

Jacks of All Trades:  
An Investigation of Functional Diversity in Management Teams

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## Introduction to Functional Diversity

There are many kinds of diversity, but a definition holds them together, which is “any attribute that another person may use to detect individual differences” (Williams & O'Reilly, 1998, p. 81). Individual differences in society are often focused on permanent traits such as ethnicity, gender, sexual orientation, and age; in the workplace however, other factors of diversity are decided by an individual's experience, behavior, and organizational infrastructure that, if managed correctly, can exploit the operational benefits that diversity carries.

Diversity, in any dimension, in both society and business, is becoming increasingly relevant. This is partly due to rising globalization, technology that permits remote work, and equal opportunity legislation. Also, diversity is an important consideration in this current era of automation. In response to the growing trend of automation technologies in businesses, c-suite executives state that they expect a 19% lateral shift of employees into different or new roles, anticipating more cross-functionality between teams (Bughin et al, 2018), for which a coherent diversity of team members will be critical to achieving. However, perhaps more authoritative than observable changing workplace climates and CEO speculations is a growing pool of research that suggests competitive and performance advantages for more diverse teams.

Among the various diversities that exist, this paper aims to investigate the nature of functional diversity among management teams. Functional diversity concerns the spectrum of work experience in a team and is what researchers in the field call, “a double-edged sword” (Milliken & Martins, 1996, p. 403) This is due to the fact that though functionally diverse teams have access to a wide range of experience that may help to solve problems, this range of experience also carries with it varied opinions that may hamper team effectiveness and performance. The following review of Bunderson & Sutcliffe's (2002) and Canella, Park & Lee's (2008) research on the subject hopes to illuminate some of the nuances of functional diversity strategies for different types of internal and external operational contexts.

The first type of functional diversity that this paper explores is called Dominant Function Diversity (DFD), which is defined by Bunderson & Sutcliffe (2002, p. 885) as the “the extent to which team members differ in the functional areas within which they have spent the greater part

of their careers.” In simple terms, DFD emphasizes a team’s breadth of knowledge. In an ideal DFD design, a team’s operational functions are characterized by an even distribution of team member expertise in relevant operational area. In their paper, Bunderson & Sutcliffe (2002) cite researched benefits of DFD such as innovation, strategic clarity, and higher long-term performance despite lower short-term performance; and challenges as slower competitive responses, lower consensus, higher conflict, less global strategies, and quicker implementation of the M-form structure.

The second type of functional diversity that this paper examines is called Intrapersonal Functional Diversity (IFD), which is defined by Bunderson & Sutcliffe (2002, p. 880) as “the extent to which the individuals on a team are narrow functional specialists with experience in a limited range of functions, or broad generalists whose work experiences span a range of functional domains.” IFD emphasizes a team member’s breadth of knowledge, and teams with a high level of IFD are comprised of broad generalists. In an ideal IFD design, a team’s operational functions are characterized by an even distribution of team member experience in the all of the relevant operational areas. Before Bunderson & Sutcliffe’s time, IFD had not been studied across team members but had however been loosely studied in individuals. Even after Bunderson & Sutcliffe identified IFD as a distinct trait and defined it, a meta-analysis on the subject of workplace diversity found that subsequent studies did not effectively distinguish IFD from DFD (Bell, Villado, Lukasik, Belau, & Briggs, 2011). This paper will also argue the importance of continuing research on team IFD under different conditions to better understand its full potential in business.

#### Bunderson & Sutcliffe (2002)

Bunderson & Sutcliffe in 2002 researched DFD and IFD levels in business unit (BU) management teams, seeking to investigate the relationship between information sharing and these two types of functional diversities, and the overall effect this relationship had on BU performance. To that end, Bunderson & Sutcliffe started with a literature review of 17 empirical studies that included functional diversity as a key variable, in order to conceptualize how

functional diversity had previously been defined and evaluated. From this review, Bunderson & Sutcliffe noticed a gap in research regarding IFD.

To address this gap, Bunderson & Sutcliffe collected data from BU management teams in a Fortune 100 consumer products company, wherein the BU managers oversaw production, sales, marketing, and supply chain for the company in a specific geographic region. They categorized the BUs into high, medium, and low performance groups and then randomly selected 15 BUs from each group, for an ultimate sample of 45 BU teams. They distributed surveys to the BU managers and their direct reports, which asked individuals to state their years of previous experience among nine areas of operation (sales/marketing; manufacturing; finance/accounting; personnel/HR; distribution/warehouse; research and development; equipment management; administrative support; and general management), and employed this information to calculate the teams' degree of DFD and IFD by using Blau's Heterogeneity Index and their own formula, respectively. The survey also assessed the BUs' level of information sharing, which was measured in the survey on a seven point Likert scale. Unit performance was measured in net operating profit before tax and measured against company annual profitability targets.

