

ORIGINAL RESEARCH

A Case Study Applying Lag-Sequential Analysis on Manchester City's End of Offensive Phase During the UEFA Champions League

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"In loving dedication to my two daughters, Emily and Leah Rose"



ABSTRACT

End of offensive phase with efficacy is the main aim in soccer. Limited research on Guardiola's Manchester City, catalysed this diachronic, idiographic, and multidimensional case study which applied lag-sequential analysis. All attacking behaviours of City's matches from the UEFA Champions League 2019-2020 (group stage) were obtained from INSTAT, recorded on SoccerEye and analysed by SDIS-GSEQ and Microsoft Excel. Findings show that City had a 17.07% efficacy in their attacking sequences. Having the ball in the central offensive zone induced wide shots (Fws $z=4.14$), shots on target (Fst $z=2.34$) and goals (Fgl $z=4.61$), and inhibited loss of ball possession by error of the ball carrier / defender's intervention (Fled $z=-7.74$). City's relative numerical inferiority induced loss of ball possession by error of the ball carrier / defender's intervention (Fled $z=2.49$) or loss of ball possession by intervention of the opponent's goalkeeper (Fgk $z=2.52$), while numerical equality with no pressure induced wide shots (Fws $z=3.77$) and throwing the ball out of the pitch (Fo $z=2.51$). The interactions between forward line and opponents' midline (FM; $z=2.66$) and midline with midline (MM; $z=4.18$), induced loss of ball possession by error of the ball carrier / defender's intervention. Finally, it was evident that City's goals (Fgl $z=4.63$) were induced by the ball being played between the offensive line of the attacking team and the empty zone (opponent goalkeeper) of the defending team. Besides contributing to the existing gap of scientific understanding of patterns of play in Manchester City's game, these findings shall also provide a benchmark for comparisons in future research and also a scientific foundation to discuss football match analysis.

Keywords: soccer; offensive phase; sequential analysis; case study; Manchester city

INTRODUCTION

The end of offensive phase with efficacy (Barreira, Garganta, & Anguera, 2013; Barreira, Garganta, Castellano, et al., 2013b), more specifically goal scoring, is the ultimate determinant of successful performance in soccer (Kubayi, 2020). This study conceives the end of offensive phase in the idea of football as a complex system (Gréhaigne et al., 1997), characterised by complex interrelationships between players and context (Barreira, Garganta, Castellano, et al., 2013a). At minimum, the success of an attack can be obtained if, and when, space and players choices are taken into consideration (Gréhaigne et al., 1997). For these reasons, rather than considering the players' actions disjointedly this study focuses on the complexity of the game (Sarmento et al., 2010), by looking beyond numbers and percentages, but by applying a spatio-temporal perspective to match analysis.

Purpose

Pep Guardiola is publicly renowned for the way he tactically organises his teams' tactical approach in the offensive phase (ex. Buldú et al., 2019; Segrave et al., 2018). The specific use of each department within the team, including the use of full backs more central in midfield, and the dynamic functionality of the offensive players, are a cornerstone for the attacking style in Guardiola's teams (Segrave et al., 2018). Reflecting "the emphasis put on possession by Guardiola's side", and reflecting the importance for his team to patiently look for gaps without losing the ball, in 2021, Guardiola's Manchester City was the team with the highest percentage (41.6%) of passes backwards (CIES

Football Observatory, 2021). The importance the coach puts on the offensive phase of his team, raises interest in looking deeper at the way this specific style of play in attack leads to the end of the offensive phase.

While goal scoring and goal scoring opportunities have been given substantial attention in literature (Buldú et al., 2019; Kubayi, 2020; Mitrotasios & Armatas, 2012), there is limited literature that focuses on Pep Guardiola's teams. In fact a thorough and systematic search for literature on Pep Guardiola's teams, led to only 6 publications (Buldú et al., 2019; Casals, 2011; Melo & Galatti, 2018; H. Sarmiento et al., 2011; Hugo Sarmiento et al., 2016; Segrave et al., 2018), with no quantitative and only one qualitative study, focusing on Manchester City, and with the remaining publications focusing on previous teams Guardiola was coaching.

In light of this vacuum, this case study explores the regular patterns of play (Barreira, Garganta, Castellano, et al., 2013a; Barreira, Garganta, Guimarães, et al., 2014) during the end of offensive phase of Manchester City during the group stage of the UEFA Champions League 2019-2020. Further engagement in scientific analysis of individual coaches' and teams' style and system of play like the ones explored here, may contribute to the generation of what is yet a limited field of research. Furthermore, it may contribute to pushing the field of match analysis practice and research, towards one which recognises football as a complex and dynamic system made of interactions. This can be done by taking a systemic approach to match analysis (Clemente et al., 2015), which considers the "interactions between the main variables of the different components of systems and sub-systems" of the game (Gréhaigne et al., 1997, p. 1).

Literature

In this review it was pertinent to present academic positivist approaches that have been used to present Pep Guardiola's game. Coincidentally all studies focusing on FC Barcelona.

Through eigenvector centrality, a measure of importance in the network structure, it was possible to confirm that the two central attacking midfielders in Guardiola's FC Barcelona (2009-2010), Xavi and Iniesta were central in the patterns of play administered by the team (Buldú et al., 2019). The authors demonstrate how on average, when compared to their opponents, FCB who outdid their opponents in number of points at the end of the season, had more than double the number of passes and goals and almost double the shots of their opponents. These findings have been sustained by a study on all Pep's 88 games in the UEFA Champions League between 2008 and 2016, which study found that when compared to other teams, Pep's team had more ball possession, shooting and goals (Melo & Galatti, 2018).

Buldú et al., (2019) confirmed that Barcelona used to play closer to the opponents' goal. The area covered by the initial position of the passing players, was slightly wider than their opponents' position, indicating that Barcelona use width slightly more than their opponents, and Barcelona used to pass the ball more parallel to the opponent's goal, hence less vertical (direct) than their opponents. Furthermore, the researchers showed that the connections between 'three players triangles' happens more with Barcelona than with their rivals and that the average shortest path of Barcelona was much lower, hence their players used to be closer to each other than their opponents. Guardiola's Barcelona had a higher robustness of the passing network, with a loss of passes resulting in a lower consequence than the rest of the teams. Buldú et al., (2019, p. 4) also demonstrated "that FCB attacking and defensive lines are more intermingled" than their opponents' and hence they are less "close to be split into two groups".

