

Including Handedness in Group Diversity Research and Practice

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Investigating ways organizations can utilize employee diversity, this paper introduces the idea that handedness should be included in group diversity research as well as team composition decisions. The experience of being left-handed is explored using cultural, neurological, psychological, and physical perspectives. The issue of handedness within group diversity and team composition is considered with respect to creativity, minority viewpoints, groupthink, task conflict, and resource scarcity. Given the formalized prejudices that face left-handers, it is proposed that these individuals will uniquely contribute to group processes and functioning.

DIVERSITY COMPOSITION OF GROUPS AND TEAMS

The topic of team composition through a diversity perspective has received much attention (Harrison, Price, Gavin, & Florey, 2002; Bell, 2007; Horwitz & Horwitz, 2007; Harrison & Klein, 2007; Joshi & Roh, 2009, Shore et.al., 2009). In search of group performance and creativity, North American workplaces are experiencing more work teams and groups as well as increased diversity (Williams & O'Reilly, 1998; Lau & Murnighan, 1998; Cox Jr., 2001; Mohammed & Angell, 2004). A difficult task, managing work groups effectively is an important aspect of operating a successful organization (Harrison et.al., 2002). Team composition research focuses on how to design and actively manage teams (Bell, 2007). Thought to impact team performance, team composition may change how members of a team communicate, cooperate, and access task-relevant knowledge, skills, or perspectives (Kearney, Gebert, & Voelpel, 2009).

Joshi and Roh (2009) examine the context of team diversity research through a meta-analytic review. In doing so, it is clear that much research has already investigated the demographic effect of gender, age, race, and tenure diversity (Williams & O'Reilly, 1998; Joshi & Roh, 2009). A recent Brazilian study on diversity included race, gender, physical abilities, fitness, ethnicity, and religious orientation (Jabbour, Gordon, de Oliveira, Martinez, & Battistelle, 2011). In an attempt to reconcile the numerous perspectives on group diversity research, Shore et.al., (2009) reviewed the main aspects of group diversity (race, gender, age, disability, sexual orientation, and national origin). Though providing a comprehensive review of demography group diversity research, the authors do not mention handedness at all.

Examining diversity, Ragins and Gonzalez (2003; Cox Jr., 2001) outline the workforce percentages of diverse groups. Groups included in their discussion include white men, people of colour, women, people with disabilities, gay and lesbian people, older people, and people of different religions. Bleijenbergh,

Peters, and Poutsma (2010) discuss diversity characteristics such as the typical sex, ethnicity/race and age, and more broadly, sexual orientation, skills, and experience. This seemingly comprehensive list of diversity variables may lead some researchers to believe that the demographic approach to group diversity has been fully explored. However, one visible minority group has been completely omitted from this research – left-handed individuals. Roberge and van Dick (2009) report previous reviews of diversity research and cannot find consistent main effects of diversity on performance. Not including handedness in diversity research may help explain these findings.

Harrison and Klein's (2007) definition of diversity is "the distribution of differences among the members of a team with respect to a common attribute" (Kearney et.al., 2009, p. 583). Cox Jr. (2001) defines diversity as "the variation of social and cultural identities among people existing together in a defined employment or market situation" (p.469). Roberge and van Dick (2009) define diversity as differences in attributes that may lead individuals to perceive others as dissimilar to themselves. Handedness easily fits into all of these definitions of diversity.

Common lists of 'surface-level' demographic diversity include the characteristics of age, gender, race, and nationality (Mohammed & Angell, 2004; Kearney et.al., 2009). Differences that are visible and have a stigma attached, such as gender or race, could be considered surface-level diversity (Roberge & van Dick, 2009). Considering the negative prejudices and stereotypes attached to left-handedness, it could also be considered a surface-level diversity characteristic. In addition, past studies have looked at functional, educational, and hierarchical diversity of organizational teams, or 'deep-level' diversity. Deep-level diversity is thought to represent differences in member attitudes, beliefs, and values. This type of diversity is considered to be not readily detectable, and learned over time through team interaction (Horwitz & Horwitz, 2007). Experience being left-handed may also result in unobservable differences in attitudes and beliefs, which could be classified as deep-level diversity (Roberge & van Dick, 2009).

Investigating ways organizations can utilize employee diversity and turn it into an asset (Kearney et.al., 2009), this study introduces the idea that handedness should be included in group diversity research as well as team composition decisions.

Though left-handedness is clearly visible to those who observe behaviour, other visible minority groups receive much more attention in research and in the workplace (Coren, 1992). In addition, the psycho-social aspects of being left-handed are usually downplayed. This suggests that left-handed employees should be a recognized visible minority from the group diversity and design perspective. The experience of being left-handed will be explored from cultural, neurological, psychological, and physical perspectives.

It is not the purpose of this study to discuss the potential causes of handedness, but to introduce handedness as a consideration for team composition and design. After all, "If you are left-handed you are discriminated against and at a definite disadvantage" (Trotter, 1974, p. 220). To that end, the issue of handedness within group diversity and team composition is considered with respect to creativity, minority viewpoints, groupthink, task conflict – and as a scarce resource.

THE EXPERIENCE OF LEFT-HANDEDNESS

What makes left-handed employees a unique human resource? This section of the paper intends to demonstrate how the experience of being left-handed has contributed to the individual differences left-handed people possess. This is important as it is thought children hardy enough to persist in left-handedness are not confined to "any one race, nationality, social group, or historical period" (Wilson & Dolan, 1931, p. 262). Taking an inclusive, global perspective, Hardyck and Petrinovich (1977) suggest that approximately 10% of the population are moderately or strongly left-handed. In agreement, Persson and Alleback's (1994) sample of Swedish military conscripts revealed that 8.4% of the roughly 49,000 respondents were left-handed.