In designing their research experiment, Bunderson & Sutcliffe classified DFD and IFD as the independent variables, information sharing as the mediator, and unit performance as the dependent variable, while controlling for: team size; average years of work experience; age and tenure diversity; and market growth. They framed their research using: Social Categorization Theory, which suggests that individuals place themselves and others into social groups (determined by age, gender, ethnicity, social-status, etc.) and then in turn assign positive traits to members of their own group and negative traits to members of other groups; and Expectancy Theory, which suggests that motivation to exert effort towards a certain goal results from an individual's expectation, use, and value of the outcomes and rewards. From these theories and their literature review, Bunderson & Sutcliffe formed the following hypotheses: Hypothesis 1 predicted that the IFD of a BU management team would be positively associated with information sharing within the team; Hypothesis 2 predicted that information sharing within a BU management team would partially mediate the positive relationship between a team's IFD and (short-term) unit performance; Hypothesis 3 predicted that the DFD of a BU management

team would be negatively associated with information sharing within the team; and Hypothesis 4 predicted that information sharing within a BU management team would partially mediate the negative relationship between the team's DFD and (short-term) unit performance.

In testing their hypotheses, Bunderson & Sutcliffe applied three different regression models: in Model 1, the mediator was regressed on the independent and control variables, to observe the influence of the functional diversities on information sharing; in Model 2, the dependent variable was regressed on the independent and control variables to observe the influence of the functional diversities on performance; and in Model 3, the dependent variable was regressed on the independent and control variables as well as the mediator to observe the influence of both information sharing and the functional diversities on performance. The results are reproduced below in Figure 1.

Figure 1: Bunderson & Sutcliffe's Results of Mediated Regression Analysis of Functional Diversity Variables, Information Sharing, and Unit Performance

<b>Results of Mediated Regression Analysis of Functional Diversity Variables, Information Sharing, and Unit Performance<sup>a</sup></b>			
<b>Independent Variables</b>	<b>Model 1: Information Sharing</b>	<b>Model 2: Unit Performance</b>	<b>Model 3: Unit Performance</b>
Controls			
Team size	-.27 <sup>†</sup>	.05	.14
Average years experience	.12	-.22	-.26 <sup>†</sup>
Age diversity	.21	-.08	-.15
Organizational tenure diversity	-.10	-.30 <sup>†</sup>	-.26 <sup>†</sup>
Market growth	-.08	.15	.17
Functional diversity variables			
Dominant function diversity	-.44**	-.44**	-.29 <sup>†</sup>
Intrapersonal functional diversity	.45**	.40*	.25
Mediator			
Information sharing			.34*
<i>F</i>	2.47*	2.36*	2.80*
<i>R</i> <sup>2</sup>	.32	.31	.39
Adjusted <i>R</i> <sup>2</sup>	.19	.18	.25
$\Delta R^2$			.08*
<i>df</i>	7, 36	7, 36	8, 35

<sup>a</sup> *n* = 44. Standardized regression coefficients are reported.

<sup>†</sup> *p* < .10

\* *p* < .05

\*\* *p* < .01

The results in Model 1 support Hypothesis 1, in that the coefficient for IFD indicates a positive relationship with information sharing (*b* = .45, *p* < .01). Moreover, this model also supports Hypothesis 3, in that the coefficient for DFD indicates a negative relationship with information sharing (*b* = -.44, *p* < .01). Comparing the results of the DFD coefficients in Model 2

and Model 3 provides support for Hypothesis 4, in that the variance for the DFD coefficient significantly decreased from  $-.44$  ( $p < .01$ ) to  $-.29$  ( $p < .10$ ) which therefore indicates that information sharing partially mediates the relationship between DFD and performance. On the other hand, comparing the variance of the IFD coefficients in the same two models suggests that Hypothesis 3 should be rejected, in that the IFD coefficient decreased from  $.40$  ( $p < .05$ ) to  $.25$  ( $b = .16, p = \text{n.s.}$ ) which therefore indicates that information sharing may not partially but rather *fully* mediate the relationship between IFD and performance. Despite this somewhat surprising result, it is important to note that this IFD coefficient was six metrics away from approaching significance, which in itself indicates that there may be other attributes of IFD besides information sharing that contribute to a team's performance.

