is also known as the "Uberization of Work" (Fleming 2017; De Stefano 2016).

Although in practice such arrangements have become quite usual, theorizing about the economy and labor relations that operate through online platforms is still in its early stages. This brings about a need for empirical studies aimed both to characterize digiwork to know their dysfunctions and imbalances and to offer inputs for the proposition of theoretical models on their relationships with variables relevant to organizational and work psychology (Rentería and Malvezzi 2018). Moreover, although it is a global phenomenon, the contexts in which digiwork exists in each country may interfere with its social and economic impact on workers.

In this sense, the empirical study described in this article was based on samples from five Ibero-American countries. South America, Argentina, Brazil, Chile, and Colombia participated, while Spain participated in the Iberian Peninsula. The main objective was to characterize the many groups of digiworkers in their respective countries in terms of their degrees of flexibility (contract/agreement, working hours, location, bonds with trade associations and collectives, etc.). We also aimed to identify the effects of this flexibility

on variables related to the workers' satisfaction with their actual experience, such as professional achievement, balance between pros and cons, and perception of physical and mental risks.

Furthermore, we sought to evaluate the interaction of flexibility with volition, which refers to the individual's perception of their "possibility to make professional choices and decisions, despite the constraints imposed by the person's external environment" (Pires and Andrade 2022, p. 1, free translation). The average of becoming a digiworker (by choice or not) was considered a key variable in this study. It is imagined that the voluntary choice of digiworkers to be part of this type of professional arrangement helps to mitigate the potential harms of flexibility.

Flexibility in Alternative Work Arrangements

According to Spreitzer et al. (2017), the central axis for the analysis of alternative work arrangements is flexibility, which should be considered in three dimensions when compared to the classic model of employment contracting: in job relation (direct, agency, temporary contracts), in working hours (fixed, variable—exemplified by on-call or standby—and on-demand), and in where the work is performed (telework, home-office, etc.). Based on the combination of these different possibilities, Spreitzer et al. (2017) classified workers into groups: standard workers (full-time); standard workers with flexible hours; standard workers with flexible locations; part-time workers; on-demand workers; agency/outsourced workers; self-employed workers; and workers with platform-mediated contracts. This last category encompasses workers who gather a high level of flexibility in all three dimensions (contract, time, and location). These workers are hired via digital platforms for specific, short-term tasks that can be performed virtually or at the client's premises.

The complexity of digiwork and of other work arrangements that are emerging in contemporaneity made us include the two following dimensions of flexibility additionally to those described by Spreitzer et al. (2017): (1) income earned by the worker and (2) ties with collective associations. The income dimension is justified by the relevance of financial return to ensure survival and quality of life. The dimension of ties with collective representation entities was included because it is assumed that membership in associations would be lower in the absence of a formal labor bond since the benefits of such membership are not clearly visible.

Therefore, we address five dimensions of flexibility in this study that are expected to contribute to broadening the understanding of specificities and convergences that characterize the many digiworker groups, especially in some Ibero-American countries. The frailty of laws on workers' rights—especially in the countries of the South American continent—ends up intensifying the risks of exploitation of some digiworker groups, distinguishing them from those in more developed countries and also from those who use the platforms to advertise their services (spaces for rent and more qualified specialized professional activities) and sell their products.

2. Materials and Methods

2.1. Study Design and Sample

This is an empirical, quantitative, cross-sectional study. Data were collected between March and December 2021—during a peak period of the COVID-19 pandemic. The collection was both online and on-site and targeted workers registered at digital platforms. Participants from the five countries (Argentina, Brazil, Chile, Colombia, and Spain) were accessed in a non-probabilistic way through emails sent to academic networks, personal contacts of the researchers, and workers' unions. Personal or institutional social media groups (Facebook, Instagram, Twitter) focused on topics related to digital platform-based work were other means of dissemination. The survey was self-administered through an invitation to be completed via link or in a printed format. The survey was disseminated using the snowball strategy (Biernack and Waldorf 1981), so those who received the invitation were asked to pass it on to potential respondents. A total of 2048 workers participated,

with 40.5% from Colombia, 27.1% from Spain, 22.8% from Chile, 5.4% from Brazil, and 4.2% from Argentina. Of the total, 51.7% were men, 46.5% were women, and 1.7% did not answer or classified themselves in the "other" category. Only 1.5% of the participants indicated having some form of disability.

