

# **Human Capital, Overlapping Tenure, and Behaviors: A Study of Unit Performance**

**Christopher M. Harris**  
Texas Woman's University

**Gary C. McMahan**  
University of Texas-Arlington

*This study contributes to human capital research by examining human capital and the stability of human capital along with processes through which they influence performance. Specifically, this study theoretically develops and empirically tests relationships among human capital, overlapping tenure, behaviors, and performance with a unique sample of NCAA football teams. This sample allows for the examination of the relationships that human capital and overlapping tenure have with different measures of processes and performance. Human capital and overlapping tenure at the unit level are found to be related to different measures of unit processes and unit performance. Additionally, a variety of processes at both the unit level are related to greater performance at the unit and team levels. Finally, evidence of processes mediating the relationships between human capital and performance and between overlapping tenure and performance is found.*

## **INTRODUCTION**

An organization's human capital has been recognized as an important element in the success of organizations (e.g., Becker, 1964; Crook, Todd, Combs, Woehner, & Ketchen, 2011; Ployhart, Weekley, & Ramsey, 2009; Takeuchi, Lepak, Wang, & Takeuchi, 2007; Wright, McMahan, & McWilliams, 1994; Wright, Smart, & McMahan, 1995). In this study we specifically examine relationships among unit human capital, unit relationship stability, unit processes, and unit performance. Human capital is defined as unit level knowledge, skills, and abilities used to produce a given set of outcomes (Hitt, Bierman, Shimizu, & Kochhar, 2001). Additionally, we assess relationship stability as the unit level amount of time individuals have worked together (overlapping tenure). This coincides with Leana and Van Buren (1999) who theorized that the stability of relationships among individuals is an element in the success of units. We follow resource-based and human capital theories along with relationship stability research to theoretically develop and empirically test relationships among human capital, overlapping tenure, processes, and performance.

According to the resource-based view of the firm, internal resources that are valuable, rare, inimitable, and non-substitutable can create a competitive advantage (Barney, 1991). Human capital is an internal resource that can create a competitive advantage for organizations (Wright, McMahan, & McWilliams, 1994). This study makes important contributions to human capital research. First, we

extend human capital research by examining processes through which human capital influences unit performance. Second, we examine the different human capital needed for different units within the same organization and the relationships this human capital has with the different processes that are needed for each unit to succeed. Additionally, we make a contribution by examining unit overlapping tenure and unit processes through which unit overlapping tenure influences unit performance.

Previous human capital research has tended to examine human capital and performance of an entire organization (e.g., Carmeli & Schaubroeck, 2005; Harris, McMahan, & Wright, in press; Lopez-Cabrales, Valle, & Herreo, 2006; Takeuchi, Lepak, Wang, & Takeuchi, 2007) without recognizing different units within organizations and the differences in human capital and performance in these units (see Liao, Toya, Lepak, & Hong, 2009 for an exception). We make a distinction between two separate units within organizations which allows us to examine the relationships that human capital and overlapping tenure have with the different processes and performance indicators of the different units.

We also contribute to human capital research by examining processes through which human capital and overlapping tenure influence the performance of units. Previous human capital research has tended to focus on the direct relationship of human capital with performance (e.g., Carmeli & Schaubroeck, 2005; Lopez-Cabrales, Valle, & Herreo, 2006; Ployhart et al., 2009; Takeuchi, Lepak, Wang, & Takeuchi, 2007). While Wright et al. (1994) proposed that through their behaviors and processes, people use their human capital to produce performance and models (e.g., Delery & Shaw, 2001; Wright & McMahan, 1992) have proposed that processes mediate the relationship between human capital and performance, this relationship has received little empirical attention.

In this study we employ a sample of NCAA football teams. This sample allows us to examine relationships among human capital, overlapping tenure, processes, and performance of offensive units, defensive units. Therefore, we are able to recognize the different types of human capital and behaviors that are needed in each unit to produce performance (Wright et al., 1994). For example, the human capital needed to play on offense is different from the human capital needed to play on defense. Additionally, the processes that are exhibited on offense to produce performance are different from the processes that are exhibited on defense to produce performance. We are also able to recognize the different performance measures that are used to evaluate offensive units and defensive units. The recognition of different performance measures highlights the need for people with the human capital and potential to exhibit the necessary processes for the specific unit they are working in to be successful (Wright et al., 1994).

## **THEORETICAL BACKGROUND AND HYPOTHESES**

### **Unit Human Capital and Unit Performance**

Human capital has been recognized as an important element in the success of organizations (e.g., Combs et al., 2011; Harris et al., in press; Hitt et al., 2001; Ployhart et al., 2009; Wright, Smart, & McMahan, 1995). According to human capital theory, differences in the stock of human capital within units can create performance differences across units (Becker, 1965). Additionally, human capital and resource-based view theories predict that it is the unit aggregate of individual knowledge, skills, and abilities, that lead to unit performance (Ployhart et al., 2009). Therefore, units with higher levels of human capital should perform at higher levels.

Human capital has been operationalized in a variety of ways and has been studied in a variety of contexts. Hitt et al. (2001) examined human capital in law firms and operationalized it as quality of law school attended and firm-specific tenure. Ployhart and colleagues (2006) operationalized human capital as personality traits and in another study operationalized human capital as unit service orientation (2009). In a strategic human resource management context, human capital has tended to be operationalized in a more general or generic fashion (e.g., Carmeli & Schaubroeck, 2005; Lopez-Cabrales, Valle, & Herrero, 2006; Takeuchi, Lepak, Wang, & Takeuchi, 2007). While these studies have operationalized human capital in a variety of fashions and studied it in a variety of contexts, a positive relationship between human capital and performance has tended to be found.