Cannella, Park & Lee (2008)

Cannella, Park & Lee in 2008, like Bunderson & Sutcliffe, studied DFD and IFD among top management teams (TMTs), but did so by investigating the functional diversities' relationships with colocation, environmental uncertainty, and performance. In order to observe this, Cannella, Park & Lee sourced previous research to identify 11 industries facing relative environmental stability (food, furniture, industrial machines, and petroleum) or uncertainty (aerospace, computer, motor vehicles, pharmaceutical, semiconductor, surgical and medical, and telecommunications). From this, they created a shortlist of 207 firms using: Ward's 50,000 Largest Corporations and Compustat between 1990-1996 (for firm information); Dun & Bradstreet's Reference Book of Corporate Management (for TMT demographic information); the Reference Book of Corporate Management, Standard & Poor's Register of Corporations, Directors, and Executives, Lexis-Nexis, Who's Who in Finance and Industry, Who's Who in America, annual reports, and proxy statements filed with the Securities and Exchange Commission (for TMT member background and colocation information); Standard Industrial Classification industry-level data and net firm sales (for environmental uncertainty); and annual return on assets (ROA) (for firm performance). Cannella, Park & Lee defined TMT members as all executives who held rank above vice president or served on the board of directors.

Canella, Lee & Park assigned DFD, IFD, and colocation as the independent variables, environmental uncertainty as the moderator, and unit performance as the dependent variable, while controlling for: firm size; firm age; TMT size; TMT age, gender, tenure, and education; R&D intensity; diversification; number of foreign subsidiaries; and prior firm performance. They framed their research through the Social Categorization Theory and developed the following hypotheses: Hypothesis 1 predicted that TMT IFD would be positively associated with firm performance; Hypothesis 2 predicted that TMT member colocation would be positively associated with firm performance; Hypothesis 3a predicted that TMT member colocation would moderate the effects of TMT IFD on firm performance; Hypothesis 3b predicted that TMT member colocation would moderate the effects of TMT DFD on firm performance; Hypothesis 4a predicted that environmental uncertainty would moderate the performance effects of TMT IFD; Hypothesis 4b predicted that environmental uncertainty would moderate the performance effects of TMT DFD; and Hypothesis 5 predicted that environmental uncertainty would moderate the performance effects of TMT member colocation.

Canella, Park & Lee calculated DFD by measuring TMT previous experience against eight areas of operation (production-operations; R&D and engineering; accounting and finance; management and administration; marketing and sales; law; personnel and labor relations; and other), which was then calculated using an iteration of the Herfindal-Hirschman index. IFD was calculated using a variation of Bunderson & Sutcliffe's formula, which was different in that they uniformly weighted each TMT member's functional area due to unavailable information regarding the time spent in each one. TMT member colocation was also calculated through an adapted Herfindal-Hirschman index formula. Environmental uncertainty was found through first finding the sum of net sales in the 11 industries between 1985 and 1995, and then regressing the five previous years' industry sales against the sixth year for each year and each industry. Unit performance was found through ROA minus net income over assets, and averaged over two years.

Canella, Park & Lee observed the effects of their variables through eight different models: Model 1 acted as a baseline model comprised of all of the control variables; in Model 2, the dependent variable was regressed on the independent and moderator variables; Models 3



through 7 provided the interactions between the independent and moderator variables; and Model 8 acted as an endline model, showing all the main effects and interactions between the variables. The results of these regressions are displayed in Figure 2 below:

Figure 2: Canella, Park & Lee's Results of GLS Regression Analysis for ROA

Independent Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
TMT intrapersonal functional diversity		.13*** (.04)	.11** (.04)	.13*** (.04)	.11** (.04)	.13*** (.04)	.13*** (.04)	.10** (.04)
TMT dominant functional diversity		.01 (.04)	.02 (.04)	.02 (.04)	.02 (.04)	.01 (.04)	.01 (.04)	.02 (.04)
TMT colocation		.09** (.03)	.07* (.03)	.12** (.03)	.10** (.03)	.09** (.03)	.09** (.03)	.10** (.03)
Environmental uncertainty		-.08 <sup>†</sup> (.04)	-.08 <sup>†</sup> (.04)	-.08 <sup>†</sup> (.04)	-.08 <sup>†</sup> (.04)	-.08 <sup>†</sup> (.04)	-.08 <sup>†</sup> (.04)	-.08 <sup>†</sup> (.04)
TMT colocation × intrapersonal functional diversity			.09* (.04)					.10** (.04)
TMT colocation × dominant functional diversity				.06* (.03)				.08** (.03)
Environmental uncertainty × intrapersonal functional diversity					.12*** (.04)			.11** (.04)
Environmental uncertainty × TMT dominant functional diversity						-.01 (.03)		-.02 (.04)
TMT colocation × environmental uncertainty							-.03 (.03)	-.03 (.03)
Firm size	.07 (.06)	.05 (.06)	.03 (.06)	.04 (.06)	.05 (.06)	.05 (.06)	.05 (.06)	.03 (.06)
Firm age	.10* (.05)	.08 <sup>†</sup> (.05)	.08 <sup>†</sup> (.05)	.08 (.05)	.08 <sup>†</sup> (.05)	.08 (.05)	.08 (.05)	.08 <sup>†</sup> (.05)
TMT size	.03 (.04)	.03 (.04)	.04 (.04)	.03 (.04)	.03 (.04)	.03 (.04)	.03 (.04)	.03 (.04)
TMT average tenure	.02 (.04)	.03 (.04)	.03 (.04)	.02 (.04)	.04 (.04)	.03 (.04)	.03 (.04)	.03 (.04)
TMT tenure diversity	.09** (.03)	.08** (.03)	.08* (.03)	.08* (.03)	.08* (.03)	.08** (.03)	.08** (.03)	.07* (.03)
TMT educational diversity	.01 (.04)	.00 (.04)	.01 (.04)	.01 (.04)	.00 (.04)	.00 (.04)	.00 (.04)	.01 (.04)
TMT age diversity	-.04 (.04)	-.06 (.03)	-.06 (.03)	-.05 (.03)	-.05 (.03)	-.06 (.03)	-.06 (.03)	-.05 (.03)
TMT gender diversity	-.00 (.03)	-.01 (.03)	-.02 (.03)	-.02 (.03)	-.01 (.03)	-.01 (.03)	-.01 (.03)	-.02 (.03)
R&D intensity	-.01 (.04)	-.01 (.04)	-.01 (.04)	-.01 (.04)	-.01 (.04)	-.01 (.04)	-.02 (.04)	-.003 (.04)
Diversification	-.01 (.04)	-.02 (.04)	-.02 (.04)	-.01 (.04)	-.01 (.04)	-.02 (.04)	-.02 (.04)	-.01 (.04)
Prior firm performance (instrument)	.09** (.03)	.10** (.03)	.10** (.03)	.09** (.03)	.09** (.03)	.09** (.03)	.09** (.03)	.10** (.03)
Number of foreign subsidiaries	-.00 (.00)	-.00 (.00)	-.00 (.00)	-.00 (.00)	-.00 (.00)	-.00 (.00)	-.00 (.00)	.00 (.00)
Year fixed effects	Included	Included	Included	Included	Included	Included	Included	Included
Constant	-.08 (.07)	-.06 (.07)	-.05 (.07)	-.06 (.07)	-.06 (.07)	-.06 (.07)	-.05 (.07)	-.05 (.07)
$\sigma_{\mu}$	.44	.43	.42	.43	.42	.43	.43	.42
$\sigma_{\epsilon}$	.71	.70	.70	.70	.70	.70	.70	.70
$\rho$	.28	.27	.26	.27	.27	.27	.27	.26
Wald $\chi^2$	78.33***	101.92***	109.80***	106.48***	113.80***	101.77***	102.27***	127.62***

<sup>a</sup> Standardized regression coefficients are reported, with standard errors in parentheses.

<sup>†</sup>  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

The results from Models 2, 3, 4, 5, 6, and 7 support Hypotheses 1 and 2, in that the coefficients for both IFD (e.g. Model 2:  $b = .13$ ,  $p < .001$ ) and colocation variables (e.g. Model 2:  $b = .09$ ,  $p < .01$ ) consistently show a significantly positive relationship with performance. Similarly, Model 3 supports Hypothesis 3a in that the interaction coefficient of TMT colocation and IFD is positive and significant ( $b = .09$ ,  $p < .05$ ). Likewise, Hypothesis 3b is supported by the interaction of TMT colocation and DFD in Model 4 ( $b = .06$ ,  $p < .05$ ), which has a positive

influence on performance. Lastly, Model 5 shows support for Hypothesis 4a, in which the interaction between TMT IFD and environmental uncertainty is positive and significant ( $b = .12$ ,  $p < .001$ ). Among those hypotheses that were not supported was Hypothesis 4b, as demonstrated by the insignificant interaction between TMT DFD and environmental uncertainty in Model 6 ( $b = .01$ ,  $p = \text{n.s.}$ ). As well, Hypothesis 5 did not accrue support from the results in Model 7, which shows an insignificant interaction effect between TMT colocation and environmental uncertainty on performance ( $b = .03$ ,  $p = \text{n.s.}$ ).

