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Creativity, Choice and Flexibility at Work: Variations in Autonomy Orientation among Agricultural Researchers in Punjab

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ABSTRACT

This study examined differences in autonomy orientation among researchers working in agricultural research institutions in Punjab, Pakistan. Autonomy orientation was conceptualized through three work characteristics: having an interesting job, working in an environment that encourages creativity and innovation, and having flexibility in choosing work projects. Data were collected from 329 researchers through stratified sampling. The psychometric properties of the autonomy orientation scale were assessed using item loadings, communalities, internal consistency, composite reliability, and variance inflation factors. Descriptive statistics were calculated for marital status and job designation groups. Because group variance assumptions were not presumed to be equal, Welch's one way analysis of variance was employed to examine differences in autonomy orientation, followed by Games–Howell post hoc comparisons. The findings demonstrated statistically significant differences in autonomy orientation across marital status groups. Single respondents reported the highest autonomy orientation, followed by married and divorced respondents, with all pairwise differences statistically significant. Significant differences were also observed across job designations. Scientific officers reported significantly higher autonomy orientation than both senior scientists and principal scientists, whereas the difference between Principal and Senior Scientists was non-significant. The findings highlight meaningful variation in autonomy oriented work experiences across social and organizational groups.

Keywords: autonomy orientation, marital status, job designations, researchers, Welch ANOVA

INTRODUCTION

Work is not only a way to make a living, but also a significant social context in which people use their skills, make choices, create ideas and feel a sense of self determination (Wheatley, 2017). These dimensions are especially relevant in research related careers, where workers are required to create knowledge, find solutions to complex problems, devise new methods and strategies, and meet evolving scientific and organizational needs (Brodeur & Dupont, 2006; Carolan, 2006; Cortada, 2009; Davenport, 2005). When this is the case, the degree of autonomy that employees have in their work could influence their attitudes toward their work and their occupational environment (Van Den Broeck et al., 2016; Wang & Li, 2022). Autonomy oriented work allows workers the freedom to make decisions, to be creative, to choose, and to have some influence over what they are doing and what projects they are working on (Wheatley, 2017; White et al., 2023; Yimer et al., 2024).

Similarly, autonomy is especially relevant in jobs that involve intellectual activity and creativity (Eccles et al., 1991; Fazey & Fazey, 2001; Gagné, 2003; Gillet et al., 2012). For instance, agricultural researchers are engaged in problem identification, scientific solutions, investigation, new knowledge creation and agricultural practice improvement. This is more than just the mechanical performance of work assigned (Batool et al., 2023; Shahzad et al., 2023; Shahzad, Batool, Anjum, et al., 2024). They tend to include independent thinking, creativity, innovation and decision making regarding research activities. Therefore, a work environment that provides researchers with a sense of interesting work, creativity, innovation and flexibility can help foster a sense of autonomy (Shahzad, Batool, Anjum, et al., 2024; Shahzad, Batool, & Sajid, 2024; Shahzad et al., 2025).

In the present study, autonomy orientation is defined as orientation toward work that offers opportunities for intellectual interest, creativity, innovation and choice or organization of work projects (Gagné, 2003; Gillet et al., 2012; Goštautaitė et al., 2019). It therefore embodies aspects of work that enable workers to have some control and autonomy over their work. An interesting job can help to encourage intellectual engagement, while opportunities for creativity and innovation can allow employees to build and implement their own ideas (Lechner et al., 2017; Levy et al., 2008; Littman Ovadia et al., 2013; Lorence & Mortimer, 1985). Likewise, the freedom to select work projects can offer employees more flexibility in the direction and content of their work. These are all key elements of an autonomy oriented work experience (Horiguchi, 2021; Jutz et al., 2018). But not all employees may have the same kind of work experience that is autonomous. People have various social roles and organizational roles, and these roles could affect how much flexibility, discretion and opportunity they are afforded for creative expression (Van Den Broeck et al., 2016; White et al., 2023). The nature of the employee's position in the organization may have an impact on the level of responsibility, authority and decision making authority that they have, and their personal circumstances may have an impact on how they experience and negotiate their work (Wang & Li, 2022; White et al., 2023).