In this study we examine the human capital of football players on offensive units and defensive units. We obtain a human capital measure for each player from Rivals, an industry accepted scouting agency that rates high school and junior college football players on their ability and potential to play football at a Football Bowl Subdivision (formerly named Division One) college or university. By examining human capital of offensive and defensive units we are able to recognize differences in the human capital needed for each unit to perform at a high level. Additionally, the performance outcomes of offensive and defense units are different. For example, the goal of offensive units is to score as many points as possible, while the goal of defensive units is to allow as few points as possible. These different performance outcomes require offensive and defensive units to have different types of human capital. Based on the evidence presented above, we expect higher levels of human capital to be associated with higher performance.

*Hypothesis 1a: Greater offensive unit human capital will be related to the offensive unit scoring more points*

*Hypothesis 1b: Greater defensive unit human capital will be related to the defensive unit allowing fewer points.*

### **Unit Overlapping Tenure and Unit Performance**

Overlapping tenure is defined as the amount of time people have worked together towards common performance outcomes. It has been theorized that when organizations encourage stable job tenure and reinforce associability and trust, they may perform better than organizations that only focus on individual contributions (Leana & Van Buren, 1999). Our focus on the stability of relationships among football players most closely fits with the structural aspect of interpersonal relationships (Nahapiet & Ghoshal, 1998). It has been noted that the structural aspect of interpersonal relationships can be analyzed from the perspective of the stability of the relationships among people (Inkepn & Tsang, 2005). Therefore, turnover among members of a unit may lead to instability in the relationships among the people in the unit which may create performance deficiencies (Inkepn & Tsang, 2005; Reagans et al., 2005). Additionally, with the structural aspect, face-to-face interaction has been emphasized because it is argued to be a necessary condition for knowledge sharing (Hansen, 1999). Football players on the same unit have many face-to-face interactions which allow them to share knowledge with each other and learn more about each others' capabilities in order to work together in a more synchronized fashion, which may create greater performance.

The shared experiences of individuals allow them to coordinate their activities better, share knowledge, learn, and therefore perform at higher levels (Berman et al., 2002). In a study of NBA teams, Berman et al. (2002) stated group knowledge is acquired through shared experience. Berman et al. (2002) found that as NBA players played together longer their teams tended to win more games. Therefore, it is important for units to have individuals work together for a sustained period of time (Luo, 2001). Additionally, in a previous study of overlapping tenure, Harris et al. (2012) found the overlapping tenure of basketball teams was related to higher team performance.

In this study we specifically examine the overlapping tenure of players on offensive units, and the overlapping tenure of players on defensive units. When offensive unit players develop overlapping tenure they may be able to coordinate their activities better which should allow them to perform at a higher level. The same effect should occur with defensive unit players. As defensive players develop overlapping tenure, the defensive unit should perform at a higher level.

*Hypothesis 2a: Greater offensive unit overlapping tenure will be related to the offensive unit scoring more points*

*Hypothesis 2b: Greater defensive unit overlapping tenure will be related to the defensive unit allowing fewer points*

### **Unit Human Capital and Unit Processes**

While it is important for units to have human resources with high levels of human capital, it also important for these human resources to exhibit the necessary processes for the unit to be successful (Delery & Shaw, 2001; Wright et al., 1994; Wright & Snell, 1991). Therefore, units must select individuals that have the human capital necessary to exhibit the required processes (Wright et al., 1994). According to Wright et al. (1994), the potential of human capital is realized only to the extent that the possessors of the human capital choose to allow the unit to benefit from the human capital through their behaviors.

As stated previously, based on the function being performed, different processes are needed. Therefore, units need people with different types of human capital that have the capability to exhibit the necessary processes. Offensive and defensive units of football teams perform different processes, therefore offensive and defensive units will need different types of human capital with the potential to perform the necessary processes. Offensive units will need players with human capital that allow the unit to gain yards rushing and passing and allow few quarterback sacks. Defensive units will need players with human capital that enable the unit to allow as few yards rushing and passing as possible and also to accumulate as many quarterback sacks and tackles for loss as possible. Therefore, we predict:

*Hypothesis 3a: Greater offensive unit human capital will be associated with greater amounts of rushing and passing yards gained and a lesser amount of quarterback sacks allowed.*

*Hypothesis 3b: Greater defensive unit human capital will be associated with fewer rushing and passing yards allowed and a greater amount of quarterback sacks and tackles for loss accumulated.*

### **Unit Overlapping Tenure and Unit Processes**

Models of human resource management (e.g., Delery & Shaw, 2001; Wright & McMahan, 1992; Wright & Snell, 1991) indicate that characteristics of the human resource capital pool influence the processes exhibited by people. Overlapping tenure is a characteristic of the human resource capital pool that may facilitate the processes exhibited. Over time, as individuals work together, they are able to develop routines which allow them to gain knowledge about each other and the tasks they are performing. These organizational routines are defined as “recognizable patterns of interdependent actions, involving multiple actors” (Feldman & Pentland, 2003:96). Organizational routines involve many interpersonal interactions (Feldman & Rafaeli, 2002) and through these interpersonal interactions, individuals may be able to develop better relationships. Ultimately, the stability of relationships among and between individuals may allow individuals who work together to draw upon prevailing knowledge and refine their evolving body of knowledge to behave in ways that benefit the organization (Subramaniam & Youndt, 2005).