As a result of these influences, left-handed individuals may have unique characteristics that could benefit group functioning. Firmly falling into the relation-oriented aspects of diversity (Joshi & Roh, 2009), being left-handed is cognitively accessible, pervasive, and immutable. Immutable differences are

defined as “inborn or representing one’s core identity, such as race, ethnicity, gender, age, physical/abilities qualities, and sexual orientation” (Ragins & Gonzalez, 2003, p.129). Though not mentioning handedness directly, Ragins & Gonzalez (2003) do include individual ‘physical qualities’, which can be interpreted to include handedness. In addition, note that “Preferred hand use is not an easily malleable trait” (Halpern & Coren, 1993, p. 240) as after adolescence the chances of successfully switching hands is very low (Coren, 1992). Left-handed individuals also possess a clear, visible difference from the other group members (who are right-handed).

Trotter (1974) expands on the ‘sinister’ nature of left-handed people by quoting the definition given from Webster’s dictionary: ‘Sinister’ as “on or toward the left hand” and ‘Sinistral’ as a “left-handed person” (p. 220; Halpern & Coren, 1991). “For many years, left-handed people were thought to be ‘odd.’ Children were encouraged to write ... with the right hand” (Hawkey, 1991, p.48). Comparing current student performance with cave drawings, Faurie and Raymond (2004) found consistency in artistic, task-specific, left-handed usage over a 10,000 year span. These are several examples of how left-handed people have historically been influenced in cultural, neurological, psychological, and physical manners.

Cultural

Left-handedness is broadly associated with negative images, symbols, and connotations. Cultural evidence suggests that left-handedness has been “associated with ‘bad’, ‘evil’, or ‘dirty’, in any country or culture” (Mandal & Dutta, 2001, p. 184). Throughout history the left hand was considered less virtuous than the right (Samples, 1980). Right-handed persons were considered more predictable, dependable, hard-working, and conformist. Right-handedness was seen as preserving cultural stability while left-handedness was seen as the sinister deviator from the norm (Samples, 1980). A social stigma is still attributed to left-handed children based on the perceived existence of ‘sinister traits’ (Trotter, 1974). In fact, the majority of artistic representations depict the Devil as left-handed (Coren, 1992). Cultural prejudices are apparent in countries such as Germany, where ‘leftish’ (*linkisch*) means clumsy or awkward, or Denmark, where the left-handed people were linked to Satanism or wizardry (Mandal & Dutta, 2001). Natives in South Africa are said to associate left-handedness with degrading acts (Garrison, 1938).

Though discouraged for most tasks, “Islam strongly enforces use of the left for a few activities, particularly those associated with personal hygiene and dealing with unclean objects” (Payne, 1987, p. 255); this left-handed bias for unclean activities was also found to be the case in India (Mandal & Dutta, 2001). Summarizing 80 Biblical references, Hardyck and Petrinovich (1977) suggest that positive attributes (honour, virtue, power) are connected to right-handedness while negative qualities (suspiciousness, difference) are connected to left-handedness. Coren characterizes the experience of being left-handed as follows “Like many other minority groups it has been subject to prejudice, humiliation, and discrimination – not on the basis of race, religion, age, or national origin, but simply on the basis of the hand that its members use” (Coren, 1992, p. 1).

Creative individuals such as artists and poets have been credited with influencing cultural change while also being linked to “left-handed knowing” (Samples, 1980, p. 17), ambiguity, and deviance. Clearly having great cultural influence, world and national leaders also have a notable number of left-handed individuals; Garrison (1938) cites several Egyptian Pharaohs and Roman Caesars (including Julius) as having been left-handed. Providing essential leadership, a disproportionate number of political luminaries are also left-handed. For example, in the United States five of the last seven Presidents have been left-handed. Summing up the cultural experience of being left-handed, poet Bill Birkle offers this: “I remember the day that I started school; they laughed at me and thought me a fool; I understood the teasing which I couldn’t stand; and all because I wrote with my left hand” (Christman, 2010, p. 652).

Neurological

As a “well-documented predictor of neural differences” (Buser, 2010), this section examines the neurological underpinnings of handedness as part of the experience of being left-handed. Although the exact neural mechanism underlying left-handed control has yet to be identified, several theories have been

proposed (Corballis, 1980). Handedness has been linked to genetic heritability where a specific, and perhaps one single, gene codes for a 'right shift' factor (Annett, 1972). This dominant genotypic representation regulates the gradient of development during the maturation process where development favours one cerebral hemisphere. In right-handed people approximately 70-95% have left hemispheric brain specialization due to the expression of the 'right shift' factor (Ross, 1984). In the remaining 5-30% of the population, development of speech specialization centers is irregular. The cerebral region responsible for handedness is thought to lie opposite to the specialized hemisphere, where right-handers have left-hemispheric language specialization (Samples, 1980). Considering that not all left-handed individuals have right-hemispheric language specialization, Annett (1972) also attributed handedness to 'unsystematic environmental influences'.