Table 1 discloses detailed information on variables such as gender, age, educational level, and type of digiwork entry by country. The digiworkers were mainly youngsters, as in four countries 70% were under 35 years old, except for Brazil, where a greater dispersion of age was observed. In Brazil and Argentina, participants were mostly men, while, in the other countries, there was greater parity between both genders. In Colombia, the participation of women was even higher than that of men. In most countries, the basic education level (primary) comprised the lowest number of cases. Digiworkers with a basic education level (primary or less) are marginal; the world of work mediated by platforms seems to be populated by educated individuals, at least with a middle education. The diversity between countries appears most evident in the secondary education level groups. In Colombia and Chile, they represent 25%, while in Brazil and Argentina, this ratio doubles. Spain shows a different scenario, where digiworkers are less educated than in Latin American countries, with a higher proportion of individuals with secondary education.

Table 1. Characterization of the sample by sociodemographic and professional variables.

Variables	Argentina (n = 85)	Brazil (n = 111)	Chile (n = 467)	Colombia (n = 829)	Spain (n = 556)	Total (N = 2048)
Gender (%)						
Woman	27.1	28.2	46.9	53.0	42.8	46.5
Man	69.4	71.8	52.0	44.7	55.6	51.7
Other	3.5	0.0	1.1	2.2	1.6	1.7
Age in years (%)						
<25 years	41.2	28.8	48.2	51.7	45.7	47.6
26–35 years	29.4	27.1	24.7	26.2	30.0	27.1
36–45 years	16.5	24.3	11.7	11.2	12.1	12.3
46–55 years	5.8	15.3	11.1	8.7	9.1	9.6
56–65 years	3.6	1.8	4.8	2.2	2.9	3.0
≥66 years	3.5	2.7	0.4	0.0	0.2	0.4
Education level (%)						
Up to primary education	1.2	5.41	1.72	1.22	4.32	2.4
High school	42.35	37.84	22.10	25.40	50.45	32.81
University or superior	56.47	56.8	76.13	73.38	45.23	54.8
Choice (%)						
Personal Decision	45.2	54.1	74.0	80.9	75.2	74.8
Employer's Decision	0.0	13.5	8.4	10.0	5.2	8.1
Lack of job alternatives	54.8	32.4	17.6	9.2	19.6	17.1

Source: research data.

About 75% of the study participants in Chile, Colombia, and Spain entered digiwork due to personal choice. This ratio is much lower than in Brazil and Argentina, where it ranged from 45% to 55%. Entry for organizational decision was marginal among the countries, except in Brazil, where the percentage reached 13%.

Weekly workload devoted to digiwork, the number of registration platforms, and the income share in family expenses were not included in the analyses of this study, but they serve for the general characterization of the total sample, allowing for the contextualization of findings. The workload devoted to digiwork and the number of registration platforms varied between countries. Up to 30 h prevailed in Colombia (66%), Chile (62.7%), and Spain (59%). From 31 to 44 h or more prevailed in the samples from Argentina (61.9%) and Brazil (54%). In Argentina, there was a prevalence of those who were linked only to one platform (76.2%), followed by Spain (64.1%) and Chile (54.8%). In Colombia, 29.4%

were affiliated with four or more platforms, followed a little farther by Brazil (12.6%). In Argentina (69.75%), Brazil (59.4%), and Colombia (56.9%), digiwork was the main source of income for household expenses. In Chile (69.5%) and Spain (78.6%), income from digiwork proved to be complementary or not counted toward coping with household expenses.

This study is part of a research project called Digiwork: Understanding the World of Digital Platform-Mediated Work, approved by an Ethics Committee in Brazil. All workers consented to their free and informed participation before completing the survey.

2.2. Measures

To measure the degree of flexibility of work arrangements, six multiple-choice questions were prepared and included in the survey. Job relation, working hours, and work location were variables based on the classificatory model of Spreitzer et al. (2017). We also added the income (fixed or variable) and membership in associations of collective representativeness to the calculation base.

To assess job relation, two questions were included: one focusing on the characteristics of contracts/agreements in terms of time, the other on the characteristics of contracts/agreements in terms of the task. Specific questions were designed for each of the other four dimensions (time, place, income, and membership). Each question was evaluated on alternatives that ranged in three levels of flexibility (0, 1, and 2). Alternatives varied in levels of flexibility. Factor analyses performed indicated adequacy of the one-factor model (CFI = 0.974; TLI = 0.961; RMSEA = 0.061) (α = 0.72).

To facilitate interpretation, the score was standardized to a 0–1 scale. The flexibility score could range from 0 (inflexible) (exclusive dedication, indefinite contract, inflexible schedule, in-company work, fixed income, and membership of a collectively representative association) to 1 (maximum flexibility) (variable work time, by specific project, on-demand schedule, mixed workplace or on the street, variable income, and no membership of a collectively representative association).