On football teams when players on offensive and defensive units are able to work together for a sustained period of time they are able to gain an understanding of the capabilities of their teammates and how their teammates will react in certain situations. When teammates are more familiar with each other, they may be able to better coordinate their activities, which would allow them to execute the behaviors necessary to be successful. When offensive unit players are familiar with each other, it may allow them to gain more yards rushing and passing and allow fewer quarterback sacks. Additionally, when defensive unit players are more familiar with one another, they may be able to allow fewer yards rushing and passing and accumulate more quarterback sacks and tackles for loss. Therefore, we predict:

*Hypothesis 4a: A greater amount of offensive unit overlapping tenure will be associated with greater amounts of rushing and passing yards gained and a lesser amount of quarterback sacks allowed.*

*Hypothesis 4b: A greater amount of defensive unit overlapping tenure will be associated with fewer rushing and passing yards allowed and a greater amount of quarterback sacks and tackles for loss accumulated.*

## **Unit Processes and Unit Performance**

According to Wright et al. (1994), human resources must exhibit the necessary processes for performance to be achieved. Additionally, models of human resource management (e.g., Delery & Shaw, 2001; Wright & McMahan, 1992; Wright & Snell, 1991) indicate a relationship between the processes and unit performance. Previous research has found that when people exhibit necessary processes, greater performance can be achieved. For example, teams that display coordination processes have been found to perform at a high level (Stewart, 2006; Stewart & Barrick, 2000).

The processes needed to create performance depend greatly on the performance outcomes that organizations or units want to achieve. Therefore, different processes are needed to achieve different dimensions of performance. This is true in business organizations and NCAA football teams. For example, in a business organization the processes needed to create performance in an HR department are different from the processes necessary to achieve performance in a production department. Similarly, with football teams, offensive units and defensive units need to exhibit different processes in order for the offensive units and defensive units respectively to achieve performance.

*Hypothesis 5a: Offensive units that gain greater amounts of yards rushing, yards passing, and allow fewer quarterback sacks will score more points.*

*Hypothesis 5b: Defensive units that allow fewer yards rushing, yards passing, and accumulate more quarterback sacks and tackles for loss will allow fewer points.*

## **Behaviors as Mediators**

The systems perspective of human resource management proposes that characteristics of the workforce act as inputs that are transformed through processes exhibited by the workforce to result in performance outcomes (Delery & Shaw, 2001; McMahan et al., 1999; Wright & McMahan, 1992; Wright & Snell, 1991). Therefore, processes should mediate the relationship between characteristics of the human resource capital pool and performance.

As mentioned previously, different types of human capital are necessary to exhibit different processes and different processes are needed to produce different types of performance. Therefore, through their behaviors, people use their human capital to produce performance. With NCAA football teams, offensive unit players will use their human capital to exhibit the offensive processes needed for the offensive unit to be successful. Similarly, defensive unit players will use their human capital to exhibit the defensive processes needed for performance.

*Hypothesis 6a: Offensive unit processes (rushing and passing yards gained and quarterback sacks allowed) will mediate the relationship between offensive unit human capital and offensive unit performance.*

*Hypothesis 6b: Defensive unit processes (rushing and passing yards allowed and quarterback sacks and tackles for loss accumulated) will mediate the relationship between defensive unit human capital and defensive unit performance.*

When football players have stable relationships with their teammates they are able to identify and coordinate the various capabilities of players in a synchronized fashion to produce greater team performance. The familiarity that players gain with each other over time allows them to better execute the behaviors needed to produce performance (Hitt et al., 2002; Kacmar et al., 2006). Therefore, through their processes, players will use their overlapping tenure to produce performance. Overlapping tenure developed among offensive unit players, allows offensive unit players to become more familiar with each other, which may allow them to coordinate their activities to exhibit the processes necessary for the offensive unit to be successful. We can expect this similar phenomenon to occur on defensive units as players develop overlapping tenure with one another.

*Hypothesis 7a: Offensive unit processes (rushing and passing yards gained and quarterback sacks allowed) will mediate the relationship between offensive unit overlapping tenure and offensive unit performance.*

*Hypothesis 7b: Defensive unit processes (rushing and passing yards allowed and quarterback sacks and tackles for loss accumulated) will mediate the relationship between defensive unit overlapping tenure and defensive unit performance.*

## **METHODS**

### **Sample**

National Collegiate Athletic Association (NCAA) Football Bowl Subdivision (formerly Division One) football teams were used as the sample for this study. By choosing a sample of organizations from the same industry, it allows for many controls to be built into the study. For example, the NCAA sets rules on the number of scholarships each team has, it also sets recruiting regulations, and the NCAA sets limits on the amount of time each team can practice.

All data for this study were archival. Of the 120 NCAA Football Bowl Subdivision football teams that competed in the 2008 season, complete data were able to be obtained for 119 teams.

## **MESURES**

### *Unit Human Capital*

We obtained a measure of football players' human capital from Rivals NCAA men's football recruiting database. Rivals provides an industry accepted, third party measure of football players' human capital. Rivals is an industry leader in college sports recruiting and its content is syndicated to major media outlets such as Yahoo, Sports Illustrated, USA Today, and Sirius Satellite Radio (Rivals, 2008). Rivals provides recruiting ratings of football players, the college or university each player signed a letter of intent with, and the year each player signed the letter of intent. Rivals employs a team of recruiting analysts with both regional and national expertise that are located throughout the country. The player ratings are compiled based on film evaluation, personal observations, and input from professional, college, and high school coaches (Rivals, 2008). Rivals rates players from zero to five with five being the highest rating a player could receive. Ratings are based on the level of ability Rivals believes a player has in playing football.