The researchers also discovered an interesting pattern that deserves mention in this study. They identified what they call the 'cooperation zone' and the 'helping zone'. In the helping zone, there would be a player with the ball, and another two players offering support, "forming possible triangles with a distance of 10 to 15 meters" (p. 9). Outside that circle, with a distance of around 20 meters there would be another 2 players in the co-operation area. One of the players would be slightly forward and the other player covering the back.

In a sequential analysis on F.C. Barcelona (FCB) counterattacking in the same season (2009-2010), Sarmiento et al. (2016) outlined that; (a) the start of the offensive process by regular interruption induced the use of offensive midfield zones; (b) the long pass induced behaviours related to the continuity of the offensive process; and (c) a cross from the left offensive sector induced a goal.

Delving deeper in the pattern of play of the same team during the same season, Sarmiento et al. (2011) came to additional conclusions, namely that the recovery of the ball by disarm is followed by a dribble ($z=2.24$). The recovery of the ball by intervention of goalkeeper, there is a tendency that the sequence keeps going by the right side of the pitch, in a controlled manner with the inclusion of dribble ($z=2.47$) and conduction of the ball ($z=2.71$). Furthermore, they add to say that shots with goal were induced by dribble ($z=3.32$), crossing ($z=2.82$) and intervention of opponent without efficacy ($z=3.32$).

With the limited academic work published on Pep Guardiola's teams, and with the vacuum of academic work existing on Manchester City, this study presents a deep analysis of the End of the Offensive Phase of Manchester City under the guidance of Pep Guardiola, during the UEFA Champions league 2019-2020.

METHODS

Design

The End of the Offensive Phase is a behaviour that "causes the loss of ball possession of the observed team" either 'with efficacy' or 'with no efficacy'. A team's offensive phase can be ended with efficacy through a 'wide shot' (Fws), a 'shot on target' (Fst), a 'shot stopped, with no maintenance of ball possession' (Fso) and 'goal (Fgl), while 'loss of ball possession by error of the ball carrier / defender's intervention (except to the goalkeeper)' (Fled), 'loss of ball possession by the intervention of the opponent's goalkeeper' (Fgk), 'throwing the ball out of the pitch' (Fo) and 'violation of the laws of the game' (Fi) contribute to the end of the offensive phase with no efficacy (Barreira, Garganta, & Anguera, 2013, p. 10).

This diachronic, follow-up, idiographic and multidimensional (Barreira, Garganta, Guimarães, et al., 2014; Barreira, Garganta, Machado, et al., 2014; Machado et al., 2011) study has applied observational methodology (Camerino et al., 2012), with specific reference to lag-sequential analysis (Barreira et al., 2015; Barreira, Garganta, Guimarães, et al., 2014; Decroos et al., 2018; H. Sarmiento et al., 2011). This is a method of analysis which considers time as a central factor and which makes it possible to conceptualise "social interaction

...as [a] temporal form” (Gottman & Anup, 1990, p. 3). With the necessary tools, through sequential analysis, this study was able to “represent, analyse, recode, and plot behavioural sequences” (Roger Bakeman & Quera, 2001, p. 3) as presented by the sampled matches played by Manchester City. This study is methodologically informed by a similar study focusing on the attacking game-patterns of the Spanish national football team during the World Cup 2010 (Machado et al., 2011).

This methodology made it possible to analyse regular patterns of play in the attacking phase of Manchester City during the group stage of the UEFA Champions League 2019-2020. More specifically the focus was on the End of Offensive Phase and how that related to its spatio-temporal nature.

Due to the impact Pep Guardiola’s attacking style had on the football world, it was pertinent to look at the team that Pep was presently coaching at the time of data collection, hence Manchester City. The latest UEFA Champions league was chosen at the time of data collection. While comparing between different seasons would have been another interesting study, this study was focused more on the latest developments of Manchester City’s offensive phase. The group stage of the UEFA Champions League was preferred as that provided a plausible and practical opportunity to observe all the games in the said phase of the competition. Furthermore, it made it possible to observe Manchester City playing against top teams from three different European Countries.

With this focus, this study answers the following research question; **“What were the spatio-temporal patterns in the end of offensive phase of Manchester City during the group stage of the UEFA Champions League 2019-2020?”**

More specifically through lag-sequential analysis, this study looks into answering the following sub research questions:

- *How were Patterns of Pitch Space Position (Zones) associated with the End of the Offensive Phase with Efficacy?*
- *What were Patterns of Pitch Space Position (Zones) associated with the End of the Offensive Phase with No Efficacy?*
- *How was Centre of the Game (Numerical Inferiority, Numerical Equality, Numerical Superiority) associated to the End of the Offensive Phase?*
- *How were Spatial patterns of Team Interactions associated with the End of the Offensive Phase?*
- *How was the Start of the Offensive Phase associated with the End of the Offensive Phase?*
- *How was the Centre of the Game (Numerical Inferiority, Numerical Equality, Numerical Superiority) associated with Patterns of Pitch Space Position (Zones).*

To obtain understanding of this phenomenon, 417 attacks made of a total of 8277 events (events make one whole offensive action and are categorised in (i) Start of offensive phase/ball recovery, (ii) Development of defence/attack transition-state; (iii) Progress of ball possession; (iv) End of offensive phase; (v) Pattern of pitch space position; (vi) centre of game; (vii) Spatial pattern of interaction between teams, coming from six matches Manchester City played in the group stage of the UEFA Champions League 2019-2020 (Table 1) were recorded.

Table 1. Games, Results and Number of Attacks and Events Observed

Game	Result	Attacks
<i>Shaktar vs City</i>	0 – 3	64
<i>City vs Dinamo</i>	2 – 0	79
<i>City vs Atalanta</i>	5 – 1	61
<i>Atlanta vs City</i>	1 – 1	68
<i>City vs Shaktar</i>	1 – 1	77
<i>Dinamo vs City</i>	1 – 4	68
Attacks		417
Match Events		8,277

Tools for Data Collection and Analysis

Training of how to use the software was assisted with a thorough application of “Soccer Eye Observational Instrument of the offensive phase in Soccer” official manual before official data was collected. Following a pilot process of data collection applied by the researcher, it became evident that it was necessary to clarify certain matters about how specific moments during the game were interpreted, and hence which event (button on Soccer Eye) needed to be marked in such instances. The necessary clarifications were also obtained through a set of discussions with Dr Barreira from Universidade Do Porto (Barreira, Garganta, & Anguera, 2013).