One social factor that could hold relevance for employees' experiences at work is marital status (Alcover & Topa, 2018). There may be a distinction between marital status groups in terms of family responsibilities, social obligations, time investment and expectations regarding the work family relationship (Cavanagh et al., 2020; Dutra Thomé et al., 2019; Eccles et al., 1991). These differences can affect the importance placed on flexibility and discretion in the job (Gillet et al., 2012; Goštautaitė et al., 2019). Such differences, however, are not assumed to be either direction or magnitude, and must be examined empirically. Another source of variation that could be important is job designation. The responsibilities, decision making authority, participation in research planning, and the capacity to start or lead research projects may vary among researchers with different designations (Brodeur & Dupont, 2006; Carolan, 2006; Cortada, 2009). These differences in organizational position can, therefore, be manifested in the work experiences of employees in terms of autonomy oriented work. Against this background, the present study examines whether autonomy orientation differs according to marital status and job designation among researchers working in agricultural research institutions in Punjab.

LITERATURE REVIEW

Autonomy Orientation in Research Work

Importance of autonomy in contemporary work is that it gives employees the opportunity to make choices, act independently and make decisions in the execution of their work duties (Davenport et al., 2002; Douthwaite & Gummert, 2010; Erickson et al., 2018; Greene & Myerson, 2011). When employees can make a difference in how they do their work and when they can add their own ideas, they are more likely to see their work as meaningful to them (Blackler, 1995; Brodeur & Dupont, 2006; Carolan, 2006). In jobs that require independent thinking, rather than following a rigid set of procedures, autonomy is especially

important (Wang & Li, 2022; Wheatley, 2017; White et al., 2023). One of these occupational contexts is research work. The researchers often face problems for which there are no ready made solutions. They are required to ask questions, choose methods, formulate ideas, consider options, and adapt what they are doing based on their discoveries (Carolan, 2006; Cortada, 2009; Davenport, 2005; Davenport et al., 2002). Thus, a workplace that allows creativity, innovation and flexibility is likely to be significant for researchers' experiences at work. Autonomy orientation can thus be seen as one significant aspect of research oriented work.

The three facets of work, interesting job, job that encourages creativity and innovation and flexibility in choosing work projects, are used to measure autonomy orientation in the present study. Interesting jobs are jobs that are intellectually and stimulating (Arnon, 2012; Barakabitze et al., 2015). Creativity and innovation is an opportunity to create and apply new ideas and flexibility in work projects is an opportunity to exercise discretion and choice (Davenport et al., 2002; Douthwaite & Gummert, 2010). Together, these traits reflect an attitude toward work where workers are not confined to routine or imposed work.

Autonomy Orientation and Marital Status

Work experiences are part of the workers' social life. Marital status can be a key dimension of a person's social status as it may be linked to family responsibilities, domestic duties, expectations in relation to others, and the allocation of time between work and personal life (Takyi & Broughton, 2006). These circumstances may influence the ways employees perceive and value different characteristics of their jobs (Nie et al., 2015; O'Donoghue & Van Der Werff, 2022; Okada, 2023). Flexibility in project selection of work might be especially significant for some employees as it can offer more opportunity to manage work and personal responsibilities (Slemp et al., 2018; Su & Reeve, 2011; Vite et al., 2024). For some, creative and intellectually challenging activities may be more integral to their occupations. Thus, marital status may be correlated with differences in the nature of autonomy related aspects of work experiences.

However, marital status does not affect a person's work preferences or experiences (Hagger & Hamilton, 2021; Su & Reeve, 2011; Yu et al., 2018). The organizational context for each researcher may be similar, and there may be a significant difference between groups of researchers in the same marital status category (Nie et al., 2015; Okada, 2023; Su & Reeve, 2011). Thus, it is better to empirically investigate whether there is a difference in autonomy orientation by marital status group than to make an assumption about the direction of difference. Based on this reasoning, the following hypothesis is made:

H1: There are statistically significant differences in autonomy orientation based on marital status.

Autonomy Orientation and Job Designation

Employees' autonomy can also be influenced by their position within an organization. Job designations frequently reflect variations in job responsibilities, skills, knowledge, and authority, as well as expectations for supervision, decision making, and participation in organizational activities (Eccles et al., 1991; Fazey & Fazey, 2001; Gagné, 2003; Gillet et al., 2012). These differences could impact the extent of employee influence on their work, project selection, creativity, and/or the way specific responsibilities are tackled (Alcover & Topa, 2018; Cavanagh et al., 2020; Goštautaitė et al., 2019).