Rosters for each team were obtained from an online database maintained by the NCAA (<http://web1.ncaa.org/mfb/mainpage.jsp>). Based on each team's roster for the 2008 season, the Rivals rating for each player listed on the roster was collected. Players on rosters that were not included in the Rivals ratings were given a zero rating. Then we identified whether each player played on offense or defense. Offensive players included quarterbacks, running backs, wide receivers, tight ends, offensive linemen, and kickers. The human capital ratings for each player at these offensive positions were averaged together to arrive at an offensive unit human capital measure for each team. Defensive players included defensive linemen, linebackers, cornerbacks, safeties, and punters. The human capital ratings for each player at these defensive positions were averaged together to arrive at a defensive unit human capital measure for each team.

### *Unit Overlapping Tenure*

As mentioned above we obtained rosters for each team and determined whether each player was on the offensive unit or the defensive unit. Then, based on the rosters, the number of seasons each player had been with each team was determined.

One simple way of computing tenure would be to attribute years tenure based on year in school (freshman, sophomore, junior and senior being attributed 1, 2, 3, and 4 years, respectively). Redshirts (when a student athlete does not participate in the sport for an entire academic year) and transfers make this an inaccurate measure of overlapping tenure. In some cases players had been redshirted. When a

student-athlete redshirts he or she may practice with the team, but cannot compete against outside competition. Thus, the student-athlete would not use a year of eligibility. For those players in this situation a season was added on to the amount of time a player had been with a team. For example, a junior who redshirted a season would be considered as being with the team for four seasons as opposed to three seasons for a junior who did not redshirt.

Junior college transfers were also an issue. When junior college players transfer to Football Bowl Subdivision colleges or universities they may join the football team at the Football Bowl Subdivision college or university level already having used two seasons of eligibility based on NCAA rules. For example, a junior college player may be listed as a junior on a roster, but it may be the player's first season with the team. In this situation, the player was considered to be with the current team for one year.

We calculated the overlapping tenure of players on the offensive unit by comparing the tenure of each player on the offensive unit to every other player on the offensive unit. After determining each offensive player's overlapping tenure with every other offensive player on the offensive unit, an average of individual players' overlapping tenure was calculated to arrive at an average of players overlapping tenure for each team's offensive unit. This same procedure was followed using defensive unit players to calculate the overlapping tenure of the defensive unit.

### *Unit Processes*

Offensive and defensive units on football teams exhibit a number of different processes. We based offensive and defensive processes on statistics that are collected and maintained by the NCAA. We obtained these statistics from the same database that gave us the rosters for each team. The offensive unit processes we assessed were the average number of rushing yards gained per game, the average number of passing yards gained per game, and the average number of quarterback sacks allowed per game. The defensive unit processes we assessed were the average number of rushing yards allowed per game, the average number of passing yards allowed per game, the average number of quarterback sacks per game, and the average number of tackles for loss per game.

### *Offensive and Defensive Unit Performance*

Offensive and defensive unit performance were based on statistics maintained by the NCAA. For the offensive units we assessed performance as the average number of points scored per game. As the goal of the offensive unit is to score as many points as possible, the average number of points scored per game represents performance for offensive units. For the defensive units we assessed performance as the average number of points allowed per game. The goal of defensive units is to prevent the opposing team from scoring; therefore the average number of points allowed represents performance of defensive units.

## **RESULTS**

Table 1 displays the means, standard deviations, and correlations of the variables of interest in this study. The results for hypothesis 1 are presented in Table 2. Hypothesis 1a was not supported as offensive unit human capital was not significantly related to offensive points scored. In support of hypothesis 2b, defensive unit human capital was significantly related to defensive point allowed ( $\beta = -.33$ ,  $p < .01$ ). Therefore, defensive units with higher levels of human capital allow fewer points.

The results of hypothesis two are displayed in Table 3. Hypothesis 2a was not supported as offensive unit overlapping tenure was not significantly related to offensive points scores. Hypothesis 2b was supported as defensive unit overlapping tenure was significantly related to defensive points allowed ( $\beta = -.20$ ,  $p < .05$ ). This result indicates that defensive units that play together longer allow fewer points.

**TABLE 1**  
**MEANS, STANDARD DEVIATIONS, AND CORRELATIONS**

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Offensive Unit HC	1.55	.51												
2. Defensive Unit HC	1.67	.56	.88**											
3. Offensive Unit Overlapping Tenure	1.79	.21	-.02	.01										
4. Defensive Unit Overlapping Tenure	1.84	.23	.23*	.20*	.55**									
5. Rushing Yards	154.3	49.48	-.14	-.03	.23*	.14								
6. Passing Yards	215.7	61.08	.14	.12	-.12	-.18	-.29**							
7. Sacks Allowed	1.91	.66	.06	.06	-.19*	-.22*	-.51**	.01						
8. Rushing Yards Allowed	147.7	38.5	-.29**	-.35**	-.17	-.10	-.42**	.08	.24**					
9. Passing Yards Allowed	212.3	34.51	-.22*	-.21*	.20*	-.20*	.11	.31**	-.01	.19*				
10. Sacks	1.96	.60	.23*	.25**	.08	.02	.22*	.11	-.13	-.62**	-.09			
11. Tackles for Loss	5.84	1.12	.14	.18	-.10	-.07	.18	.07	-.08	-.57**	-.16	.75**		
12. Offensive Points Scored	26.99	7.61	.16	.23*	.10	-.02	.46**	.61**	-.37**	-.38**	.28**	.37**	.29**	
13. Defensive Points Allowed	25.84	6.94	-.28**	-.33**	-.27**	-.20*	-.30**	.19*	.32**	.79**	.52**	-.47**	-.47**	-.21*