Recently it has been suggested that handedness can also stem from environmental influences experienced during the first few years of life (Collins, 1975). Evidenced in baby mice where paw dominance had not yet developed, right-paw dominance emerged when mice were exposed to an environment that was biased to favour right-pawedness. Interestingly, some 10% remained 'sinistral' and favoured left-pawedness. It has also been suggested that hormone levels during fetal development could be responsible for shaping handedness (Ypsilanti et.al., 2008). Variations in the levels of testosterone have been shown to suppress left-cerebral hemisphere development and so specialization favours the right side (Casey & Nuttall, 1990). Whether handedness causality stems from differences in genetics, environmental cues, or pathology, differences in the neurology between right- and left-handers seem to exist (Barnsley & Ravinovitch, 1970). In addition, some researchers believe that the proportion of successful left-handed athletes suggests a neurological advantage (Ziyagil, Gursoy, Dane, & Yuksel, 2010).

Psychological

The experience of being left-handed is a multi-faceted one, with a significant psychological element. With an average occurrence rate of 10% of the population, most psychologists would classify left-handedness as a rare behavioural trait (Coren, 1992). As a visible minority group in all contexts of society, it is doubtful that the negative stereotypes associated with under-represented groups (Joshi & Roh, 2009) can be avoided by left-handed individuals. Left-handed people may experience unique abilities while simultaneously feeling peer derision and ostracism. Though "the average right-hander may be astonished by the assertion that left-handers are stereotyped and deny any feelings of superiority or disdain" (Coren, 1992, p. 8), research suggests that negative stereotypes about left-handed individuals are embedded by puberty. As the dominant majority group, right-handed individuals formalize left-handed prejudices into daily life (Coren, 1992). Unlike individuals possessing less visible stigmatized differences who may choose not to disclose these differences (Shore et.al., 2009), left-handed individuals have no choice but to reveal their difference on a daily basis.

Mandal and Dutta (2001) report on previous studies which suggest the social pressure to conform to right-handedness is less in United States than in Asian countries such as India; however, overall they believe "that the left-handers are subjected to undue social pressure without a fault on their side" (p. 186). Often parents or educators are said to strongly encourage right-handedness by forbidding the child the use of their left hand (Coren, 1992). Holder (1992) reports that left-handers are often pressured socially to write and eat only with the right hand. Williams (1962) acknowledges that many parents and educators seek conformity by attempting to switch left-handed students to using their right hand. Wilson and Dolan (1931) even report the percentages of Oklahoma youth who were forced to switch from left- to right-handed writing due to social pressure (4.62% for males, 2.62% for females). Teng, Lee, Yang, and Chang's (1976) study of 4,143 students from Taiwan revealed that social pressure has reduced the youth to only 0.7% that write and 1.5% that eat left-handed. Pressure to switch hands was reported by 18% of the sample. Citing religious influence, Payne (1987) reports on the social pressures applied to Nigerian students to conform to right-handed usage.

The combined psychological effect of constant admonition and derision cannot be ignored. If a left-handed child can ignore the constant social pressure to change hands, Trotter (1974) posits that the child

“may indeed develop a streak of stubbornness or an inclination to go against group pressure and accepted norms” (p. 221). Additional psychological impact may also result from how left-handed individuals must deal with the physical realm in terms of instrument manipulation and workplace design. Regardless of the source of psychological impact, it is clear left-handed individuals have had to deal with daily issues their right-handed counterparts have not.

Physical

Left-handed people experience difficulty in many tasks due to equipment incompatibility. For example, automobiles, scissors, writing materials, and student desks are almost exclusively designed for use by right-handed people (Coren, 1992). Exerting covert pressure to follow a handedness norm (Halpern & Coren, 1991), facilities and tools of industrialized countries (Mandal & Dutta, 2001) are made to suit right-handed people.

As a result, left-handers are usually more flexible in their hand usage. First, left-handed individuals can choose to learn to use the tools and implements with their right hand. Usually a difficult task, wrong handed tool usage is much more inefficient and dangerous. Second, left-handed individuals can choose to hold the tool with their left hand; backwards or upside-down, this type of usage can also be hazardous and inefficient. Both choices lead to increased adaptability and flexibility for the left-handed person.

Raymond, Pontier, Dufour and Moller (1996) conclude that since the Neolithic era, left-handed people have had a fitness advantage in combat due to a frequency advantage. As a minority, left-handed individuals presented themselves differently than the norm, thus increasing their chances of success. This is based on the “survival of the fittest” theory whereby left-handed individuals are at an advantage in hand-to-hand combat against right-handed opponents. Raymond et.al. found a significantly higher percentage of left-handed athletes in sports like tennis (15%), table tennis (41%), and fencing (50%) than in the general population. In many instances, sports teams make a serious effort to include left-handed individuals on their rosters. In sports such as baseball (Trotter, 1974), basketball, and volleyball, team management seeks left-handed players to fill portions of the team. The left-handed advantage in sport can also be seen in some individual sports such as golf and combat sports (Onion, 2005). Sport scientist Roy Hawkey suggests, “Being left-handed is a definite advantage” for tennis players (p.48). Hawkey concludes that “Left-handers therefore win more games at first, and are more likely to reach club, country, and national standards” (Hawkey, 1991, p.48).

HANDEDNESS IN GROUP DIVERSITY AND TEAM COMPOSITION

The experience of being left-handed has been explored from cultural, neurological, psychological, and physical perspectives. Demonstrating how differences may be present in many aspects of left-handed lives and using the descriptions of surface- and deep-level diversity given by Harrison et.al. (2002), it is not inconceivable that left-handed employees may bridge both forms of diversity. By possessing observable demographic and meaningful psychological differences (Coren, 1992) from their right-handed colleagues, left-handed employees may contribute to team heterogeneity through both surface- and deep-level diversity.