The importance of job designations may be particularly strong in agricultural research institutions (Shahzad et al., 2023; Shahzad, Batool, Anjum, et al., 2024; Shahzad, Batool, & Sajid, 2024). Researchers can be involved in various ways in the development of research proposals, prioritizing research, supervising research activities, distributing research responsibilities, and decision making for research projects at different organizational levels. Discretion may be different for employees with more specific

responsibilities than for those with more organizational responsibility (Carolan, 2006; Cortada, 2009; Davenport, 2005; Davenport et al., 2002). However, formal designation does not always lead to greater autonomy as informal aspects of the work experience such as institutional practices, supervisory relationships, organizational rules and resources may also influence actual experiences (Blackler, 1995; Cortada, 2009; Erickson et al., 2018). Therefore, it is meaningful to investigate whether researchers have different experiences of autonomy oriented work characteristics based on the job designation. Comparing designations can show if there are systematic differences between groups or if autonomy orientation is distributed in a similar way across organizational positions. The conceptual discussion in the existing literature thus serves as a starting point for exploring job designation as a potential source of variation in autonomy orientation. Therefore, the second hypothesis can be stated as:

H2: There are statistically significant differences in autonomy orientation based on job designation.

METHODOLOGY

Research Design and Participants

The study employed quantitative cross sectional research design. The research was conducted among researchers working in agricultural research institutions in Punjab. A stratified sampling technique was used to obtain representation from the relevant categories of researchers. The final sample consisted of 329 respondents. Moreover, autonomy orientation was measured using three items representing important characteristics of autonomy oriented work: (1) an interesting job, (2) a job that encourages creativity and innovation, and (3) flexibility in choosing work projects (Jutz et al., 2018). These items gauge three complementary dimensions of autonomy oriented work: intellectual interest, opportunities for creative and innovative expression, and discretion in selecting work activities or projects. The items were assessed using the study's adopted response scale, and their psychometric properties were examined before conducting the group comparison analyses.

Data Analysis

Data analysis was conducted in three stages. First, the psychometric properties of the autonomy orientation scale were assessed to establish the reliability and adequacy of the measurement. Second, descriptive statistics were calculated to summarize respondents' autonomy orientation scores. Third, Welch's one way ANOVA was used to examine whether autonomy orientation differed significantly across marital status and job designation groups. Welch's ANOVA was selected because it provides a robust alternative to conventional one way ANOVA when the assumption of equal variances across groups is not satisfied. Where the Welch test indicated statistically significant overall differences, Games–Howell post hoc comparisons were conducted to identify differences between individual groups. The Games–Howell procedure is appropriate when group variances and sample sizes may differ because it does not require the assumption of equal variances. Reporting both the omnibus Welch test and the complete Games–Howell comparisons therefore provides a more transparent assessment of whether autonomy orientation varies across the demographic and occupational groups examined in the study.

RESULTS AND DISCUSSIONS

Measurement Model and Psychometric Properties

Table 1					
Items, Loadings, Reliability and Collinearity of Autonomy Orientation Scale					
Items	**λ**	**Communality**	**Alpha**	**CR**	**VIF**
WE			.836	.833	
AO1	.864	.746			1.920
AO2	.878	.771			2.050
AO3	.864	.747			1.922
Note: CR = composite reliability, VIF = variance inflation factors, λ = loadings					

The psychometric properties of the autonomy orientation Scale were first examined to establish the adequacy of the measure. As presented in Table 1, the three items demonstrated strong factor loadings, ranging from .864 to .878. Specifically, AO1 loaded at .864, AO2 at .878, and AO3 at .864 on the underlying autonomy orientation construct. The corresponding communalities ranged from .746 to .771, indicating that approximately 74.6% to 77.1% of the variance in the individual items was explained by the underlying construct. These findings indicate that all three items made strong contributions to the measurement of autonomy orientation. The scale also demonstrated good internal consistency, with Cronbach's alpha reported at .836 and composite reliability at .833. These values exceed commonly accepted thresholds for satisfactory internal consistency, indicating that the three items consistently represented the underlying construct. In addition, the variance inflation factor values ranged from 1.920 to 2.050, which are comfortably below conservative thresholds for problematic multicollinearity. Thus, the measurement results provide evidence that the Autonomy Orientation Scale had satisfactory reliability and acceptable collinearity properties.