n = 119 \* p < .05, \*\* p < .01; HC = Human Capital



**TABLE 2**  
**UNIT HUMAN CAPITAL PREDICTING UNIT PERFORMANCE AND UNIT PROCESSES**

Independent Variables	D.V. Offensive Points Scored	D.V. Rushing Yards	D.V. Passing Yards	D.V. Sacks Allowed	D.V. Defensive Points Allowed	D.V. Rushing Yards Allowed	D.V. Passing Yards Allowed	D.V. Sacks	D.V. Tackles for Loss
Offensive Unit Human Capital	.16	-.14	.14	.06					
Defensive Unit Human Capital					-.33**	-.35**	-.21*	.25**	.18
R <sup>2</sup>	.03	.02	.02	.00	.11	.12	.04	.06	.03

n = 119 \* p < .05, \*\* p < .01

**TABLE 3**  
**UNIT OVERLAPPING TENURE PREDICTING UNIT PERFORMANCE AND UNIT PROCESSES**

Independent Variables	D.V. Offensive Points Scored	D.V. Rushing Yards	D.V. Passing Yards	D.V. Sacks Allowed	D.V. Defensive Points Allowed	D.V. Rushing Yards Allowed	D.V. Passing Yards Allowed	D.V. Sacks	D.V. Tackles for Loss
Offensive Unit Overlapping Tenure	.10	.23*	-.12	-.19*					
Defensive Unit Overlapping Tenure					-.20*	-.17	-.20*	.02	-.07
R <sup>2</sup>	.01	.05	.02	.04	.04	.03	.04	.00	.00

n = 119 \* p < .05, \*\* p < .01

The results of hypothesis 3 are presented in Table 2. Hypothesis 3a was not supported as offensive unit human capital was not significantly related to rushing yards gained, passing yards gained, or quarterback sacks allowed. Hypothesis 3b was mostly supported as defensive unit human capital was significantly related to rushing yards allowed ( $\beta = -.35, p < .01$ ), passing yards allowed ( $\beta = -.21, p < .05$ ), and quarterback sacks accumulated ( $\beta = -.25, p < .01$ ). These results indicate that defensive units with higher levels of human capital exhibit desired processes, such as allowing fewer yards rushing and passing, and accumulating more quarterback sacks.

The results of hypothesis 4 are displayed in Table 3. Hypothesis 4a received support as offensive unit overlapping tenure was significantly related to rushing yards gained ( $\beta = .23, p < .05$ ) and quarterback sacks allowed ( $\beta = -.19, p < .05$ ). These results indicated that offensive units that are together for longer periods of time, gain more yards rushing and allow fewer quarterback sacks. Hypothesis 4b received some support, as defensive unit overlapping tenure was significantly related to passing yards allowed ( $\beta = -.20, p < .05$ ).

The results of hypothesis 5 are displayed in Table 4. To test hypothesis 5a we entered the offensive unit processes (rushing yards gained, passing yards gained, and quarterback sacks allowed) simultaneously into the regression predicting offensive unit performance. Together these three variables predicted 82% of the variance in offensive unit performance. The number of rushing yards gained ( $\beta = .68, p < .01$ ) and the number of passing yards ( $\beta = .81, p < .01$ ) were significantly related to offensive unit performance. However, the number of quarterback sacks was not significantly related to offensive unit performance. These results indicate that the more rushing and passing yards offensive units gain, the more points they score. To test hypothesis 5b we entered the defensive unit processes (rushing yards allowed, passing yards allowed, quarterback sacks accumulated, and tackles for loss accumulated) simultaneously into the regression predicting defensive unit performance. Together these variables predicted 76% of the variance in defensive unit performance. The number of rushing yards allowed ( $\beta = .73, p < .01$ ) and the number of passing yards allowed ( $\beta = .38, p < .01$ ) were significantly related to defensive performance. These results indicate that when defensive units allow lower amounts of passing and rushing yards, they give up fewer points to opposing teams' offensive units.

**TABLE 4**  
**UNIT PROCESSES PREDICTING UNIT PERFORMANCE**

Independent Variables	D.V. Offensive Points Scored	D.V. Defensive Points Allowed
Rushing Yards	.68**	
Passing Yards	.81**	
Sacks Allowed	-.03	
Rushing Yards Allowed		.73**
Passing Yards Allowed		.38**
Sacks		.02
Tackles for Loss		-.01
R <sup>2</sup>	.82**	.76**

n = 119, \* p < .05, \*\* p < .01

Hypotheses 6 and 7 predicted unit processes would mediate the human capital – performance and overlapping tenure – performance relationships. To test for mediation, Baron and Kenny (1986) stated four conditions need to be satisfied. First, the independent variable should be related to the dependent variable. Second, the independent variable should be related to the mediator. Third, the mediator should be related to the dependent variable. Finally, the fourth condition stipulates that when the effect of the mediator is accounted for, the direct relationship between the independent and dependent variables should become non-significant (full mediation) or substantially smaller (partial mediation).