Recordings of the matches were downloaded from InStat (Kubayi, 2020). Based on the SoccerEye Observational Instrument (Barreira, Garganta, Castellano, et al., 2013b), the SoccerEye recording software was used to record every event (8277) that happened in the 417 attacks. The match status, competition stage and all the events were recorded (Barreira, Garganta, Machado, et al., 2014). The ‘restrict recording’ feature in The SoccerEye v3.2 Observational and Recording Software Interface (Barreira, Garganta, & Anguera, 2013, p. 15) was also used. The use of SoccerEye has assisted in reducing time spent in the observational process and hence in the reduction of errors when that is compared with the hand notation system (Machado et al., 2011). Furthermore, during data entry, footage was re-played as many times as necessary to make identification of analysis criteria easier to record and to ensure that coding was done in a reliable manner (Bakeman & Quera, 2001).

The Sequential Data Interchange Standard-Generalized Sequential Querier (SDIS-GSEQ) version 5.1.23 (Bakeman & Quera, 2001; Barreira, Garganta, Guimarães, et al., 2014) was used to run the Cohen’s Kappa index to obtain the intra-rater reliability and to statistically analyse the patterns of play indicated by the data. The results generated in the SDIS-GSEQ were exported into the Microsoft Excel

(Microsoft Office 365 ProPlus) for a deeper analysis of the same results. This process was necessary to make more sense and to further understand what the statistical results generated through SDIS-GSEQ meant in terms of tactical understandings.

Reliability

Like Sarmiento et al. (2010), this study looked at the stability of observation through an intra-observer agreement, obtained through the kappa reliability test. The second (15th to 30th minute of the game) and the fourth fifteen minutes (45th to 60th minute of the game) of Manchester City Vs Shakhtar, and Dinamo Vs Manchester City have been re-assessed respectively. The new set of data emerging from this re-assessment was compared to the original data obtained in the first process of assessment. That made it possible to run the kappa reliability test. That accounts for a sample size of 5.5% of the total observed match time (30 minutes from a total of 540 minutes). This second coding process was done two weeks after all the main data was coded. Reliability was evaluated by the function “compute Kappa” of the SDIS-GSEQ (Bakeman & Quera, 2001). Kappa coefficient was calculated for each of the seven criteria and for all the criteria all together (Casal et al., 2019).

The interpretation of Cohen’s Kappa (Casal et al., 2019) was used as reference (Table 2). While a weak Kappa of 0.48 was obtained when considering all categories’ data together, this study was possible through the analysis of **Start of the Offensive Phase** (B, 1.00), **End of the Offensive Phase** (F, 0.82), **Patterns of Pitch Space Position** (zones, 0.76) and **Spatial Patterns of Teams’ Interactions** (0.64), which were considered to be almost perfect, strong and moderate (McHugh, 2012), respectively (Table 3).

Table 2. The Interpretation of Cohen’s Kappa (McHugh, 2021, p. 279)

Value of Kappa	Level of Agreement	% of Data that are Reliable
.00 - .20	None	0–4%
.21 - .39	Minimal	4–15 %
.40 - .59	Weak	15–35%
.60 - .79	Moderate	35–63%
.80 - .90	Strong	64–81%
Above .90	Almost Perfect	82–100%

Table 3. Results of All Categories from Kappa in the SDIS-GSEQ

	Kappa	Agreement	Maximum Value of Kappa
Start of the Offensive Phase (B)	1.00	100%	1.00
Patterns of pitch space position (zones)	0.76	81%	0.98
Spatial patterns of teams’ interactions	0.64	77%	0.94
End of the offensive phase (F)	0.82	99%	0.87
All categories together	0.48	59%	0.87

Statistical Analysis

This study investigated the association between each type of category to understand if there were any associations within the attacking pattern of play of Manchester City in the group stage of the UEFA Champions League 2019-2020. The data was analysed through lag sequential analysis (Bakeman & Quera, 2001) in SDIS-GSEQ. This made it possible to “...determine the probability of there being significant association between different match events” (Barreira, Garganta, Machado, et al., 2014, p. 39). As shown in Table 1, this study includes 8277, which are mainly the smaller components of the 417 attacking actions analysed. Statistical significance was set at $p \leq 0.05$ and $z \geq 1.96$ (Bakeman & Quera, 2001; Sarmiento et al., 2016). When necessary, a prospective or retrospective perspective of plus or minus five lags following or preceding the primary event was applied to determine the subsequent pattern(s) of attacking play (Bakeman & Gottman, 1989; Sarmiento et al., 2016).

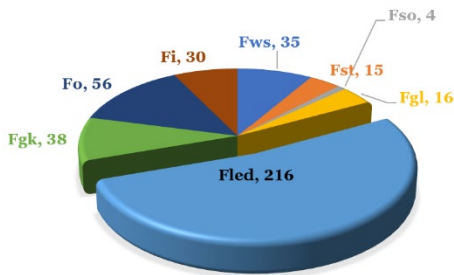
RESULTS

Manchester City scored 16 goals from 410 attacks. The 3.9% of City’s attacks ending up in a goal is a very high return when compared to the average of 1% of attacks per game ending in a goal during the 1990 World Cup (Dufour, 1993). From the 410 observed attacks, 70 (17.07%) ended with efficacy (Figure 1).

End of the Offensive Phase with Efficacy Associated to Pitch Space Position.

The end of offensive phase with efficacy (Figure 2A), showed statistical significance with ‘wide shot’ (Fws $z=4.14$), ‘shots on target’ (Fst $z=2.34$) and ‘goal’ (Fgl $z=4.61$) from zone 11. One may argue that this significance between end of offensive phase with efficacy and zone 11, is highly related to a style of play that has been observed by teams such as the Spanish national team that won the European Championship and the World cup and FC Barcelona in the years of Guardiola. While Manchester City is neither applying that style of play

nor the same principles applied by the Spanish teams, still, their efficiency in that same zone is significant, and hence one may argue that City have adopted attributes which are similar to the mentioned teams. As discussed by Athanasios (2011), Barcelona could obtain this style of play by creating superiority in numbers in the moment build up was taking place on the flanks. This superiority was obtained by Alves' forward runs, and his collaborations with Pedro, Xavi and Messi. On the left, this was done with the runs of Abidal or Maxwell/Adriano who combined with Villa and Iniesta. At City, these players were replaced by the likes of Walker, Cancelo, Mahrez and Bernardo Silva on the right, and with Mendy, Sterling and David Silva on the left. The idea of the full backs, mostly Walker, being very offensive in their approach has also been sustained by literature (Segrave et al., 2018, p. 7).