Handedness is one individual difference that spans all other demographic differences. No matter the age, gender, or race of the individual, handedness can be considered. Forming an immutable minority group, left-handed individuals have to battle formalized prejudices that exist in most societies (Coren, 1992). The experience of being left-handed may make these employees valuable members of an organizational team. Harrison and Klein (2007) suggest that from a variety viewpoint, the “odd person out” within a diversity characteristic is the most crucial (p. 1205) to total group information.

Creativity and Innovation

Considering the long-held belief that a positively correlated relationship exists between left-handedness and creativity (Coren, 1992, 1995), team creativity may be affected by handedness diversity. Bryden (1982) found that left-handed individuals are more adept at using right-handed implements than

vice versa, displaying increased adaptability. Alluding to creative ability, Trotter (1974) reports that left-handed artists and musicians sometimes tend to be more creative than right-handed ones. Providing additional evidence, with over 20% of top-scoring students found to be left-handed, Bower (1985) suggests that left-handed youth are twice as likely as their right-handed peers to have talent in math and verbal ability.

Another way to look at creativity is through divergent thinking: “Divergent thinking usually produces ‘original’ or ‘creative’ ideas through the breaking of typical thought sets, the reorganization of materials in uncommon ways, and the consideration of a wide range of alternative solutions to complex problems” (Coren, 1995, p. 321). In his 1995 study, Coren found that left-handed males had higher divergent thinking scores. In fact, a significant positive correlation was found between left-handed tendencies in male participants and divergent thinking scores.

Being a strong right-handed individual has been linked to a variety of deficiencies associated with being cognitively inflexible (Christman, 2011); whereas, individuals who always used their non-dominant hand for at least one task were “associated with an increased ability to adopt multiple and/or novel perspectives and to update pre-existing mental representations” (Christman, 2011, p. 2).

As a result of left-handed tendencies toward creativity and divergent thinking, the benefits may accrue at the group level. Left-handedness provides another diversity characteristic that may lead to increased team innovation and should be a target of group diversity research.

The Minority View

Nemeth (1986) found that the presence of a persistent dissenting minority view aids the group in divergent thinking and examining alternatives to the majority opinion. The minority opinion therefore provides a creative contribution to problem solving and decision making which is beneficial to the group, whether the opinion is correct or not. “Individuals who deviate from norms of silence by voicing concerns may not only rescue an organization from failure but also save human lives” (Warren, 2003, p. 622). In addition, the effect of a questioning minority view may have increased positive benefits if a unanimity decision-making rule is utilized (Ten Velden, Beersma, & De Dreu, 2007).

Warren’s (2003) research on constructive deviance may also apply to left-handed team diversity. Behaviours such as functional disobedience, voicing, whistle-blowing, and dissent are considered constructive. Given the divergent thinking of left-handed individuals, perhaps the presence of these individuals would help ensure these behaviours occur and the minority view is voiced. The presence of minority experiences is assured in groups that possess left-handed individuals. That is, the more left-handed employees per group, the more exposure of persistently expressed minority opinions could be expected.

Groupthink

In pursuit of group cohesion, members can let the goal of unanimity override the evaluation of other solutions. In these cases, groupthink is a distinct outcome of group functioning. Groupthink exists when any dissent is suppressed with the intention of reaching consensus (Janis, 1971). In groupthink, the group applies pressure to any member who deviates from the group position (Haslam et.al., 2006), resulting in “individuals losing their capacity for independent thought and surrendering to the folly of the collective” (p. 608).

A selection of the cognitive errors and observable signs of groupthink are given below (Janis, 1971; Okhuysen & Eisenhardt, 2004; Haslam et.al., 2006). These include the following factors: Immediate pressure to conform on group members who dissent; Calculated, personal avoidance of consensus deviation or self-censorship; Rationalization that allows warnings and negative feedback to be ignored; Shared illusions of unanimity of opinion. Included as antecedents to groupthink are high group cohesion and autocratic leadership, as well as having an insulated and homogeneous group (Janis, 1971). Having a homogeneous group is one important precursor to groupthink (Horwitz & Horwitz, 2007), and a group of all right-handed employees should be considered homogeneous in terms of handedness.

Relating to groupthink, there is reason to believe that group diversity leads to higher decision quality (Horwitz & Horwitz, 2007). Recommended remedies for groupthink include “the use of external advisors, creating intra-group division, and actively countering group norms” (Haslam et al., 2006, p. 608). As Samples suggests that the role of the deviant left-handed individual is to “invent, create, and challenge conformity” (1980, p.19), the pressures of conformity involved in groupthink may be mitigated by left-handed employees.

Task Conflict

Okhuysen and Eisenhardt (2004) suggest that creating collective intuition, pushing the process speed, and stimulating task conflict are tactics to achieve greater group processes. Handedness may have a relationship with stimulating task conflict. One contributor to task conflict is the inability to express disagreement (Okhuysen & Eisenhardt, 2004). Observed through the Abilene Paradox of Groupthink, group members who do not express disagreement may miss a chance to challenge assumptions and in doing so do not propose better solutions or elements of the problem. Groupthink also can involve overt pressure to conform to the team’s wishes. “As research demonstrates, conflict stimulates innovative thinking, and creates better understanding of the options” (Okhuysen & Eisenhardt, 2004, p. 216). One way to increase task conflict is through team composition diversity, previously studied with age, gender, functional background, and experience (Okhuysen & Eisenhardt, 2004).

Jehn (1995) discovered that for groups undertaking non-routine tasks, task conflict was not detrimental and may have been beneficial. Member conflict may increase with group diversity; however, some diversity is needed to ensure the quality of decision-making (Horwitz & Horwitz, 2007). Great group processes are described as quick, conflictual, and mutually respectful (Okhuysen & Eisenhardt, 2004).