Next, three questions were included on the digiworker's relationship with this work arrangement using Likert-type response scales (ranging from 0 to 10): (1) professional achievement with the work arrangement, (2) balance of pros and cons of the work arrangement, and (3) perceived risk of the work arrangement. A categorical question was included to assess the volitional nature of entering the current work arrangement, and participants could indicate that their work situation stemmed from (1) their own choice; (2) the decision of the hiring organization; or (3) a lack of alternatives.

2.3. Data Processing and Analysis Procedures

The study participants were organized into five groups, considering the type of activities that bound them to digital platforms: (1) transportation (of people or products); (2) household services (care, maintenance, cleaning, etc.); (3) online production (content, software, entertainment, and microtasks); (4) specialized services (consulting, health, education); and, (5) trade in goods and services (renting or selling products). The first two categories comprised workers who performed their activities on-site and were intermediated by digital platforms (work-on-demand-via-app), while the last three categories performed their activities predominantly online (crowdwork).

Descriptive statistics allowed us to characterize the peculiarities of the different groups of digiworkers regarding the key variables for the five countries. An ANOVA (analysis of variance) was performed to compare the levels of flexibility in the work arrangements of the five different groups of digiworkers. Tests were non-parametric, such as Kruskall−Wallis, considering that the size of the samples by country and digiworker groups was very unequal.

Multiple linear regression analyses allowed us to measure the relation between flexibility and the three variables of the digiworker's relation with the work arrangement (professional achievement, balance of pros and cons, and perceived physical and mental risk). Control variables were included to capture differences in worker perceptions that were not fully explained by the flexibility score. The form of entering into digiwork (per-

sonal choice, company decision, and lack of alternative), age, gender, educational level, digiworker groups, and country were controlled. We further tested whether the type of digiwork entry could moderate the effect of flexibility on professional achievement, the balance of pros and cons, and perceived risk. Considering that these three variables (professional achievement, balance, and perceived risk) took on values from 0 to 10 and can be considered as continuous dependent variables, they were estimated with ordinary least squares and standard errors robust to heteroscedasticity.

The common method variance (CMV) was tested across indicators using Harman's one-factor test method. In this approach, a method factor is created consisting of all indicators. If they show high levels of shared variance, variance is considered to be a consequence of the method—as in this case survey type, which jointly used antecedent, consequent, and moderator variable metrics (Fuller et al. 2016; Podsakoff and Organ 1986). The CMV did not prove to be a problem in this study.

All analyses were conducted in R 4.2.2, using the following packages: jmv 2.3.4, lavaan 0.6-11 and ggplot2 3.4.1.

3. Results

3.1. Characterizing the Digiworkers' Samples in the Five Countries

Table 2 shows the means and standard deviations of the study's antecedent variable (flexibility) and the three consequent variables on the digiworker's relation with the work arrangement (professional achievement, balance of pros and cons, and perceived risk) in the five groups of digiworkers and the countries evaluated.

Table 2. Characterization of the key variables studied, by country and by group of digiworkers.