Abbreviations	
Fws	Wide shot
Fst	Shot on target
Fso	Shot stopped with no maintenance of ball possession
Fgl	Goal
Fled	Loss of ball possession by error of the ball carrier/defender's intervention, except to goalkeeper (GK)
Fgk	Loss of ball possession by the intervention of the opponent's goalkeeper
Fo	Throwing the ball out of the pitch
Fi	Violation of the laws of the game

Figure 1. Total Frequency of All the 8 Categories of the End of Offensive Phase.

End of the Offensive Phase with No Efficacy Associated to Pitch Space Position.

To give context to Manchester City's 89% passing accuracy and 21% passing inaccuracy reported in the *UEFA Champions League. Technical report 2019/20 (2020)*, one can look at the ends of offensive phase with no efficacy (Figure 2B), which were mainly associated to 'loss of ball possession by error of the ball carrier / defender's intervention (except to the goalkeeper)' (FLED) in zones 5 ($z=2.66$) and 8 ($z=6.41$), and to 'throwing the ball out of the pitch' from zone 9, which is mainly the side of Cancelo, Walker, Mahrez and Bernardo Silva.

While, as expected, there also was a very strong association between zone 11 and 'loss of ball possession by the intervention of the opponent's goalkeeper' (Fgk, $z=7.32$), it became very intriguing to notice that there is a negative association between this zone 11 and Fled ($z=-7.74$; $p < .01$). While Zone 11 is normally perceived as being very crowded, and hence an area where the ball can easily be lost, findings clearly show that it was not the case with Manchester City. This negative association, together with the association of end of the offensive phase with efficacy reported earlier (Figure 2A), could be the result of various aspects of their tactical game. First, one needs to identify the great efficacy the front five players possess (Segrave et al., 2018, p. 13). Secondly, one needs to underline that one of the tactical purposes of Manchester City's fast distribution around the opponent's back, is exactly to attract opposition out of position and create these half spaces for attacking midfielders who then run into half spaces, (Lucchesi, 2017; Mansueto, 2017) very often unnoticed, and hence with less chance to lose the ball. Finally, City are renowned for their 'patience' (Athanasios, 2011, p. 30), and for their ability to pass the ball back (CIES Football Observatory, 2021) even when they are so close to goal, if and when spaces are not available.

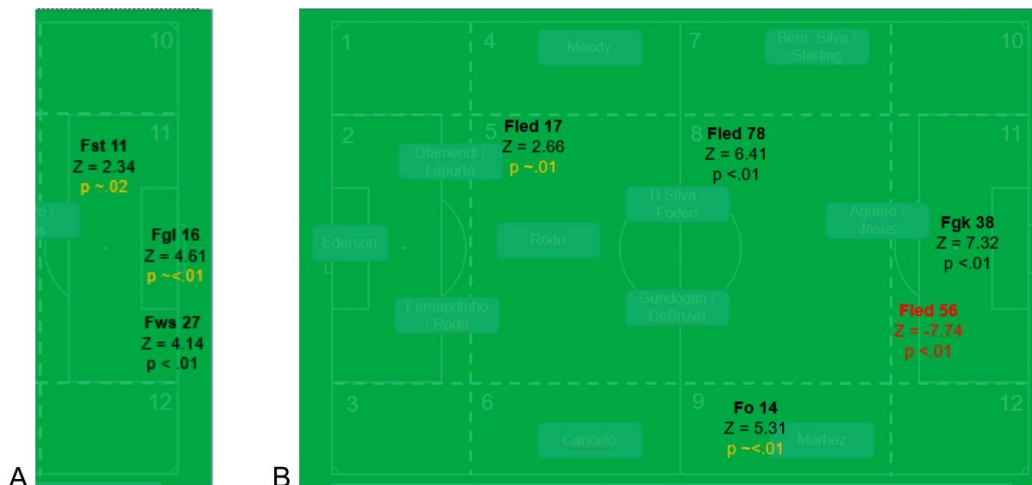


Figure 2. Sequential Data of the End of Offensive Phase with Efficacy (A) and with No Efficacy (B).

The Association of End of the Offensive Phase to Centre of the Game

End of the offensive phase with no efficacy was obtained through an association of ‘numerical equality with no pressure’ and ‘throwing the ball out of the pitch’ (Fo 14; $z=2.51$; $p=0.01$). The association of the end of the offensive phase with either Relative Numerical Inferiority or Numerical Equality with No Pressure was found to be statistically significant (Table 4). When they were in a ‘relative numerical inferiority’, Manchester City ‘lost ball possession by error of the ball carrier / defender’s intervention (exception to the goalkeeper)’ (Fled 119; $z=2.49$; $p=0.01$); and lost ball possession by the intervention of the opponents’ goalkeeper (Fgk 26 ($z=2.52$; $p\sim.01$) as already said, in Zone 11 (Fgk, $z=7.32$). Both associations indicated end of the offensive phase with no efficacy. This statistical significance found in City’s losing the ball in Zone 11 with either Relative Numerical Inferiority or Numerical Equality highlights how Manchester City’s possession patiently attracts opponents out, for them to then penetrate the created spaces through the tactical mobility in the final phase. This puts them in a position where although they lose the ball, they do so in relative numerical inferiority or numerical equality in a zone where one is expected to be in absolute numerical inferiority. When, on the other hand, City managed to tactically obtain ‘numerical equality with no pressure, they induced end of the offensive phase with efficacy, as there was a strong association with ‘wide shot’ (Fws 13; $z=3.77$; $p<0.01$).