Another way to increase task conflict is to designate one member a role which is meant to question the assumptions of the group (Okhuysen & Eisenhardt (2004). Given the ‘sinister’, ‘evil’, and ‘curse-riddled’ cultural history of left-handed individuals (Coren, 1992), they would seem a natural for the ‘Devil’s Advocate’ role. Left-handed participants tend to be more hesitant than right-handed participants when performing a new task (CTV.ca News Staff, 2008). In a sense, by tending to go against group pressure (Trotter, 1974) left-handed employees may indirectly serve as a device to create team conflict. In combination with the relative ‘invisibility’ of left-handedness, it is possible that it is beneficial task conflict that is created.

Resource Scarcity

Mainly developed from the resource-based view, Becker and Gerhart (1996) suggest that human resource strategies are an important source of sustained competitive advantage. The resource-based view “emphasizes how firms are able to combine rare and unique collections of resources within a single firm to create synergies and achieve competitive advantage over competing firms” (Dyer & Singh, 1998, p. 296). Legge (2005) uses the resource-based view of the firm and strategic human resources management (SHRM) literature to argue that employees can be seen as resources and the source of a possible competitive advantage for an organization. If utilized properly, human resources can play a large role in achieving organizational goals. The very existence of SHRM illustrates how organizations try to proactively manage resource relationships, in this case human capital, to their optimal long-term advantage (Legge, 2005).

Left-handed people often have difficulty operating tools and machinery designed for the right-handed employee. Many left-handed casualties have been attributed to left-handed employees either learning to use the tool with their ‘wrong’ hand or using the tool improperly with their left hand (Holder, 1992). Due to the danger and clumsiness of tools and facilities designed for right-handed safety, left-handed people are thought to be at risk of reduced longevity (Halpern & Coren, 1993). Left-handed people were found to have an increased chance of mortality (1-2% higher than right-handed people) after the age of 33 (Halpern & Coren, 1991). This alludes to left-handedness as a scarce and perhaps precious resource. In

the physical realm, left-handed individuals have added value to sporting organizations, as they are a rare, sought-after resource.

Using the strategic resource-based view of human resources, handedness yields yet another category which may be considered when allocating resources. Though perhaps not a traditional resource, left-handed employees are a tangible asset which may be used strategically toward a specific goal (Barney, 2001) within the bounds of strategic human resource management. Jabbour et.al. (2011) suggest that organizations should structure their processes to optimize competitive advantages of diverse groups of employees. The scarcity of left-handed individuals suggests that organizations may possess in left-handed employees an untapped resource, which could positively contribute to group functioning and increased performance.

DISCUSSION

Research suggests that diverse team outcomes may be negative if member differences are easily categorized (Horwitz & Horwitz, 2007). Though some negative effects of team diversity have been reported (Harrison et.al., 2002; Joshi & Roh, 2009; Kearney et.al., 2009) and include increased stereotyping, dysfunctional conflict, and turnover (Williams & O'Reilly, 1998), it is believed that handedness may provide the team heterogeneity required to gain the benefits of diversity while remaining 'invisible' enough to not be included in social categorization and stereotyping processes. This may be true in a sense, as many right-handed people do not realize left-handed people exist in their personal environments (Coren, 1992).

Rather than weigh the pros and cons of diversity, Ragins and Gonzalez (2003) suggest organizations determine how to manage and capitalize on workforce diversity. Whatever the type of diversity, the active management of diversity is an essential skill for present day managers (Cox Jr., 2001). Jabbour et.al. (2011) suggest that economic, individual, and social benefits may result if managers can optimize diversity. Consequently, inclusion of left-handedness into research and practice may also hold additional benefits for researchers and organizations. Given that "No one really knows why, but the ratio that seems to govern handedness in humans has remained remarkably consistent, across cultures, ethnicities and time" (Ross, 2011), handedness diversity research may hold long-term global benefits.

Theoretical Implications

Foremost, this paper extends group diversity research to include handedness, whether termed 'surface-level', observable, or bio-demographic diversity. In the most recent review of diversity research Shore et.al. (2009) outline the six main areas of diversity research, while never mentioning handedness. A meta-analytic review of group diversity research revealed no mention of handedness; only age, gender, and race/ethnicity were considered (Horwitz & Horwitz, 2007). In their landmark paper of group faultiness, Lau and Murnighan (1998) limit their discussion to demographic factors that could affect the group development process. Though handedness is a visible and immutable individual difference, and Coren (1992) clearly describes how discrimination toward handedness can negatively affect employee functioning, Lau and Murnighan omit handedness and limit their discussion to age, sex, race, tenure, and status. The existence of left-handed team members may put into question past findings on group diversity. The handedness variable was present and apparently uncontrolled in *all* previous group diversity research.

Though purely exploratory at this point, research into handedness may help explain the varied findings of team demographic diversity on team performance (Horwitz & Horwitz, 2007; Joshi & Roh, 2009). Joshi and Roh (2009) found that white male dominated occupations had a higher incidence of negative performance effects with gender and ethnic team diversity. Handedness may provide the needed heterogeneity while mitigating the negative effects found in other variables, such as race and gender (Williams & O'Reilly, 1998). Within the team composition literature, this research may contribute to how innovative teams are formed. To help ensure that a minority viewpoint is heard and that groupthink does not occur, organizations should consider handedness as a decision criterion.