### Conclusion

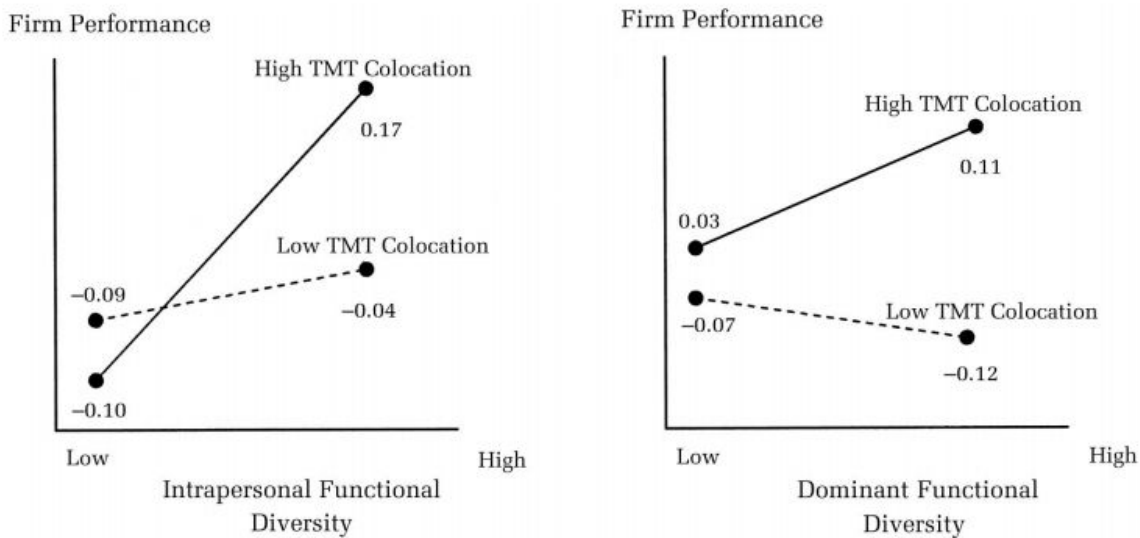
The results from both research teams provide wide support for forming top management teams with high levels of IFD as an advantageous structure that embettens performance. Bunderson & Sutcliffe found that teams composed of members with a high degree of IFD can leverage their common knowledge of various operational functions to better communicate and function, as measured by information sharing and performance indicators. Canella, Park & Lee extended the scope of research to new internal factors besides information sharing, namely geographic dispersion, and external contexts, namely environmental uncertainty, as well as widened the scope from studying one company to 11 industries. Their results show that IFD is able to better resist these challenging contexts better than groups with high DFD, and demonstrated IFD's universal success by studying it across a wide array of industries.

Bunderson & Sutcliffe make a compelling case for both information sharing and IFD as variables that promote improved performance. The former is shown through the inclusion of information sharing among the independent variables, particularly DFD where it was shown that performance suffered when information sharing was omitted; the latter was shown in Model 2 where performance was regressed on IFD alone. However, the power of information and IFD combined were demonstrated in Hypothesis 3, wherein the result indicated that information sharing may fully account for IFD's positive relationship to performance, but its proximity to significance indicates that there may be other factors that explain IFD's positive effect on performance. To determine the influence of information sharing on IFD, this variable could be compared against other internal contexts: friendship could perhaps be a factor of information

sharing, and could be studied through a lens of expectancy theory using socio-emotional indicators against expectancy, instrumentality, and valence criteria. High task complexity has been shown to reduce emotional conflict between team members (Pelled, Eisenhardt, & Xin, 1999) and perhaps is a mediating influence on information sharing or IFD performance as a whole - given IFD's triumph in overcoming onerous internal contexts, it would be interesting to expand the scope of research to teams conducting more rote tasks to see if IFD has any effect in mitigating emotional conflict where it is suggested to occur.