Variables(1)	Argentina (X/SD)	Brazil (X/SD)	Chile (X/SD)	Colombia (X/SD)	Spain (X/SD)	Total (X/SD)
Flexibility						
Transport	0.72 (0.16)	0.60 (0.22)	0.74 (0.17)	0.50 (0.23)	0.74 (0.23)	0.64 (0.24)
Household services	0.47 (0.00)	0.16 (0.00)	0.58 (0.25)	0.36 (0.13)	0.61 (0.24)	0.57 (0.25)
Production	0.71 (0.13)	0.47 (0.44)	0.60 (0.28)	0.47 (0.23)	0.53 (0.26)	0.52 (0.26)
Specialized Services	0.67 (0.21)	0.42 (0.31)	0.49 (0.24)	0.36 (0.19)	0.55 (0.27)	0.45 (0.25)
Trade	0.74 (0.13)	0.78 (0.00)	0.66 (0.28)	0.56 (0.27)	0.73 (0.24)	0.62 (0.27)
TOTAL	0.72 (0.15)	0.54 (0.27)	0.62 (0.25)	0.47 (0.24)	0.64 (0.26)	0.56 (0.26)
Professional Achievement						
Transport	5.23 (2.11)	6.11 (2.44)	4.63 (3.00)	6.45 (2.15)	4.80 (2.57)	5.57 (2.59)
Household services	6.00 (0.00)	9.00 (0.00)	6.00 (2.82)	6.00 (2.79)	5.98 (2.27)	6.02 (2.30)
Production	6.67 (2.35)	7.00 (1.41)	5.94 (2.37)	7.14 (1.89)	6.51 (2.33)	6.66 (2.20)
Specialized Services	8.67 (0.58)	7.00 (2.77)	7.71 (2.16)	6.90 (2.14)	7.45 (1.65)	7.15 (2.07)
Trade	5.45 (1.21)	7.00 (0.00)	6.67 (2.20)	6.79 (2.14)	6.03 (2.14)	6.55 (2.12)
TOTAL	5.56 (2.11)	6.44 (2.53)	5.83 (2.74)	6.73 (2.12)	5.92 (2.51)	6.25 (2.43)
Pros and cons balance						
Transport	6.07 (1.33)	6.09 (1.82)	5.76 (2.02)	6.79 (2.04)	5.19 (1.78)	6.08 (2.02)
Household services	8.00 (0.00)	7.00 (0.00)	6.59 (1.84)	6.18 (2.52)	6.13 (1.75)	6.35 (1.86)
Production	7.44 (1.51)	7.00 (0.00)	6.74 (1.51)	7.39 (1.86)	6.66 (1.53)	7.02 (1.71)
Specialized Services	9.00 (1.00)	7.04 (1.59)	7.26 (1.58)	7.13 (2.09)	6.96 (1.46)	7.13 (1.78)
Trade	7.55 (1.04)	6.00 (0.00)	6.24 (1.95)	7.14 (2.12)	6.65 (1.61)	6.96 (1.98)
TOTAL	6.56 (1.51)	6.40 (1.76)	6.47 (1.88)	7.03 (2.05)	6.06 (1.81)	6.59 (1.96)
Perceived Risk						
Transport	7.14 (1.38)	8.60 (2.00)	6.78 (2.59)	5.89 (2.93)	6.01 (2.16)	6.36 (2.64)
Household services	6.00 (0.00)	5.00 (0.00)	4.55 (2.71)	5.36 (3.01)	3.67 (2.43)	4.23 (2.63)
Online Production	4.00 (2.69)	1.50 (2.12)	3.28 (2.72)	4.82 (2.69)	2.77 (2.60)	3.80 (2.81)
Specialized Services	6.33 (1.53)	3.54 (3.27)	3.02 (2.54)	4.51 (2.98)	2.69 (2.59)	3.61 (2.90)
Trade	4.09 (2.07)	8.00 (0.00)	4.76 (3.19)	4.32 (2.92)	3.41 (2.70)	4.21 (2.88)
TOTAL	6.33 (2.11)	6.87 (3.44)	4.72 (3.12)	5.15 (2.96)	4.22 (2.85)	4.93 (3.03)

Source: research data. The flexibility score ranges from 0 to 1, with 0 being inflexible and 1 being very flexible. The other variables were evaluated on a Likert-type scale ranging from 0 to 10.

The ANOVA results show that countries differ in the mean flexibility of the total digiworker groups (F = 57.19; *p*-value < 0.01). The highest mean in flexibility is observed in Argentina [X = 0.719 SD = 0.152)], followed by Spain [X = 0.634 SD = 0.263] and Chile [X = 0.620 SD = 0.250]. Even among these three countries, differences are significant (F = 5.76; *p*-value < 0.01). This result holds even if the number of observed cases differs from the expected ones (Kruskal–Wallis Test X2 = 210.06; *p*-value < 0.01).

When considering only the transportation and "trade in goods and services" (e.g., Airbnb) digiworkers groups, the mean flexibility shows a slight increase and the differences between the three countries disappear (F = 0.27; *p*-value 0.765). This indicates that these groups are more flexible. The same is true when only transportation digiworkers are considered. When analyzing flexibility in each country in the trade digiworkers group, means across countries do not differ significantly, except for Colombia, which again suggests lower flexibility (Kruskal–Wallis Test X2 = 1.246; *p*-value = 0.742). Despite the limitations of the digiworker *groups'* representativeness across countries, the mean flexibility differs, especially in the digiworker groups involving home economics, online production, and specialized services. These groups are less flexible than those in transportation and trade and specialized services, although they show quite a bit of heterogeneity. This result suggests that differences in flexibility across countries stem from the type of digiwork.