Practical Implications

Williams and O'Reilly (1998) suggest that management of diversity is important in order to realize its potential positive effects. This suggests management of handedness diversity may also be important as another diverse group in team composition decisions. Organizations and managers could design groups to include left-handed employees and even attempt to separate and strategically utilize left-handed employees (if possible, given the scarcity of the resource). The benefits of functionally diverse teams (Ancona & Caldwell, 2004) can still be had; but when two candidates with equivalent functional background have a handedness difference, the organization may be better served to select the left-handed employee for certain groups.

Bell (2007) suggests that team composition is easiest to address during selection and placement activities. This places handedness diversity as a possible criterion in employee selection. The extreme abilities of left-handers fall on both ends of the spectrum, with left-handed individuals generally either exceptionally bright or exceptionally dull (Coren, 1992). Even if selection procedures are not altered to attract or recruit left-handed employees, the left-handed employees that do make it through a comprehensive selection process will be likely to fall in the exceptionally gifted group. Bleijenbergh, Peters, and Poutsma (2010) advise managers to be proactive when dealing with diversity considerations and left-handedness provides this opportunity.

Limitations of Handedness Diversity Research

Several methodological issues may be present during the future study of handedness in group diversity. Bleijenbergh et.al. (2010) suggest many diversity researchers do not sufficiently consider the context studied. Roberge and van Dick (2009) suggest context should be taken into account when determining whether a diversity characteristic is considered surface or deep level. With stereotypes and myths about left-handed people spanning the globe and enduring to the present day, the context for in which handedness is salient should be most contexts. Left-handed people have consistently remained approximately 10% of the population: ever-present and constantly challenged.

The presence of other diversity variables may provide confounding factors, and though these variables may be controlled, they may nevertheless provide alternative explanations to team performance. In addition, the number of left-handed individuals is low and as a result, finding enough groups with one or more left-handed employees is a challenge. It is certain that many workgroups will not have left-handed members from which to collect information. As a result, the significance of future studies may be an issue.

Future Research

To verify several of the relationships suggested in this paper and to better understand handedness in group diversity, further research must be conducted. Recalling the idea that left-handed individuals may be more naturally creative (Coren, 1995), this paper suggests that left-handers may have an advantage in the realm of innovation. Future research should attempt to understand whether left-handed members are more likely to present creative, divergent ideas or whether groups with left-handed members are more likely to innovate.

In addition, addressing the minority opinion, the inclusion of divergent opinions helps battle groupthink and provides a better solution. Therefore it would be useful to investigate, in groups with left-handed individuals, the likelihood that the minority opinion is voiced and whether groupthink is encountered.

The occurrence of task conflict in groups with left-handed individuals is also of interest. It is thought that these groups may incur more beneficial task conflict. Moreover, the role of the left-handed individuals in groups and their effect on group processes, functioning, and performance is a fruitful avenue for further research.

Another interesting direction for the study of handedness in organizations is the investigation into left-handed 'clusters'. Evidence of left-handed clusters may be seen among mathematicians, architects, artists, chess masters (Coren, 1995), and first basemen in baseball (Raymond et.al., 1996). First, it would

be of interest to see if these clusters exist in organizations, and second, examine what type of roles these clusters have grown around. Specific contexts or cultures (Kearney et.al., 2009), team types, and industry sectors may require individual examination (Joshi & Roh, 2009).

CONCLUSION

Addressing the call to examine ways in which diversity could aid in the success of the organization (Shore et.al., 2009), this paper also submits another meaningful demographic characteristic to the group diversity literature. Though not accounted for in any past research on group diversity and team composition, handedness is an important individual difference that should also be included, wherever diversity research is headed.

First, no matter the cause of left-handedness, and as it remains a mystery, the continued existence of this visible minority group in all contexts of society calls for further handedness group diversity research. With 33 million left-handed North Americans (Coren, 1992) this minority group should not continue to be ignored. Left-handed diversity may be especially valuable as it may be a difference which is distributed across all demographic team composition variables. Inclusion of handedness in future group diversity research is the first goal of this paper. Several recent reviews of demographic group diversity research (Shore et.al., 2009, Joshi & Roh, 2009) fail to even mention handedness as a consideration. As a result, it is recommended here that all studies *at least* consider handedness in diversity research.

Second, managers and organizations involved in team composition and design decisions should consider handedness as a legitimate strategic criterion. If organizational decision-makers ignore handedness, the group may display more homogeneous tendencies even if other demographic differences are accounted. Serving as the basis of categorization and stereotyping, handedness may not be a salient characteristic to all members of the team, yet proven differences in handedness provide the diversity required for divergent and dissenting opinions to be heard.

Third, achievement of awareness surrounding the handedness in the group diversity perspective is sought. Increased social awareness may reduce pressure to switch hands culturally and help debunk embedded stereotypes. Awareness of the unique abilities of left-handed individuals may help them be embraced and valued for the different perspective they bring. This may be seen through efforts to accommodate with facilities and equipment in educational and organizational contexts. Researchers and organizations may come to the realization that left-handed individuals are a valuable resource, providing unique experiences not available from other types of diversity. As a result, rather than remain invisible, handedness could become a valued strategic organizational resource, just as it serves as an advantage in some sports like wrestling (Ziyagil et.al., 2010), baseball, and fencing (Raymond et.al., 1996).

Relationships discussed in this paper address whether handedness diversity may influence teams through creativity and innovation, beneficial task conflict, divergent opinions, and minority viewpoints. Though left-handedness may not be the typical conception of team composition diversity, perhaps with increased attention and inclusion, left-handed employees can gain a fresh start, without the structural disadvantages.

Perhaps the only visible minority to be virtually ignored by policy and the business literature, this paper is calling in the southpaw for future inclusion in group diversity research and organizational considerations.