Table 4. Results of End of the Offensive Phase in Association with Centre of the Game (Barreira et.al., 2013)

End of the Offensive Phase with Efficacy	End of the Offensive Phase with No Efficacy
Relative Numerical Inferiority (Pr):	
“The observed team has one or two influent players less than the opponent in the center of the game. Examples: 1x2, 2x4, 3x4, 3x5”	
	Fled 119 ($z=2.49$; $p=0.01$)
	Fgk 26 ($z=2.52$; $p\sim.01$)
Numerical Equality with no Pressure (NPe):	
“The observed team has the same number of players than the opponent in the center of the game. The ball carrier (Jap) has his chest oriented to the opponent’s goal, with conditions to progress into the pitch offensive zones. Example: 1x1, 3x3, 4x4.”	
Fws 13 ($z=3.77$; $p<0.01$)	Fo 14 ($z=2.51$; $p=0.01$)

The Association of End of the Offensive Phase to Spatial Patterns of Teams’ Interaction

There were four associations between the end of the offensive phase (with no efficacy) and spatial patterns of team’s interactions that were statistically significant. As shown in Table 5, there were 15 ‘lost ball possession by error of the ball carrier / defender’s intervention (exception to the goalkeeper)’ in an ‘FM’ interaction ($z=2.66$), and 87 in an ‘MM’ interaction ($z=4.18$), 11 Fo in an ‘EB’ interaction ($z=4.44$) and 33 Fgk in an ‘FE’ interaction ($z=14.81$). This might interestingly indicate how Manchester City rarely lose the ball without their defence being well set. This might draw an important attention to Guardiola’s work on preventive marking, which is not so often discussed.

Table 5. Results of End of the Offensive Phase in Association with Centre of the Game (Barreira et.al., 2013)

End of the Offensive Phase with Efficacy	End of the Offensive Phase with No Efficacy
FM: “The ball is played between the offensive line of the attacking team and the midline of the defending team”.	
	Fled 15 ($z=2.66$; $p\sim.01$)
MM: “The ball is played between both teams’ mid lines”.	
	Fled 87 ($z=4.18$; $p<.01$)
EB: “The ball is played between the exterior zone of the offensive line of the attacking team and back line of the defending team”.	
	Fo 11 ($z=4.44$; $p\sim<.01$)
FE: “The ball is played between the offensive line of the attacking team and the empty zone (opponent goalkeeper) of the defending team”.	
Fgl 8 ($z=4.63$; $p\sim<.01$)	Fgk 33 ($z=14.81$; $p\sim<.01$)

With 16 goals in 6 matches, Manchester City had an average of 4 goals per match, when compared to the overall 3.24 goals per match happening in the Champions League 2019-2020 (*UEFA Champions League. Technical report 2019/20.*, 2020). Out of these 16 goals, 8 were part of an important interaction that led to end of the offensive phase with efficacy with a strong statistical significance. All these 8 goals (50%; Fgl z=4.63) happened in an 'FE' interaction. This meant that there is a significant pattern in the way Manchester City get to a goal. This not only sustains the mobility that has been discussed earlier. This also supports the analysis by Segrave et al. (2018) which outlines both the importance of clinical strikers, but also of the same strikers evacuating their familiar zones to create spaces for their teammates and find goal scoring opportunities by getting the ball in the offensive line in "the empty zone" (Barreira, Garganta, Castellano, et al., 2013a, p17-22). This is factually supported by the 6 goals scored by the strikers with the remaining 10 scored by another 5 players (Segrave et al., 2018; UEFA.com, 2020).

The Association of 'The End of the Offensive Phase' with 'Start of the Offensive Phase'

End of offensive phase was induced by ball recovery situations but inhibited by 'lost ball possession by error of the ball carrier / defender's intervention (exception to the goalkeeper) (Fled). Differently from research conducted by Barreira (2013), this study found no statistical significance for the association between the start of the offensive phase and goal scoring (Fgl). This could be attributed to the 'patience' strategy (Athanasios, 2011, p. 30) within Manchester City's possession. There might be too many passes between the winning of the ball and the eventual goal, for the data to show significance between the two variables. Table 6 presents findings (**black** for positive and **underlined** for negative associations) alongside findings emerging from existing published literature (**shaded**).

Table 6. Results of Start of Offensive Phase (Br) with End of Offensive Phase (F) (Black** or **Underlined** for Positive or Negative Sequential Associations, respectively) Alongside Findings Emerging from Existing Published Literature (**shaded**) (Bakeman & Gottman, 1989; Sarmento et al., 2016).**

	BRI	BRt	BRgk	BRp	BRst	BRv	BRgki	BRti
Fws			-9 (z=2)					
Fst				<u>(z=3.23)</u>				
Fso								
Fgl		<u>(z=2.62)</u>						
Fled			<u>-1</u> (z=-2.42)	<u>(z=-3.29)</u>	<u>-7</u> (z=-2.44)		<u>-4</u> (z=-3.08)	<u>-4</u> (z=-1.99)
Fgk			-6 (z=2.73)					
Fo	<u>(z=-2.65)</u>		-2 (z=2.92) -9 (z=2.45)		-3 (z=2.12) -6 (z=2.15) -7 (z=2.44)		-4 (z=4.47)	-6 (z=2.15)
Fi		-6 (z=2.73)	-1 (z=3.16) -8 (z=3.16)		-2 (z=3.74)	-10 (z=2.64)		

This, more specifically, start/restart of offensive phase shows a significance in Manchester City's ability to keep the ball as to the significant inhibition of Fled, which is potentially known for the fact that one of Pep's attacking strategy is that of overload to attract opponents, and then attacking from the other side, hence less possibility to lose the ball (Segrave et al., 2018). This brings in an evident principle of play which leads City not getting under absolute pressure, possibly assisted through their mastery of going backwards to play forward (Poli et al., 2021), and to play away from traffic to retain ball possession. As said earlier (Table 5) there is statistical significance of City's Fled when in 'relative numerical inferiority' (Pr), but there is no significance of that happening when City are in 'absolute numerical inferiority' (Pa). Hence, while results show significance in the association between City's Fled and when they had "one or two influent players less than the opponent in the centre of the game" (Pr), there was no significance between their Fled and when they "had at least less than three or more influent players in relation with the opponent in the centre of the game" (Pa) (Barreira, Garganta, & Anguera, 2013, pp. 14–15).

The Association of 'The Centre of the Game' with 'Patterns of Pitch Space Position'

Guardiola's game philosophy of overloading one side of the pitch to attack from the other side (Segrave et al., 2018, pp. 6–7) made it very appealing to try to understand what is the association that exists between the 'patterns of pitch space position' and 'centre of the game' (Barreira et al., 2012).