Descriptive Statistics of Autonomy Orientation

Table 2								
Descriptive Statistics of Autonomy Orientation Across Various Marital Statuses and Job Designations								
Variables	**N**	**Mean**	**S. D**	**S. E**	**95% CI for Mean**		**Minimum**	**Maximum**
					Lower Bound	Upper Bound		
Marital Status								
Single	60	11.80	2.238	.289	11.22	12.38	8	15
Married	240	7.48	2.405	.155	7.17	7.78	3	14
Divorced	29	6.34	1.518	.282	5.77	6.92	4	9
Job Designation								
Principal Scientist	14	5.21	2.326	.622	3.87	6.56	3	8
Senior Scientist	154	6.71	1.977	.159	6.39	7.02	3	12
Scientific Officer	161	9.82	2.722	.215	9.40	10.24	5	15

Descriptive statistics for autonomy orientation across marital status and job designation groups are presented in Table 2. Among the marital status groups, single respondents reported the highest level of autonomy orientation (M = 11.80, SD = 2.24), followed by married respondents (M = 7.48, SD = 2.41) and divorced respondents (M = 6.34, SD = 1.52). The 95% confidence intervals were [11.22, 12.38] for single respondents, [7.17, 7.78] for married respondents, and [5.77, 6.92] for divorced respondents. The descriptive pattern suggests substantial differences in autonomy orientation across the three marital status groups, with single respondents reporting considerably higher scores than both married and divorced respondents. Autonomy orientation also varied descriptively across job designation groups. Scientific Officers reported the highest mean score (M = 9.82, SD = 2.72), followed by Senior Scientists (M = 6.71, SD = 1.98) and Principal Scientists (M = 5.21, SD = 2.33). The corresponding 95% confidence intervals were [9.40, 10.24], [6.39, 7.02], and [3.87, 6.56], respectively. Thus, the descriptive results indicate that Scientific Officers reported substantially higher autonomy orientation than the two other designation groups.