Offensive unit human capital was not significantly related to offensive unit performance; therefore hypothesis 6a is not supported. For the defensive unit the conditions needed to test for mediation were met when rushing yards allowed and passing yards allowed were used as mediating variables. Table 5 displays the results of the mediation tests. As stated previously, defensive unit human capital was significantly related to defensive unit performance ( $\beta = -.33, p < .01$ ). When rushing yards allowed was entered into the regression simultaneously with defensive unit human capital, the beta weight for defensive unit human capital was reduced and became non-significant ( $\beta = -.06, p > .05$ ). Therefore, rushing yards allowed fully mediated the relationship between defensive unit human capital and defensive unit performance. When defensive unit human capital and passing yards allowed were entered into the regression equation simultaneously, the beta weight for defensive unit human capital was reduced, but remained significant ( $\beta = -.23, p < .01$ ). This indicates that passing yards allowed partially mediated the relationship between defensive unit human capital and defensive unit performance. A Sobel test was conducted using Preacher and Hayes's (2004) procedure for simple mediation for each of the mediations. The results provided support for rushing yards allowed acting as a mediator ( $Z_{\text{Sobel}} = -2.82, p < .01$ ) between defensive unit human capital and defensive unit performance. These results provide support for hypothesis 6b.

**TABLE 5**  
**DEFENSIVE UNIT PROCESSES MEDIATING THE RELATIONSHIP BETWEEN**  
**DEFENSIVE UNIT HUMAN CAPITAL AND PERFORMANCE**

Independent Variables	D.V. Defensive Points Allowed	D.V. Defensive Points Allowed
Defensive Unit Human Capital	-.06	-.23**
Rushing Yards Allowed	.77**	
Passing Yards Allowed		.47**
R <sup>2</sup>	.62	.32

n = 119, \* p < .05, \*\* p < .01

Hypothesis 7a was not supported as offensive unit overlapping tenure was not significantly related to offensive unit performance. For hypothesis 7b, the conditions to test for mediation were met when passing yards allowed was used as the mediator variable. As stated previously, defensive unit overlapping tenure was significantly related to defensive unit performance ( $\beta = -.20, p < .05$ ). The mediation results are displayed in Table 7. When defensive unit overlapping tenure and passing yards allowed were entered simultaneously into the regression equation predicting defensive unit performance, the beta weight for defensive unit overlapping tenure was reduced and became non-significant ( $\beta = -.11, p > .05$ ). This indicates that passing yards allowed fully mediated the relationship between defensive unit overlapping tenure and defensive unit performance. This result provides some support for hypothesis 7b.

**TABLE 6:**  
**DEFENSIVE UNIT PROCESSES MEDIATING THE RELATIONSHIP BETWEEN**  
**DEFENSIVE UNIT HUMAN CAPITAL AND PERFORMANCE**

Independent Variables	D.V. Defensive Points Allowed
Defensive Unit Overlapping Tenure	-.11
Passing Yards Allowed	.50**
R <sup>2</sup>	.28

n = 119, \* p < .05, \*\* p < .01

## DISCUSSION

This study contributes to and extends prior human capital research first by examining the influences human capital and overlapping tenure have on the different processes and performance outcomes of different units within the same organization. As mentioned previously, human capital research has tended to focus on the human capital and performance of entire organizations e.g., Carmeli & Schaubroeck, 2005; Harris et al., 2012; Lopez-Cabrales et al., 2006; Takeuchi et al., 2007) without recognizing the different human capital that would be needed to execute the different processes needed for the performance of different units within organizations. Additionally, we extend human capital research by examining processes through which human capital and overlapping tenure influence performance. Previous research has tended to focus on the direct effect of human capital on performance (e.g., Barrick, Stewart, Neubert, & Mount, 1998; Crook et al., 2011; Humphrey, Morgeson, & Mannor, 2009; Ployhart

et al., 2009). Therefore, we extend this line of research by examining unit processes as mediators to the unit human capital – unit performance and unit overlapping tenure – unit performance relationships.

The results of this study arguably support the resource-based view and human capital theory that imply higher levels of human capital will lead to greater performance outcomes. It is interesting to note that while defensive unit human capital significantly predicted higher defensive unit performance, offensive unit human capital was not significantly related to offensive unit performance. Additionally, we found defensive unit overlapping tenure significantly predicted higher defensive performance. Similar to the human capital results, offensive unit overlapping tenure did not significantly predict offensive unit performance. These results are interesting as they may indicate the greater importance of human capital and overlapping tenure to the performance of defensive units than offensive units. One explanation may be that defense is more strategically important to football teams than offense. Therefore, greater levels of human capital and overlapping tenure are needed for defensive units to be successful. This finding is important to business organizations because it indicates that certain units may require greater levels of human capital and overlapping tenure in order to be successful. Therefore, organizations may pay greater attentions to units that are potentially more strategically important than other units.

We also examined the relationships between unit human capital and unit processes. Our findings support the notion that different units require the execution of different processes and therefore, different human capital is needed in different units (Wright et al., 1994). We found defensive unit human capital significantly predicted the defensive processes of allowing fewer rushing yards and passing yards. Additionally, defensive unit human capital was related to a greater amount of quarterback sacks accumulated. On the offensive unit, human capital did not significantly predict any of the offensive processes. Similar to the results of unit human capital predicting unit performance, the defensive unit human capital seems to be more important than the offensive unit human capital. These results provide further evidence of the importance of human capital to defensive units; which once again implies the strategic importance of defensive units.