REFERENCES

Ancona, D. & Caldwell, D. (2004). Compose Teams to Assure Successful Boundary Activity. In E. A. Locke (Ed.), *Handbook of Principles of Organizational Behavior*. (pp. 199-210). Oxford, UK: Blackwell Publishing.

Annett, M. (1972). The distribution of manual asymmetry. *British Journal of Psychology*, 63, 343-358.

- Barney, J. (2001). Is the resource-based view a useful perspective for strategic management research? Yes. *Academy of Management Review*, 26, 41-56.
- Barnsley, R.H. & S.M. Ravinovitch. (1970). Handedness: Proficiency versus stated preference. *Perceptual and Motor Skills*, 30, 343-362.
- Becker, B., & Gerhart, B. (1996). The impact of human resource management on organizational performance: Progress and prospects. *Academy of Management Journal*, 39(4), 779-802.
- Bell, S. (2007). Deep-level composition variables as predictors of team performance: A meta-analysis. *Journal of Applied Psychology*, 92, 595-615.
- Bleijenbergh, I., Peters, P. & Poutsma, E. (2010). Diversity management beyond the business case. *Equality, Diversity and Inclusion: An International Journal*, 29(5), 413-421.
- Bower, B. (1985). The Left Hand of Math and Verbal Talent. *Science News*, 127(17), 263.
- Bryden, M.P. (1982). *Laterality: functional asymmetry in the intact brain*. NY: Academic Press.
- Buser, T. (2010). *Handedness Predicts Social Preferences: Evidence Connecting the Lab to the Field*. Tinbergen Institute Discussion Paper. November, 1-24.
- Casey M.B. & R.L. Nuttall. (1990). Differences in feminine and masculine characteristics in women as a function of handedness: support for the Geschwind/Galaburda theory of brain organization. *Neuropsychologia*, 28(7), 749-754.
- Collins, R.L. (1975). When left-handed mice live in right-handed worlds. *Science*, 187, 181-184.
- Corballis, M. (1980). Is left-handedness genetically determined? *Neurophysiology of Left-Handedness*, Academic Press, Inc. 159-176.
- Coren, S. (1992). *The left-hander syndrome*. NY: The Free Press.
- Coren, S. (1995). Differences in Divergent Thinking as a Function of Handedness and Sex. *The American Journal of Psychology*, 108(3), 311-325.
- Cox Jr., T. (2001). Creating the Multicultural Organization: The challenge of managing diversity. In J. M. Shafritz, J. S. Ott and Y. S. Jang (Eds.), *Classics of Organization Theory*, 6th Ed. (pp. 469-475). Belmont: Thomson Wadsworth.
- Christman, S. (2010). The Poetry of Handedness. *Laterality*, 15(6), 651-658.
- Christman, S. (2011). Handedness and 'open-earedness': Strong right-handers are less likely to prefer less popular musical genres. *Psychology of Music*, July, 1-8.
- CTV.ca News Staff (2008, November 4). *Southpaws more inhibited and anxious, study says*. Retrieved July 3, 2009, from http://www.ctv.ca/servlet/ArticleNews/story/CTVNews/20081104/left-handed_study_081104/20081104?hub=Health.
- Dyer, J. H., & Singh, H. (1998). The Relational View: Cooperative Strategy and Sources of Interorganizational Competitive Advantage. *Academy of Management Review*, 23(4), 660-679.

- Faurie, C. & Raymond, M. (2004). Handedness Frequency over More than Ten Thousand Years. *Biological Sciences*, 271(Supplement 3), S43-S45.
- Garrison, K. (1938). Problems Related to Left-Handedness. *Peabody Journal of Education*, 15(6), 325-332.
- Halpern, D. & Coren, S. (1991). Left-Handedness: A Marker for Decreased Survival Fitness. *Psychological Bulletin*, 109(1), 90-106.
- Halpern, D. & Coren, S. (1993). Left-Handedness and Life Span: A Reply to Harris. *Psychological Bulletin*, 114(2), 235-241.
- Hardyck, C. & Petrinovich, L. (1977). Left-Handedness. *Psychological Bulletin*, 84(3), 385-404.
- Harrison, D., Price, K., Gavin, J. & Florey, A. (2002). Time, Teams, and Task Performance: Changing effects of surface- and deep-level diversity on group functioning. *Academy of Management Journal*, 45, 1029-1045.
- Harrison, D. & Klein, K. (2007). What's the Difference? Diversity constructs as separation, variety, or disparity in organizations. *Academy of Management Review*, 32, 1199-1228.
- Haslam, S. A., Ryan, M. K., Postmes, T., Spears, R., Jetten, J., & Webley, P. (2006). Sticking to our guns: social identity as a basis for the maintenance of commitment to faltering organizational projects. *Journal of Organizational Behavior*, 27(5), 607-628.
- Hawkey, Roy. (1991). *Sport Science*, 2nd Ed. London, UK: Hodder and Stoughton.
- Holder, M.K. (1992). *Hand preference questionnaires: One gets what one asks for*. M.Phil. thesis, Department of Anthropology, Rutgers University, New Brunswick, NJ, USA.
- Horwitz, S. & Horwitz, I. (2007). The Effects of Team Diversity on Team Outcomes: A meta-analytic review of team demography. *Journal of Management*, 33, 967-1015.
- Jabbour, C., Gordono, F., de Oliveira, J., Martinez, J. & Battistelle, R. (2011). Challenges, benefits, and the role of human resource management in Brazilian organizations. *Equality Diversity and Inclusion: An International Journal*, 30(1), 58-74.
- Janis, I. (1971). Groupthink: The Desperate Drive for Consensus at Any Cost. In J. M. Shafritz, J. S. Ott and Y. S. Jang (Eds.), *Classics of Organization Theory*, 6th Ed. (pp. 185-192). Belmont: Thomson Wadsworth.
- Jehn, K. A. (1995). A Multimethod Examination of the Benefits and Detriments of Intragroup Conflict. *Administrative Science Quarterly*, 40(2), 256-282.
- Joshi, A. & Roh, H. (2009). The Role of Context in Work Team Diversity Research: A meta-analytic review. *Academy of Management Journal*, 52(3), 599-627.
- Kearney, E., Gebert, D. & Voelpel, S. (2009). When and How Diversity Benefits Teams: The importance of team members' need for cognition. *Academy of Management Journal*, 52(3), 581-598.