The negative associations of 'the Centre of the Game' to the 'Patterns of pitch space position' (zones) were analysed. Results in figure 5 show that zones 1 to 7 and zone 9 inhibited relative numerical inferiority (Pr), zones 1 to 5 inhibited numerical equality with no pressure (NPe), while zone 5 inhibited situations with absolute numerical inferiority (Pa) or numerical quality with pressure (Pe).

"Modern elite teams [have] more difficulties to create favourable numerical contexts" (Barreira et al., 2015, p, 59), in high areas of the pitch. In line with this, this study shows that closer to the opponents' goal (zones 7, 8, 9, 10, 11 and 12), relative numerical superiority (NPr) and absolute numerical superiority (NPa) were inhibited. Furthermore, absolute (Pa) and relative (Pr) numerical inferiority, were only statistically significant in zones 8 (Pr z=6.26, n = 483), zone 12 (Pr z=3.17, n = 59; Pa z=2.41, n = 4), and as expected in zone 11

(Pr z=29.46, n = 350; Pa z=11.31, n=22). It is here pertinent to underline the interaction between this finding showing absolute and numerical inferiority in zone 11, but yet, as mentioned earlier, there is a negative association between this zone and Fled (Figure 3).

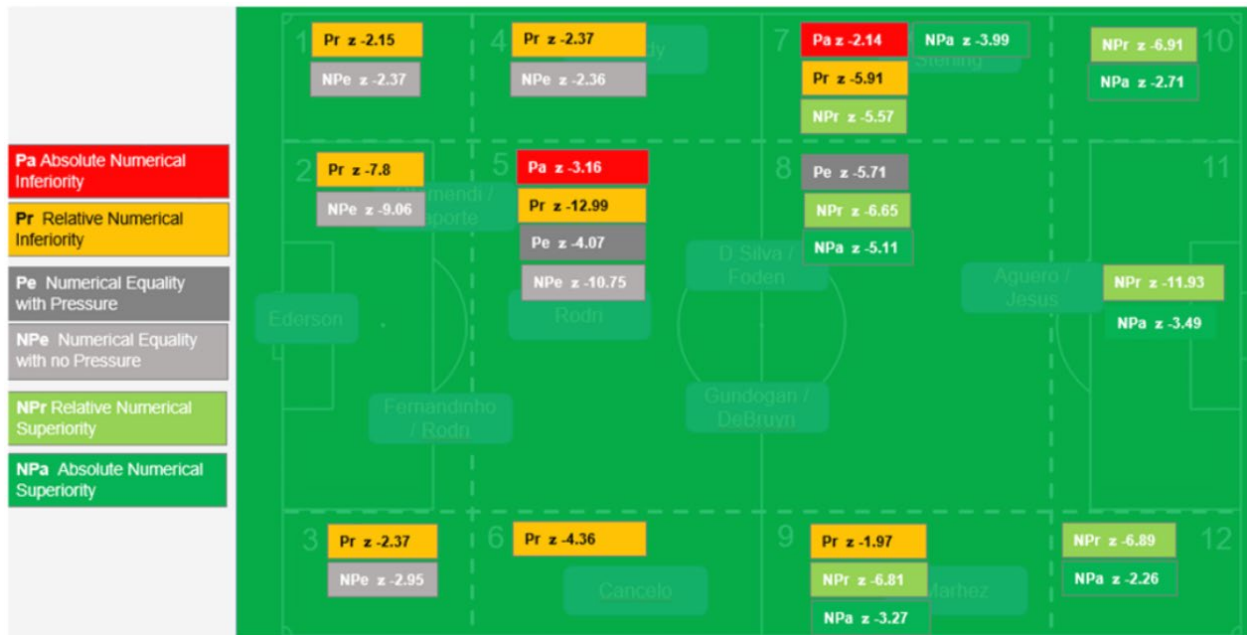


Figure 3. Results of the Negative Associations of the Center of the Game to Patterns of Pitch Space Position.

The positive associations of ‘the Centre of the Game’ (Pa, Pr, Pe, NPe, NPr, NPa) to the zones (Figure 4) almost show a mirror image of the association shown above. Zones 1,2,3,4,5 and 6 induced situations with relative or absolute numerical superiority. Zone 4, however, induced situations of numerical equality with pressure, which could be showing a significance of where Manchester City got pressed. Zones 7, 9 and 10 show a higher association with numerical equality with and with no pressure. This is a strong indicator of Manchester City’s attempt to shift the ball fast to obtain 1v1 or 2v2 opportunities on the wings, both with fast and effective wingers and with the addition of attacking minded full backs (Segrave et al., 2018). Zones 8 and 12 were associated only with numerical equality with no pressure and numerical equality with pressure, respectively.