Some insights related to the nature of information sharing in IFD schemes might be drawn from Canella, Park & Lee's results, specifically regarding IFD and DFD team performance in colocated and geographically dispersed teams. Canella, Park & Lee found that colocated teams that both were marked by high levels of IFD and DFD performed significantly better than their geographically dispersed counterparts, and notably that TMTs high in IFD performed better than TMTs high in DFD when geographically dispersed, as shown in Figure 3 below. One idea is that colocation reduces asynchronicity, or the response rate between people, as colocated team members can more easily have face-to-face conversations wherein responses are immediate. Remote teams could experience larger in-group/out-group biases as perpetrated by toxic disinhibition which is marked by uncharacteristic rude language, harsh criticisms, expressions of anger and sometimes threats (Suler, 2004), of which asynchronous communication is suggested to be a factor. Toxic disinhibition is often seen between strangers communicating via the internet and in extrapolating this phenomenon from this context, it could be postulated that similar disinhibition may take place among non-strangers in a dispersed business context but that IFD helps to mitigate this. This too merits further exploration, given the growing interest and occurrence of dispersed teams, likely as a function of the increasing amount and capacity of technologies which allow for remote work.

Figure 3: Canella, Park & Lee's Two-Way Interactions between TMT Colocation and TMT Functional Diversity - Intrapersonal and Dominant



Canella, Park & Lee's Hypothesis 4a findings showed a positive and significant relationship between environmental uncertainty and TMT IFD and their combined effect on performance which, despite having only analyzed uncertainty in a relatively short 10 year period, is nonetheless an encouraging result given the uncontrollable nature of external forces, and inspires speculation as to why this is. Complementary studies that aimed to increase feelings of uncertainty by having subjects read Kafka, about death, or even incoherent work combinations such as "quickly blueberry" (Randles, Proulx & Heine, 2011) resulted in subjects feeling increased fervor in beliefs unrelated to the study such as cultural identity. The supposition here is that people cling to ideas and conceptualizations they are familiar with when they are faced with uncertainty. In abstracting these results, it could be theorized that high IFD could combat these conservative responses towards *related* beliefs (e.g. business strategies) through improved information sharing and other unexplained factors that account for IFD's success in teams.

The teams took different approaches to measuring their different variables and therefore certain considerations must be made when comparing the studies. First, though both teams managed to equalize measures of performance, be it a Fortune 500's internal performance targets or ROA minus net income over assets, Canella, Park & Lee's approach created some limitations for measuring IFD in their attempt to have their formula resemble that of Bunderson & Sutcliffe:

given that Canella, Park & Lee's sources did not provide data on the amount of time top managers spent in each of their domains, they assigned equal weight to each of the TMT member's functional areas, unlike Bunderson & Sutcliffe who calculated the proportion of a BU manager's total years spent in a certain area. This approach does wash out a layer of detail of IFD, in that the range of experience is understood but not the extent, as determined by time spent in the functional area. It is important to note this difference in approach and consider that this solution shifted the way IFD was defined across both experiments, though Canella, Park & Lee's conclusions provide broad support for Bunderson & Sutcliffe's results.

Nonetheless, there is one small difference between the two teams' findings in regards to tenure diversity. Canella, Park & Lee found that tenure diversity had a positive effect on unit performance ( $b = .03, p < .01$ ), while Bunderson and Sutcliffe found the opposite ( $b = -.26, p < .10$ ) even when information sharing was accounted for. Here a reason may be the incongruence of approach between the two research teams: while both followed Allison's (1978) formula in which the standard deviation of tenure among team members is divided by the team mean, Bunderson & Sutcliffe's organizational tenure was self-reported while that of Canella, Park & Lee was collected through a host of industrial databases.

Another thing to consider is the age of the data. While Bunderson & Sutcliffe were pioneer researchers in the field for their identifying and definition of IFD, their research nevertheless took place almost two decades ago. Especially because Bell et al.'s 2011 meta-analysis reports a habitual theoretical equivalence between IFD and DFD, it is prudent to see what studies have made these critical distinctions between different functional diversities and what they have discovered in terms of phenomena and applications.

In summary, Bunderson & Sutcliffe and Canella, Park & Lee were borgeoned the research in IFD and provided important insight on how teams can be best structured to face obstacles in the workplace and in the marketplace. Their findings suggest that emphasizing a shared common interest among managers and executives is crucial for information sharing, strengthening geographically dispersed teams, and quelling the effects of uncertainty. Their research in IFD and the ways it mitigates internal and external constraints should continue as ever complexifying markets demand faster and leaner business solutions.

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