On professional achievement, the ANOVA results in the group of specialized services digiworkers point to no significant differences between countries (F = 1.79, *p*-value = 0.13). This may be due to the imbalance of cases in this group among the countries, especially in Argentina (n = 3) and Brazil (n = 26), since significance appears (F = 8.25, *p*-value < 0.01) when heteroscedasticity is admitted, indicating that the different sample sizes and the diversity of contexts in each country may be hiding differences. The same occurs when comparing only the countries with more cases, namely Chile, Colombia, and Spain. Similarly, the results become significant (F = 3.25, *p*-value = 0.04) when heteroscedasticity is admitted.

With regard to the overall balance of pros and cons of digiwork arrangement, the group of specialized services digiworkers was the only one that showed significant differences across countries. When heteroscedasticity is assumed, the ANOVA results are significant in the comparison of the five countries (F = 4.43, *p*-value < 0.01), but it is restricted only to Chile, Colombia, and Spain, as they have a higher number of cases than Brazil and Argentina.

Finally, regarding the perception of physical and mental risk of this type of work arrangement, the average of digiworkers working in transportation shows up to 2.75 points above other sectors (6.36 vs. 3.61), suggesting that such a difference is significant (t = 19.8, *p*-value < 0.01) regardless of country. The manuscript is organized in subsections considering the objective formulated in this study. First, we seek to characterize the different work arrangements and service provisions via digital platforms (digiwork) in the five participating countries, differentiating them in their degrees of flexibility. Second, we review how digiworkers perceive the effects of flexibility on their professional achievement, the balance of pros and cons of the work arrangement, and the perceived physical and mental risks. We also tested the moderating role of the form of entry into digiwork (volition) in regard to the relation between flexibility and variables related to career prospects.

3.2. Effects of Flexibility on Professional Achievement, Balance of Pros and Cons, and Perceived Risk and the Moderating Role of Entry in Digiwork

Harman's one-factor test method, applied to all observed variables used in the moderation model, evidenced that 25% of the variables' variance was shared among all variables, indicating that CMV is not an issue in this study. Thus, other analyses could be performed with reliability.

Taking all countries together, flexibility was weakly and moderately correlated with the variables of professional achievement (−0.285; *p*-value < 0.01), overall balance (−0.241; *p*-value < 0.01), and perceived risk (0.141; *p*-value < 0.01). Therefore, it showed effects on all

three variables (professional achievement, overall balance of pros and cons, and perceived risk) in all digiworker groups. However, since simple correlation omits moderating effects of other variables, multiple regression analyses were run to control such effects.

Table 3 presents the regression analyses results, controlling for variables including the interaction between the form of digiwork entry and flexibility on the three outcome variables. Considering all observations together, flexibility of work arrangement appears to decrease professional achievement ($\beta = -1.60$; $p < 0.01$) and the overall balance of pros and cons ($\beta = -0.94$; $p < 0.01$). Flexibility also increases risk perception ($\beta = 0.93$; $p < 0.01$). In this sense, higher levels of flexibility lead digiworkers to perceive that they are more exposed to risks due to this work arrangement, less professionally fulfilled, and less satisfied with their evaluation of the pros and cons regarding this work arrangement.

Table 3. Regression analysis and moderation of digiwork entry on the relation between flexibility and professional achievement, overall balance, and perceived risk.

	Professional Achievement		**Overall Balance**		**Perceived Risk**	
	β	***p***	**B**	***p***	**B**	***p***
Flexibility	−1.60	<0.01	−0.94	<0.01	0.93	<0.01
Choice (Reference=personal choice)						
Organization's Determination	−0.97	0.01	−0.48	0.13	0.60	0.18
Lack of *Opportunity*	−0.28	0.55	−0.33	0.41	0.92	0.07
Flexibility # Choice Organization's Determination	1.87	0.03	0.53	0.54	−0.75	0.49
Flexibility # Choice Lack of Opportunity	−1.28	0.05	−0.84	0.12	0.05	0.95
Gender (Reference = woman)						
Man	0.17	0.13	0.01	0.94	0.33	0.02
Other	0.50	0.45	0.23	0.62	1.43	0.06
Age	0.01	0.08	0.01	0.19	0.01	0.13
Education (Reference = until primary education)						
Secondary Education	0.15	0.64	0.26	0.29	−0.29	0.32
Higher Education	0.07	0.83	0.25	0.32	−0.26	0.39
Country (Reference = Argentina)						
Brazil	0.24	0.60	−0.47	0.11	0.38	0.42
Chile	−0.58	0.04	−0.74	<0.01	−0.39	0.12
Colombia	0.06	0.83	−0.39	0.03	0.24	0.34
Spain	−0.41	0.12	−1.08	<0.01	−0.99	<0.01
Digiworkers Group (Reference = transportation)						
Household services	0.67	0.01	0.51	0.01	−1.44	<0.01
Production	0.80	<0.01	0.69	<0.01	−2.11	<0.01
Specialized Services	1.12	<0.01	0.69	<0.01	−2.26	<0.01
Trade in Goods	0.71	<0.01	0.63	<0.01	−1.89	<0.01
N	1834		1834		1834	
R^2	**0.17**		**0.15**		**0.21**	

Note: Robust standard errors in brackets.