Examining overlapping tenure, we found that the overlapping tenure of offensive units was related to offensive unit processes. Additionally, we found the overlapping tenure of defensive units to be related to defensive unit processes. These findings indicate that when people have the opportunity to work together for a sustained period of time they exhibit processes necessary for units within organizations to perform at a high level. An interesting finding is that while offensive unit human capital was not significantly related to any offensive units processes, the overlapping tenure of offensive units was significantly related to passing yards gained. This finding indicates that it is important for offensive units to have stable tenure in order to exhibit behaviors necessary for the offense to be successful. Overall, the overlapping tenure results indicate the importance of people in the same unit having stable tenure in order to execute the necessary processes. With football teams it is important for teammates to become familiar with one another. When teammates on offensive and defensive units respectively, become familiar with one another, they are able to learn about their teammates' capabilities and how they will react in different situations. This knowledge of their teammates that develops over time will allow offensive and defensive units to synchronize their actions to exhibit the processes necessary for the units to be successful. This is also applicable to people working in business organizations, the more familiar people are with the people they work with the more likely they will be able to coordinate their activities and exhibit processes necessary for the organization to perform at a high level.

We also found offensive unit processes and defensive unit processes were significantly related to offensive unit performance and defensive unit performance respectively. These findings indicate that when people work in units that have different performance outcomes, the processes necessary for the unit to be successful are different. For example, with football teams for the offensive unit to be successful, they unit must gain yards rushing and passing. Additionally, for the defensive unit to be successful it must limit the amount of rushing and passing yards it allows. These findings are important to organizations that have a variety of units that perform different functions and have different performance measures. It thus becomes important for organizations to recognize the different processes that need to be executed in different units in order for the units to perform at high levels. Once business units recognize

the processes that need to be executed in order to create higher levels of performance, they can focus on acquiring and developing the human capital needed to execute the behaviors necessary for unit performance.

This study extended human capital research by examining processes through which human capital and overlapping tenure influences performance. We found unit processes mediated the defensive unit human capital – unit performance relationship and the defensive unit overlapping tenure – unit performance relationships. As mentioned previously, most human capital research has focused on the direct effect of human capital on performance. Our findings contribute to and extend research in this area by indicating that through unit processes, unit human capital and unit overlapping tenure influence unit performance. These results also demonstrate that the human capital needed for defensive units is transformed through the different processes exhibited at the defensive unit level to result in performance at the defensive unit level. Our results regarding overlapping tenure indicate that through unit processes, unit overlapping tenure is transformed into higher levels of unit performance. These results also stress the importance to organizations of selecting and retaining people with the human capital and motivation to execute the processes needed for organizational success.

## **LIMITATIONS**

A limitation of the study could be the generalizability of the sample. While we did employ a sample of sports teams in this study, NCAA football teams may closely represent larger business organizations. NCAA football teams consist of offensive and defensive units that require different types of human capital and processes to be successful. Additionally, each unit has its own performance outcomes. This is similar to business organizations in which there are a variety of jobs, departments, and business units. The different jobs, departments, and business units in an organization may require different types of human capital and processes and they may have different metrics on which their performance is measured. For example, a research and development department and a production facility of an organization most likely require different types of human capital and processes in order to be successful. While these functions within an organization may be distinct, they each contribute to the overall performance of the organization, just as offensive and defensive units contribute to the performance of NCAA football teams.

We also recognize a limitation with our measures of unit processes. While these measures may be proxies for the different processes of offensive and defensive units, they are still industry accepted measures. Additionally, the unit processes of NCAA football teams are different from the processes that are needed to for a business organization to be successful. The results of our study do however, point to the importance of unit processes as a mediator to the human capital – performance and overlapping tenure-performance relationships. Future research can seek to extend our findings to more traditional organizations. Lastly, we examined one NCAA Football season making our study cross-sectional. Longitudinal studies will be needed to see if our results are consistent or change over time.

## **CONCLUSION**

This study contributed to human capital research, first, by recognizing different units within the same organization and the different human capital, processes, and performance requirements of the different units. Additionally, this study extended human capital research by examining processes through which human capital and overlapping tenure influence performance. Our results indicated that indeed, different units employ different types of human capital to execute different unit processes to produce unit performance. Also, through unit processes, unit human capital and unit overlapping tenure influence unit performance. Our findings also indicate that human capital and overlapping tenure are more important to some units than other units. This may indicate the strategic importance of certain units and indicate which units require greater attentions from organizations as their human capital and overlapping tenure needs are greater. Therefore, a greater focus on the specific human capital needed for specific units to

execute their required processes to produce higher levels of performance is needed by organizations to develop a competitive advantage.