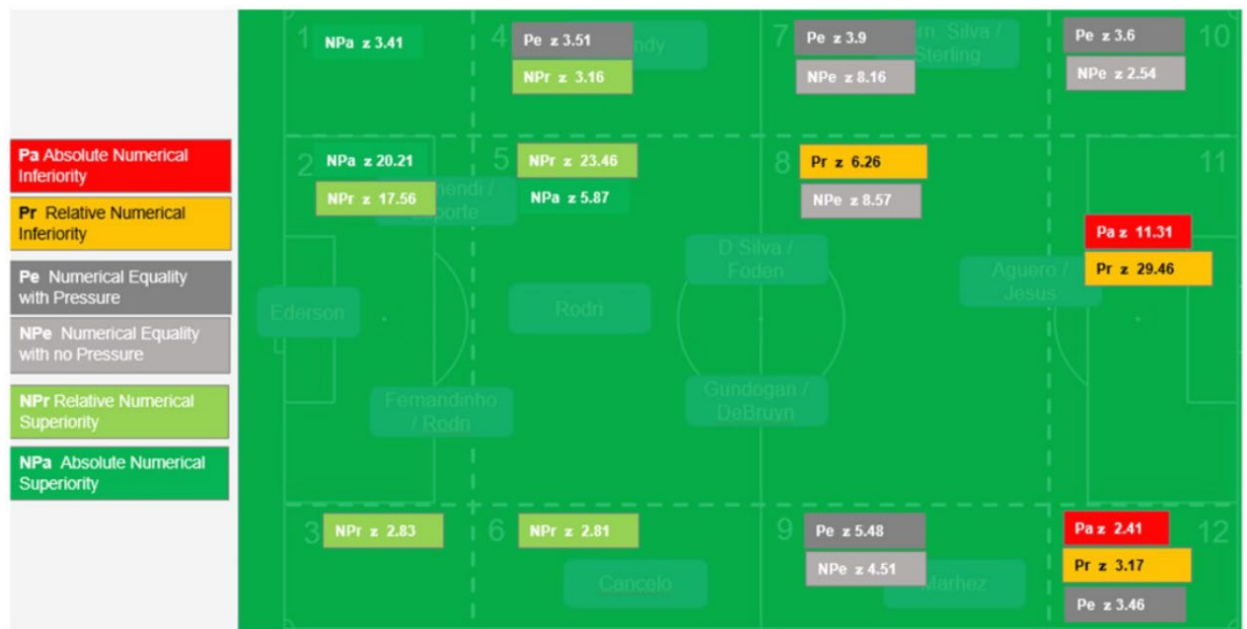


Figure 4. Results of the Positive Associations of the Center of the Game to Patterns of Pitch Space Position.

In the defensive sector (zones 1, 2 or 3) Manchester City were able to build up play with a negative association to PA and NPe (zones 1, 2 or 3) and with positive association to NPa (zones 1 & 2) and NPR (zones 2 & 3). This is further sustained by situations of NPa and NPR in zones 1 and 2, and in zones 2 and 3, respectively (Figure 3).

In the mid-defensive sector (Barreira, Garganta, & Anguera, 2013) City's attacking play was negatively associated with Pr and NPe (Zone 4), Pr (Zone 6) on the flanks, and with Pa, Pr, Pe and NPe in the central part of the mid-defensive sector. When they were in the mid-defensive sector, City managed to develop play by assuring they did not get in absolute or relative numerical inferiority and numerical equality with or with no pressure, and by having relative numerical superiority (NPr; zones 4, 5 and 6) and absolute numerical superiority (NPa; zone 5). Another important association of numerical equality with pressure was found in zone 4, which, as argued earlier, could have been a strategic position where City were pressed by their opponents when their full back received the ball. It could also be known to the fact that their right back (mainly Walker) is "extremely attack oriented" (Segrave et al., 2018, p. 7) hence might have received the ball in zone 6 less than the opposite full back who may have received the ball more in zone 4, and hence giving the opportunity to opponents to press him.

It is also important to add that these findings of numerical superiority in zone 5 may be attributed to at least the following points.

1. Possibly City's opponents were withdrawing early in the defensive phase, and hence they were already below their midline pitch, hence it stands to reason that City were with more numbers in their mid-defensive sector.
2. It is possible that the fact that City were sometimes raising a Centre Back to add numbers in midfield (Rodri, No 16, was doing this against Atalanta), or get the inverted full backs (Segrave et al., 2018), who may arguably be better called half-backs (Cox et al., 2020), could be adding numbers in the central mid-defensive sector (zone 5).
3. Through their 'patience' strategy (Athanasios, 2011, p. 30), Manchester City did repeatedly pass the ball back to their Centre Backs (CBs) if they did not find the gaps to penetrate higher up the pitch.

As shown in Figure 5, the mid-offensive sector (zones 7, 8 and 9), saw an increase in the negative association with relative and absolute numerical superiority. Furthermore, zones 7, 8 and 9 had an increased association with numerical equality with and with no pressure. Zone 8 was also the first zone to induce relative numerical inferiority, which is defined as when "the observed team has one or two influent players less than the opponent in the centre of the game" (Barreira, Garganta, & Anguera, 2013, p. 14). While this increased significance in situations with numerical inferiority in zone 8, is in actual fact expected, it is equally interesting to highlight that on the flanks (zone 7 and 9), City still managed to inhibit 'absolute (Pa; $z=-2.14$) and relative (Pr; $z=-5.91$, $n = 69$) numerical inferiority' in zone 7, and similarly inhibiting 'relative numerical inferiority' (Pr; $z=-1.97$, $n = 81$) in zone 9. This could be known to the movements of both CAMs in between the lines and between the opposing full backs and central backs, and also to the higher movements of the full backs (Segrave et al., 2018).

Finally, the offensive sector (zones 10, 11, 12) inhibited absolute (NPa) and relative (NPr) numerical superiority. 'Numerical equality with (Pe) or with no (NPe) pressure' were induced in zone 10, 'absolute numerical inferiority' (Pa) and 'relative numerical inferiority' (Pr) were induced in zones 11 and 12, while 'numerical equality with pressure' was also induced in zone 12.

CONCLUSION

During the group stage of the UEFA Champions League 2019-2020, Manchester City's end of offensive phase was made of 82.92% with no efficacy and 17.07% with efficacy. The end of offensive phase with efficacy was highly associated with Zone 11 (Fws $z=4.14$; Fst $z=2.34$; Fgl $z=4.61$). The same zone was negatively associated with 'loss of ball possession by error of the ball carrier / defender's intervention' ($z=-7.74$). On the other hand, zones 5 (Fled $z=2.66$) zone 8 (Fled $z=6.41$), zone 9 (Fo $z=5.31$) and zone 11 (Fgk $z=7.32$), induced the end of offensive phase with no efficacy. 'Relative numerical inferiority' induced 'loss of ball possession by error of the ball carrier / defender's intervention' (119; $z=2.49$; $p=0.01$) and 'loss of ball possession by the intervention of opponent's goalkeeper' (26; $z=2.52$; $p\sim.01$), while 'numerical equality with no pressure' induced 'wide shot' (13; $z=3.77$; $p<0.01$), and 'throwing ball out of the pitch' (14; $z=2.51$; $p=0.01$).

City's 'loss of ball possession by error of the ball carrier / defender's intervention' was associated with the interaction between Manchester City's forward line and opponents' midline (FM; $z=2.66$) and the interaction between midline to midline (MM; $z=4.18$). The interaction between the exterior zone of the offensive line with the opponents' backline (EB) induced 'throwing the ball out of the pitch' ($z=4.44$), while the interaction between ball in the offensive line (F) and the Empty Zone (E) was associated to 'loss of ball possession by the intervention of opponent's goalkeeper' ($z=14.81$). Finally, one can notice that there was a high association of relative and absolute numerical superiority, and a negative association of absolute and relative numerical inferiority with the zones in the defensive sector and mid-defensive sector. The mid-offensive sector shows a still positive, but lower association, while the offensive sector, mainly zones 11 and 12 have a high association with absolute and relative numerical inferiority, and a negative association with numerical superiority.