The results indicate that there is moderation between flexibility and professional achievement when taking into account the type of entry into digiwork ($\beta = 1.87$; $p = 0.03$) and lack of opportunities ($\beta = -1.28$; $p = 0.05$). In other words, although the direct effect of flexibility is negative for professional achievement when considering its interaction with

digiwork entry, this effect can be attenuated and become slightly positive. This occurs when entry was due to the organization's determination. However, this attenuation does not occur when the entry was due to lack of opportunity, because the negative effect on professional achievement increases. In brief, flexibility has different impacts on professional achievement depending on the type of entry the worker takes into digiwork. Figure 1 presents the effect of moderation on professional achievement and makes evident that lack of alternatives has the greatest effect on decreasing professional achievement.

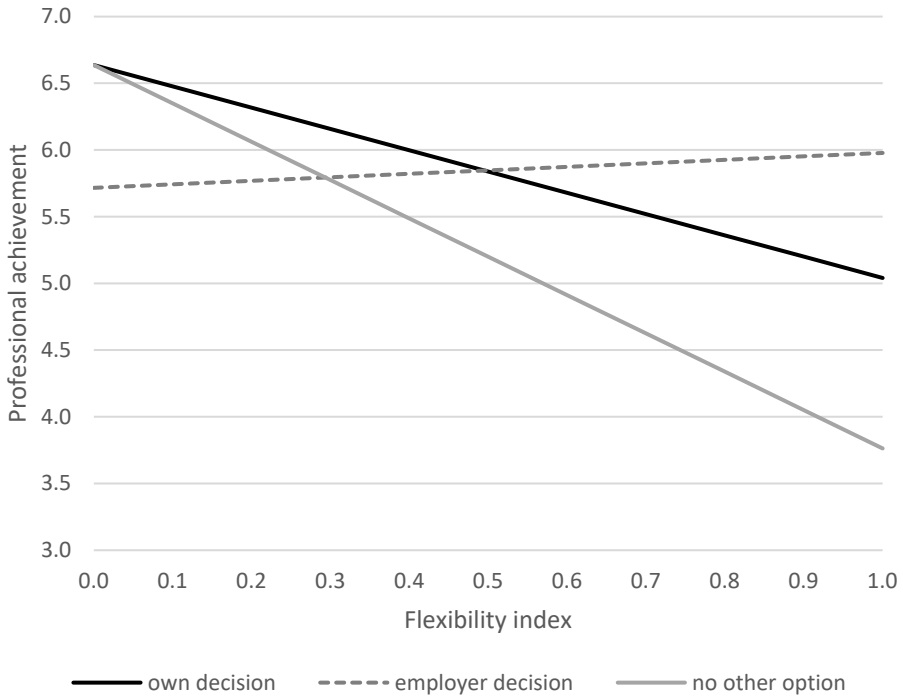


Figure 1. Effect of flexibility on professional achievement.

Men report higher perceived physical and mental risks than women ($\beta = 0.33$; $p = 0.02$). Based on the ANOVA results, professional achievement does not show great differences between countries, with the exception of Chile (0.58; $p = 0.04$) (Table 3). The overall balance is perceived as worse in Spain, Chile, and Colombia in comparison to Argentina ($\beta = -1.08$; $\beta = -0.74$ and $\beta = -0.39$, respectively with $p < 0.05$). The perception of physical and mental risk seems to be lower in Spain in comparison with the other countries ($\beta = -0.99$, $p < 0.01$).

Differences were identified between groups of digiworkers regarding perceived professional achievement, balance of pros and cons, and perceived risk. Those engaged in transportation show worse results when compared to the other groups. The best results are among those who perform higher-skilled activities (specialized services and online content production), followed by "trade in goods and services" and home economics (care, cleaning). This ranking is the same for the three variables of worker−work relation (professional achievement, perception of physical and psychological risks, and balance of pros and cons).