## REFERENCES

- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1): 99-120.
- Becker, G.S. (1965). *Human Capital*. Chicago: University of Chicago Press.
- Berman, S.L., Down, J., & Hill, C.W.L. (2002). Tacit knowledge as a source of competitive advantage in the National Basketball Association. *Academy of Management Journal*, 48(1): 13-31.
- Carmeli, A & Schaubroeck, J. (2005). How leveraging human resource capital with its competitive distinctiveness enhances the performance of commercial and public organizations. *Human Resource Management*, 44(4): 391-412.
- Crook, T.R., Todd, S.Y., Combs, J.G., Woehrer, D.J., & Ketchen, D.J. (2011). Does human capital matter? A meta-analysis of the relationship between human capital and firm performance. *Journal of Applied Psychology*, 96(3), 443-456.
- Delery, J. E., & Shaw, J. (2001). The Strategic Management of People in Work Organizations: Review, Synthesis, and Extension. In G. Ferris and J. Martocchio (eds) *Research in Personnel and Human Resource Management*, Vol. 20, pp 165-197.
- Feldman, M.S. & Pentland, B.T. (2003). Reconceptualizing organizational routines as a source of flexibility and change. *Administrative Science Quarterly*, 48: 94-119.
- Feldman, M.S. & Rafaeli, A. (2002). Organizational routines as sources of connections and understandings. *Journal of Management Studies*, 39(3): 309-331.
- Hansen, M.T. (1999). The search transfer problem: The role of weak ties in sharing knowledge across organization subunits. *Administrative Science Quarterly*, 44(1): 82-111.
- Harris, C.M., McMahan, G.C., & Wright, P.M. (2012). Talent and time together: The impact of human capital and overlapping tenure on unit performance. *Personnel Review*, 41(4): 408-427.
- Hitt, M.A., Bierman, L., Shimizu, & Kochhar, R. (2001). Direct and indirect effects of human capital on strategy and performance in professional service firms: A resource-based perspective. *Academy of Management Journal*, 44 (1): 13-28.
- Hitt, M.A., Lee, H., & Yucel, E. (2002). The importance of social capital to the management of multinational enterprises: Relational networks among Asian and western firms. *Asia Pacific Journal of Management*, 19: 353-372.
- Inkpen, A.C. & Tsang, E.W.K. (2005). Social capital, networks, and knowledge exchange. *Academy of Management Review*, 30(1): 146-165.
- Kacmar, K.M., Andrews, M.C., Van Rooy, D., Steilberg, R.C., & Cerrone, S. (2006). Sure everyone can be replaced...But at what cost? Turnover as a predictor of unit-level performance. *Academy of Management Journal*, 49(1): 133-144.
- Leana, C., & Van Buren, H. (1999). Organizational social capital and employment practices. *Academy of Management Review*, 24: 538-555.
- Lopez, Cabrales, A., Valle, R. & Herreo, I. (2006). The contribution of core employees to organizational capabilities and efficiencies. *Human Resource Management*, 45(1): 81-109.
- Luo, Y. (2001). Antecedents and consequences of personal attachment in cross-cultural cooperative ventures. *Administrative Science Quarterly*, 46: 177-201.
- McMahan, G.C., Virick, M. & Wright, P.M. (1999). Alternative theoretical perspectives for strategic human resource management: Progress, problems, and prospects. *Research in Personnel and Human Resource Management, Supplement 4*: 88-122.
- Nahapiet, J. & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23: 242-266.



- Pelled, L.H., Eisenhardt, K.M., & Xin, K.R. (1999). Exploring the black box: An analysis of work group diversity, conflict, and performance. *Administrative Science Quarterly*, 44: 1-28.
- Ployhart, R.E., Weekley, J.A., & Baughman, K. (2006). The structure and function of human capital emergence: A multilevel examination of the ASA model. *Academy of Management Journal*, 49: 661-677.
- Ployhart, R.E., Weekley, J.A., & Ramsey, J. (2009). The consequences of human resource stocks and flows: A longitudinal examination of unit service orientation and unit effectiveness. *Academy of Management Journal*, 52: 996-1015.
- Reagans, R., Argote, L., & Brooks, D. (2005). Individual experience and experience working together: Predicting learning rates from knowing who knows what and knowing how to work together. *Management Science*, 51(6): 869-881.
- Takeuchi, R., Lepak, D., Wang, H., & Takeuchi, K. (2007). An empirical examination of the mechanisms mediating between high-performance work systems and the performance of Japanese organizations. *Journal of Applied Psychology*, 92: 1069-1083.
- Stewart, G.L. (2006). A meta-analytic review of the relationship between team design feature and team performance. *Journal of Management*, 32(1): 29-54.
- Stewart, G.L. & Barrick, M.R. (2000). Team structure and performance: Assessing the mediating role of intrateam process and the moderating role of task type. *Academy of Management Journal*, 43: 135-148.
- Subramaniam, M. & Youndt, M.A. (2005). The influence of intellectual capital on the types of innovative capabilities. *Academy of Management Journal*, 48(3): 450-463.
- Sun, L., Aryee, S., & Law, K.S. (2007). High performance work practices, citizenship behavior, and organizational performance: A relational perspective. *Academy of Management Journal*, 50(3): 228-577.
- Wright, P.M. & McMahan, G.C. (2011). Exploring human capital: Putting human back into strategic human resource management. *Human Resource Management Journal*, 21(2): 93-104.
- Wright, P.M. & McMahan, G.C. (1992). Theoretical perspectives for strategic human resource management. *Journal of Management*, 18(2): 295-320.
- Wright, P.M., McMahan, G.C., & McWilliams, A. (1994). Human resources and sustained competitive advantage: A resource-based perspective. *International Journal of Human Resource Management*, 5: 301-326.
- Wright, P.M., Smart, D.L., & McMahan, G.C. (1995). Matches between human resources and strategy among NCAA basketball teams. *Academy of Management Journal*, 38(4): 1052-1074.
- Wright, P.M. & Snell, S.A. (1991). Toward an integrative view of strategic human resource management. *Human Resource Management Review*, 1: 203-225.