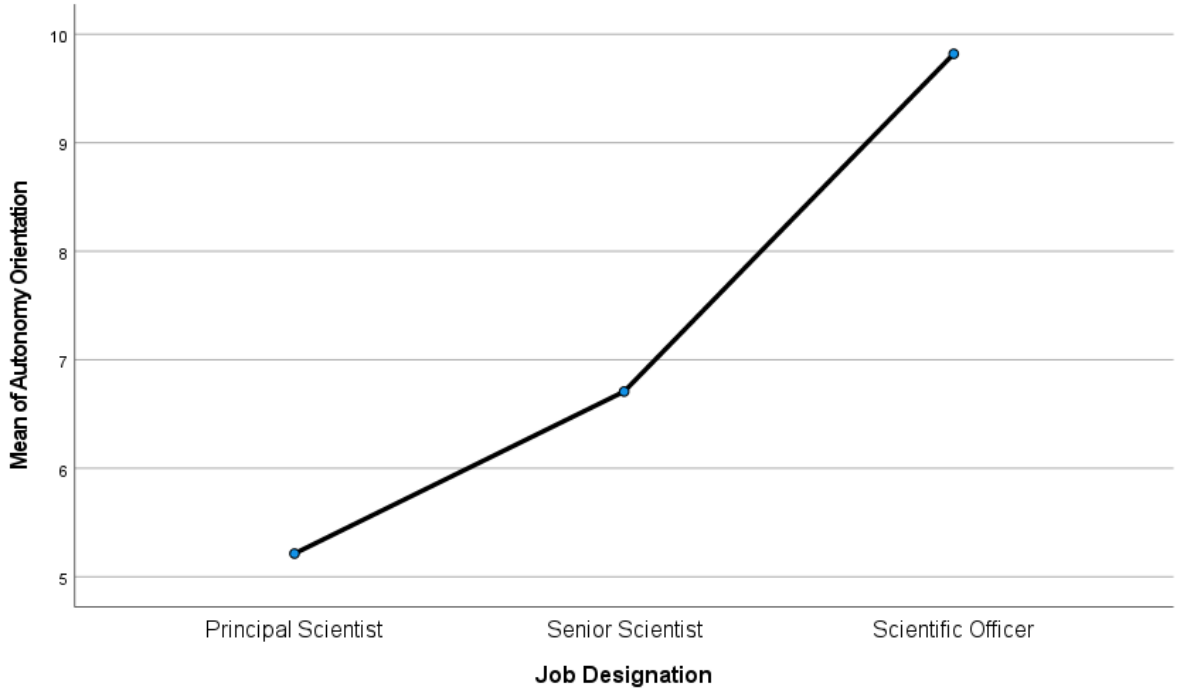

Figure 1: Visual Summary of Autonomy Orientation Based on Job Designation

Differences in Autonomy Orientation by Marital Status

Table 3				
Welch's ANOVA for Autonomy Orientation by Marital Status and Job Designation				
Independent variable	**Welch's *F***	**df1**	**df2**	***p***
Marital status	108.30	2	75.44	< .001
Job designation	74.81	2	35.81	< .001

Welch's one way ANOVA was conducted to determine whether the observed differences in autonomy orientation across marital status groups were statistically significant. As shown in Table 3, the analysis revealed a statistically significant effect of marital status on autonomy orientation, Welch's $F(2, 75.44) = 108.30$, $p < .001$. This finding indicates that the mean autonomy orientation scores were not equivalent

across the three marital status groups. Therefore, H1 was supported. Because the omnibus Welch test was statistically significant, Games–Howell post hoc comparisons were conducted to determine which marital status groups differed from one another. All three pairwise comparisons were statistically significant. Single respondents scored significantly higher than married respondents, with a mean difference of 4.32 points, *SE* = 0.33, 95% CI [3.54, 5.10], $p < .001$.

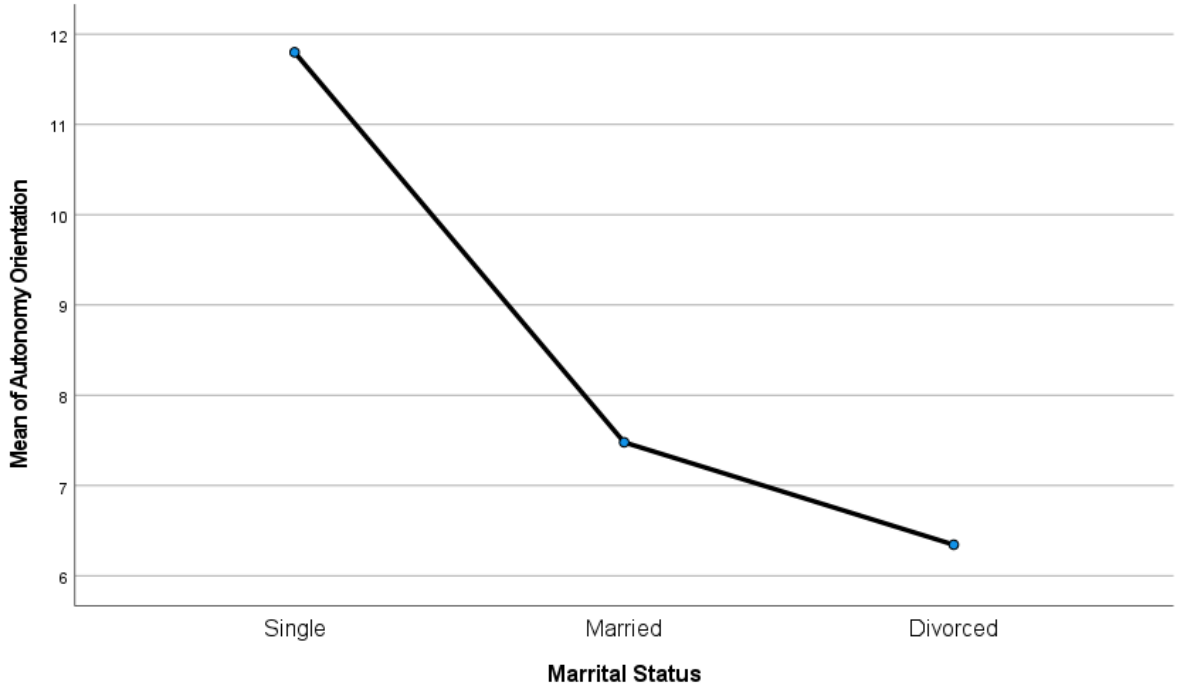

Figure 2: Visual Summary of Autonomy Orientation Based on Marital Status

Single respondents also scored significantly higher than divorced respondents, with a mean difference of 5.46 points, *SE* = 0.40, 95% CI [4.49, 6.42], $p < .001$. Finally, married respondents scored significantly higher than divorced respondents, with a mean difference of 1.13 points, *SE* = 0.32, 95% CI [0.36, 1.91], $p = .003$. Thus, the post hoc analysis demonstrates a consistent ordering of group means, with single respondents reporting the highest autonomy orientation, followed by married respondents and then divorced respondents.