4. Discussion

This study was mainly intended to characterize digiworker groups from five Ibero-American countries, differentiating them in their degrees of flexibility. The results suggest that there are more similarities than differences in the perception of digiworker groups in different countries, pointing out a work arrangement that crosses geographical boundaries.

Flexibility is more intensively perceived among those who work in the trade of goods and services (renting or selling products) and in the transportation sector (people and products), at opposite poles. The first group encompasses those who have a good or service they want to offer and use the platform to intermediate their business. They are possibly in a slightly more advantageous situation. The second group comprises those who offer

their labor force, with more risks of being exploited due to their low power of bargaining with the platform owners or administrators. In summary, the digiworker groups oscillate between autonomy and subordination to the dictates of the platforms, although with differentiated statuses.

Transportation digiworkers, despite using their right to attend or not, face a higher risk of being punished by the platform without prior sustainable justification (Carneiro et al. 2023; Graham et al. 2017; Howcroft and Bergvall-Kåreborn 2019; Rosenblat 2018; Wood et al. 2018). This is due to their greater vulnerability (financial need, high competitiveness, easy replacement, etc.). Thus, the platforms seem to reproduce differences in social and occupational status as well. Although the two above-mentioned groups showed similar levels of flexibility, in the group related to trade and rental activities, such flexibility was predominantly the result of worker's choice, while in the transportation group, the entry predominantly emerged from a pushing force.

Concerning the three digiwork-related attitudinal variables, results also pointed to more convergences than divergences. In Argentina, Chile, and Spain, the perception of professional achievement is higher among digiworkers in specialized services (consulting, health, education), who are supposed to be groups that are more skilled, with higher educational levels. In Brazil, professional achievement was shown to be most visible in household services digiworkers (care, maintenance, cleaning, etc.), which historically comprise highly precarious services in the country (Carneiro et al. 2023). In Colombia, professional achievement stands out in those active in online production (content, software, entertainment, and microtasks). Digiworkers in specialized services (consulting, health, education) also perceived a better balance of pros and cons under this work arrangement, except in Colombia, where such a perception was most evident among digiworkers in online production (content, software, entertainment, and microtasks). Finally, convergence was more evident in regard to the perception of physical and mental risks, as, in all countries, digiworkers working in transportation (people and products) presented higher means.

This overall result suggests that some digiworker groups tend to be more associated with flexible work arrangement conditions, while this affiliations is less so in others. Although all digiworker groups work based on the intermediation of digital platforms, the fact that they have different working conditions with such platforms points to the need to better understand how these groups that shape the digiwork universe are characterized; there is also a need to investigate the impacts on workers and those who use this form of intermediation to offer their goods and services (ILO 2018).

The second objective was to test the effects of flexibility on professional fulfillment, the balance between pros and cons, and perceived risks (physical and mental). The third objective was to evaluate the interaction of flexibility with the circumstances of entry into the digital work regime (moderating effect). A positive effect was observed when considering that entry into this type of arrangement was the result of the organization's determination. This input mode protects the digiworker from the negative effects of flexibility. In the case of entry motivated by a lack of job opportunities, the effect on professional fulfillment is even worse when compared to entry motivated by personal choice. It should also be noted that the interaction between flexibility and the type of entry into digital work had no effect on the variables of perceived risk and the balance between pros and cons; thus, it was not observed that the potential harm of flexibility would be mitigated in the case of voluntary choice.

One reason that may explain these results is related to the period of data collection during the peak of the COVID-19 pandemic, in which organizations led their workers to use digital platforms as a way of coping with the limitations imposed by government measures that restricted mobility (ILO 2022). The worker's attachment to the platform would be temporary, so that flexibility would not have negative consequences in regard to professional achievement. Therefore, it should be asked whether it would be correct to describe this group as a digiwork group, because they are workers with formal bonds to the organization, having temporarily migrated to the platforms in order to keep working.

In this case, the negative consequences of flexibility would be hidden and would show up in those digiworkers orphaned from the protection of formal organizational bonds.

It is worth noting that entry for determination of the organization was a minority (8%) among the three options given and occurred mainly in specialized services and online production, with 85% of the workers holding a degree. For this segment, greater flexibility may be contributing to improvements in the work−family−personal life balance and free time management.

As such, although there is evidence in the literature that personal choice acts as a predictor variable of worker's well-being in alternative work arrangements, minimizing their potential negative effects (Berger et al. 2019; Spreitzer et al. 2017; Tran and Sokas 2017), the results of this study signaled that personal willingness for entering digiwork is of greater complexity, especially considering the circumstantial variables that lead the worker to resort to this type of arrangement.