CONTRIBUTIONS, IMPLICATIONS, AND SUGGESTIONS

This paper contributes by filling in an existing gap of academic literature focusing on Pep Guardiola's Manchester City. This empirical study presents some theoretical and practical implications. First, its method promotes the idea for sports coaches, match analysis and researchers focusing on match analysis to go "beyond traditional analysis of frequency of sports behaviours" (Hugo Sarmento et al., 2010, p. 406), and instead delve deeper into conceiving football as a complex system (Gréhaigne et al., 1997). While it may be useful in informing coaching practice and to present values that can be used as normative data (Mitrotasios & Armatas, 2012), it is more contextual and realistic to move away from simple description and associations between variables, and consider the possible interactions between variables,

considering the dynamic, interactive and complex systems' aspects that can better characterise match performance in football (Sarmiento et al., 2014).

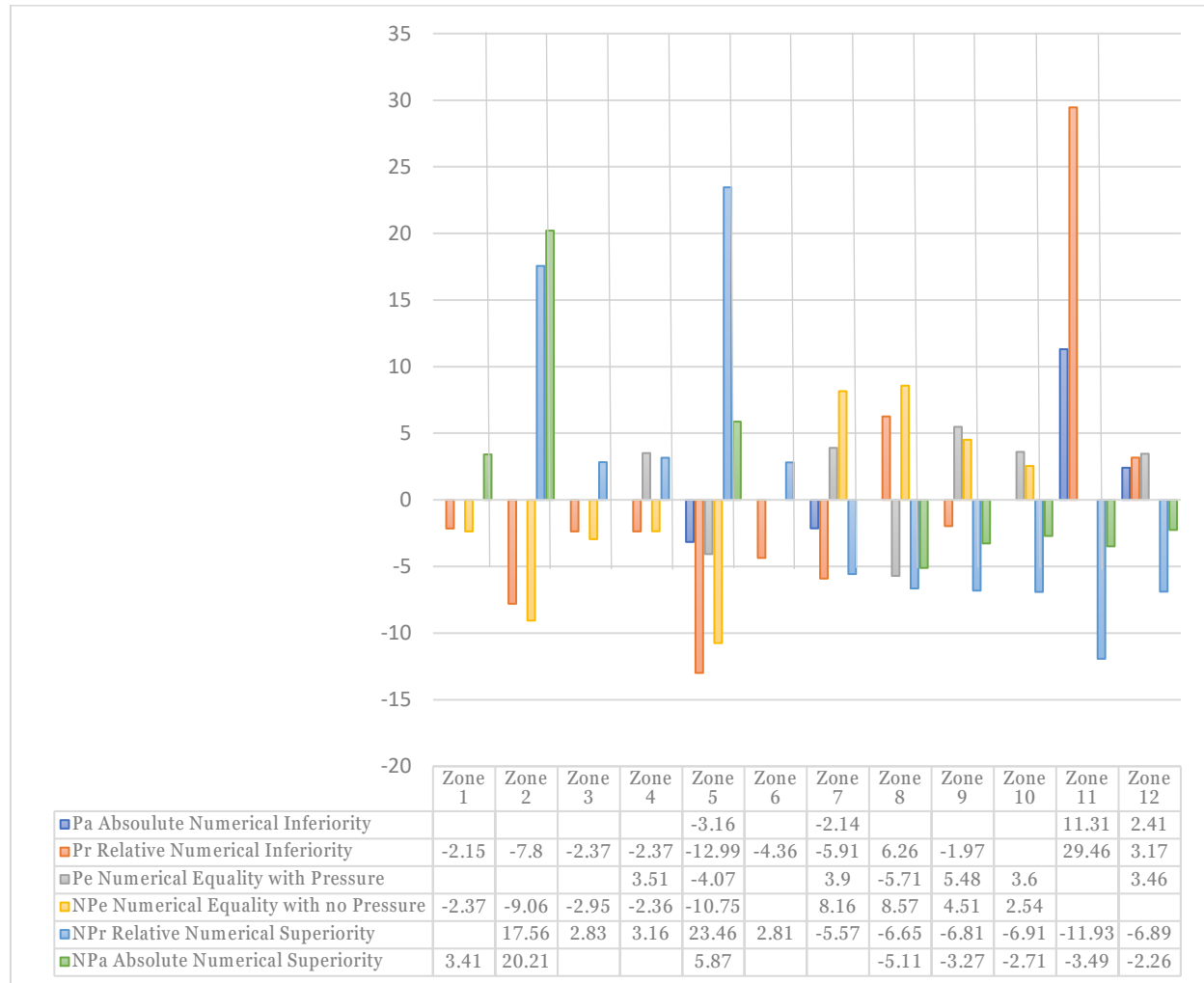


Figure 5. Results of the Positive and Negative Associations of the Center of the Game to Patterns of Pitch Space Position.

Furthermore, considering the limitations this study might have in it presenting a case study of just one team in one phase of a competition, it is hereby argued that as more researchers adopt and apply the methodology to additional games, then, important insights can be revealed about broader and more overarching trends, enabling a form of comparative analysis that would facilitate inferences about contracting styles between teams, leagues and larger interconnected football philosophies and cultures.

With this insight this study can practically imply that the interactions between space, interactions and behaviours were pertinent in underlining Manchester City's end of the offensive phase. These findings can in fact imply that Manchester City's end of offensive phase with efficacy is related to zone 11, through forward mobility, which might be benefiting from City's ability to obtain numerical equality on the flanks (zones 7, 9 and 10). Furthermore, findings show that it is not probable that City will lose the ball in zone 11, unless they are in a 1v1 against the Goalkeeper, in which case, the ball is lost by intervention of the opponent's goalkeeper, following an interaction between City's offensive line and the opponent's goalkeeper (E). This shows both the technical ability of Manchester City's players attacking the penalty box, but also their mastery to pass backwards to play forward (Poli et al., 2021) again later on, which leads them to always pass away from traffic, to retain possession of the ball.

Finally, it is hereby suggested that future research, should take in consideration various factors such as type of competition, stadium location, home and away advantages and disadvantages, opponent quality, partial results and number of players on the field exploring statistical significance of a team/teams' offensive phase in relation to these factors, would contextualise findings and understandings even more.

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