- Lau, D., & Murnighan, K. (1998). Demographic diversity and faultlines: The compositional dynamics of organizational groups. *Academy of Management Review*, 23(2), 325-340.
- Legge, K. (2005). *Human Resource Management: Rhetorics and Realities*, Anniversary ed. Basingstoke: Macmillan.
- Mandal, M. & Dutta, T. (2001). Left handedness: Facts and Figures across Cultures. *Psychology Developing Societies*, 13, 173-191.
- Mohammed, S., & Angell, L. C. (2004). Surface- and deep-level diversity in workgroups: examining the moderating effects of team orientation and team process on relationship conflict. *Journal of Organizational Behavior*, 25(8), 1015-1039.
- Nemeth, C. J. (1986). Differential contributions of majority and minority influence. *Psychological Review*, 93(1), 23-32.
- Okhuysen, G. & Eisenhardt, K. (2004). Excel Through Group Processes. In E. A. Locke (Ed.), *Handbook of Principles of Organizational Behavior*. (pp. 211-225). Oxford, UK: Blackwell Publishing.
- Onion, A. (2005, February 17). *The Left-Handed Advantage: They May Have Higher Health Risks, But Lefties Enjoy Element of Surprise*. Retrieved July 3, 2009, from <http://abcnews.go.com/Technology/story?id=498707andpage=1>.
- Payne, M. (1987). Impact of cultural pressures on self-reports of actual and approved hand use. *Neuropsychologia*, 25(1B), 247-258.
- Persson, P. & Allebeck, P. (1994). Do Left-Handers Have Increased Mortality? *Epidemiology*, 5(3), 337-340.
- Ragins, B. R., & Gonzalez, J. A. (2003). Understanding Diversity in Organizations: Getting a Grip on a Slippery Construct. In J. Greenberg (Ed.), *Organizational Behaviour and the State of the Science* (2nd ed., pp. 125). Mahwah, NJ: Lawrence Erlbaum.
- Raymond, M., Pontier, D., Dufour, A. & Moller, A. (1996). Frequency-Dependent Maintenance of Left Handedness in Humans. *Biological Sciences*, 263(1377), 1627-1633.
- Roberge, M. -É., & van Dick, R. (2009). Recognizing the benefits of diversity: When and how does diversity increase group performance? *Human Resource Management Review*, doi:10.1016/j.hrmr.2009.09.002.
- Ross, E.D. (1984). Right hemisphere's role in language, affective behavior and emotion. *Trends in Neuroscience*, 7, 3342-3346.
- Ross, O. (2011). Lefties a minority, hands down. But why? *The Toronto Star*. Published Friday May 27th. Retrieved June 10th, 2011 from <http://www.thestar.com/news/insight/article/997646--lefties-a-minority-hands-down-but-why>.
- Samples, B. (1980). *The Metaphoric Mind*. United States of America: Addison-Wesley Publishing Company
- Shore, L.M., Chung-Herrera, B.G., Dean, M.A., Ehrhart, K., Jung, D., Randel, A., &

- Singh, G. (2009). Diversity in Organizations: Where are we now and where are we going? *Human Resource Management Review*, 19, 117-133.
- Ten Velden, F., Beersma, B. & De Dreu, C. (2007). Majority and Minority Influence in Group Negotiation: The Moderating Effects of Social Motivation and Decision Rules. *Journal of Applied Psychology*, 92(1), 259-268.
- Teng, E. L., Lee, P., Yang, K., & Chang, P. C. (1976). Handedness in a Chinese population: Biological, social, and pathological factors. *Science*, 795, 1148-1150.
- Trotter, R. (1974). Sinister Psychology: Tests and studies indicate that left-handedness need not and should not be considered an undesirable trait. *Science News*, 106(14), 220-222.
- Warren, D. E. (2003). Constructive and Destructive Deviance in Organizations. *Academy of Management Review*, 28(4), 622-632.
- Williams, W.N. (1962). Teaching the Left-Handed Child. *Peabody Journal of Education*, 40(2), 77-78.
- Williams, K., & O'Reilly, C. A. (1998). Demography and diversity in organizations: A review of 40 years of research. In B. M. Staw and L. L. Cummings (Eds.), *Research in organizational behavior* (pp. 77-140).
- Wilson, M. & Dolan, L. (1931). Handedness and Ability. *The American Journal of Psychology*, 43(2), 261-268.
- Yipsilanti, A., Ganou, M., Koidou, I., & G. Grouios. (2008). Digit ratio (2D:4D) in individuals with intellectual disability: investigating the role of testosterone in the establishment of cerebral lateralisation. *Laterality*. 13(6), 527-544.
- Ziyagil, M., Gursoy, R., Dane, S. & Yuksel, R. (2010). Left-handed Wrestlers are more Successful. *Perceptual and Motor Skills*, 111(1), 65-70.

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