In summary, the study advances by bringing evidence that the five Ibero-American countries seem to share several social, economic, and labor relation issues, disclosing more similarities than differences in the way digital platforms work. The division of labor and effective organizational management that make jobs mediated by digital platforms invisible and hyper-controlled require detailed studies on the type of tasks (heterogeneity) and the working conditions they offer (Rosenblat 2018).

We recognize two main limitations in our study. The first is the form of information collection, mainly via a self-administered survey and with only a single point measure at an atypical moment in time that characterized the world's adaptation to the COVID-19 pandemic, which had many effects on people's lives and ways of keeping working. The second was the difference in sample sizes within each country, limiting the possibilities for comparative analyses.

A third limitation is related to the gender issue, given its historical role in the social division of labor. Results point to a higher perception of physical and mental risk among men than women. Although its significance has been marginal due to the low number of observations in some groups, there are signs of the need to carry out specific studies on minority groups and their forms of labor insertion, which are subject to more precarious and unsafe conditions. This study did not include an analysis of the challenges of reconciling work and other spheres of life, in view of the fact that women are more exposed to work overload, since domestic and care work are reserved for them.

5. Final Remarks

This study sought to provide empirical inputs to help understand and better theoretically characterize the many arrangements on labor intermediation and exchange of goods and services in digital platforms (digiwork) in five countries. Despite there being more similarities than differences in the characterization of these digiworker groups and the numerical inequality of these groups in each country, there is an upward trend across national borders, suggesting a global rather than local movement. However, it is noteworthy that digital intermediation platforms seem to reproduce the same conditions of inequality that already exist in the world of work. The group of digiworkers devoted to transportation (of people and products) is far more vulnerable to the effects of flexibility, which may subject them to more precarious working conditions and a sometimes arbitrary subordination of those operating the platform when compared to the group of digiworkers who have more personal, professional, and social resources and make use of the platforms to expand their market reach. However, in between these two groups, there are just as many others in intermediate positions who are exploited by more sophisticated forms of intermediation. This movement in tension between the groups and the increasing sophistication of technologies adopted by the platforms is leading the world of work to a new level of complexity that is not easily captured at theoretical and empirical levels.

The spread of platform-based work, especially after the COVID-19 pandemic, has brought disruption in all aspects: labor, social, psychosocial, regulatory frameworks, etc.,

driven by the development of the Revolution 4.0 tools. This requires a new conceptual and theoretical paradigm that rigorously addresses its legal, social, personal, family implications, and even the implications for the modes of sociability and organization of the economy.

This study aimed to understand the effects of the many forms of flexibility that have assumed relevant status in work via digital platforms and harbor an ambivalent meaning in the current world of work. We found empirical support for the argument that, today, flexibility is a core factor in the analysis of work arrangements (Spreitzer et al. 2017) but still demands further exploration.

We acknowledge some practical implications emerging from our study. First, we stress the importance of taking into account contextual variables in future research and organizational interventions to better understand how different countries incorporate global trends in the world of work. When heterogeneity is admitted, some variables prove to be significant. Although this is a global movement, considering the context may increase the chances of effective public and organizational policies in each country.

The literature (e.g., Berg et al. 2018) already suggests the need for platforms to establish and create strategies to enforce codes of conduct to their members, as many of these workers (transportation digiworkers, for example) are not protected by collective bargaining agreements and conventions. A better understanding of their needs and perspectives on their work and future may be important when defining what would be decent, dignified, and acceptable in this type of work arrangement.

Another practical implication is the possibility of presenting data that will help policymakers to propose and improve the legal−administrative regulation of digital platforms. It is a minefield, as it involves a very unequal game of forces between platform owners, government, civil society, and workers (Moscon et al. 2022).

New research horizons are opening up to include other variables with the potential to contribute to explaining the current complex world of work. Immigrants have also been trying to occupy this intermediation space in the countries to which they migrate, competing with the natives. Studies about the effects on mental health also open new explanatory possibilities that could sophisticate the models and compare groups of digiworkers.

Further analysis is needed regarding the legal implications, administrative changes, and the level and severity of precariousness that lurk behind these work arrangements. Digital platforms are circumscribed to macro-structures that are under the responsibility of states and governments. This is what Schor et al. (2020) called the removal of control, which emphasizes the lack of regulation of the platforms' dynamics by the state which, added to the country's socioeconomic conditions, pushes the worker into a compulsory adherence that reproduces and worsens inequalities in working conditions.

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