Differences in Autonomy Orientation by Job Designation

Welch's ANOVA results also indicated statistically significant differences in autonomy orientation across job designation groups, Welch's F (2, 35.81) = 74.81, $p < .001$. This result indicates that autonomy orientation differed significantly among Principal Scientists, Senior Scientists, and Scientific Officers. Accordingly, H2 was supported. Games–Howell post hoc comparisons showed that not all designation groups differed significantly from one another. The difference between Principal Scientists and Senior Scientists was not statistically significant, with Principal Scientists scoring 1.49 points lower than Senior Scientists, *SE* = 0.64, 95% CI [−3.16, 0.18], $p = .083$. Because the confidence interval included zero, this comparison does not provide evidence of a statistically significant difference.

In contrast, Principal Scientists reported significantly lower autonomy orientation than Scientific Officers, with a mean difference of −4.61 points, *SE* = 0.66, 95% CI [−6.30, −2.91], $p < .001$. Similarly, Senior

Scientists reported significantly lower autonomy orientation than Scientific Officers, with a mean difference of −3.11 points, *SE* = 0.27, 95% CI [−3.74, −2.48], $p < .001$.

Table 4

Games–Howell Post Hoc Comparisons of Autonomy Orientation by Marital Status and Job Designations

Comparison	Mean Difference	SE	95% CI	*p*
Marital Status				
Single – Married	4.32	.33	[3.54, 5.10]	< .001
Single – Divorced	5.46	.40	[4.49, 6.42]	< .001
Married – Divorced	1.13	.32	[.36, 1.91]	.003
Job Designation				
Principal Scientist – Senior Scientist	−1.49	.64	[−3.16, .18]	.083
Principal Scientist – Scientific Officer	−4.61	.66	[−6.30, −2.91]	< .001
Senior Scientist – Scientific Officer	−3.11	.27	[−3.74, −2.48]	< .001

The results suggest that the general effect of job designations was largely due to substantially higher autonomy orientation scores of the Scientific Officers than those of the Principal Scientists and Senior Scientists. Overall, the findings suggest that there is substantial marital status and job designation differences in autonomy orientation. The marital status analysis revealed that the differences were statistically significant between all the groups, while the differences between Principal Scientists and Senior Scientists were not statistically significant in the job designation analysis. The results thus suggest that the distribution of autonomy orientation is not even across agricultural researchers and that significant differences in reported autonomy oriented work characteristics are linked to social characteristics and organization position.

SUGGESTIONS FOR FUTURE STUDIES AND PRACTICE

To better understand the relationship between marital status and job designation with autonomy orientation, future studies should include family work conflict, supervisory support, organizational autonomy support, workload, research resources, and involvement in decision making. Further research in the form of longitudinal and/or mixed method studies would help further elucidate whether differences are real differences in workplace autonomy or differences in employees' perceptions and expectations. The practical implication of this is that agricultural research institutions can be more autonomous, by giving researchers more opportunities to be involved in the project selection process, by fostering creative and innovative research, and by giving researchers some flexibility in research activities. Groups with relatively low autonomy orientation could be targeted for special attention to uncover organizational barriers and create more supportive work arrangements.

CONCLUSION

The study finds that there is a significant difference between the autonomy orientation of agricultural researchers in Punjab on the basis of marital status and job designation. The results indicate that there are statistically significant differences between all marital status comparisons, with Scientific Officers being different from the Senior Scientists and Principal Scientists. But this difference was not statistically

significant between Principal Scientists and Senior Scientists. In summary, these results suggest that autonomy oriented work experiences are not evenly distributed across researchers, but are rather diverse. Awareness of these differences can aid agricultural research institutions in creating work environments that offer suitable opportunities for creativity, innovation, interesting work and flexible participation in research projects.

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