



MASTERARBEIT | MASTER'S THESIS

Titel | Title

From Steps to Stories: Motion Capture Insights into the Dynamic Greek
Dance Traditions -Unveiling Cultural Identities Beyond Borders in Pontos,
Crete, and Epirus

verfasst von | submitted by

Eftropios Karagkiozis

angestrebter akademischer Grad | in partial fulfilment of the requirements for the degree of
Master of Arts (MA)

Wien | Vienna, 2025

Studienkennzahl lt. Studienblatt |
Degree programme code as it appears on
the student record sheet:

UA 066 647

Studienrichtung lt. Studienblatt | Degree
programme as it appears on the student
record sheet:

Masterstudium Digital Humanities

Betreut von | Supervisor:

Dr. Jörg Mühlhans B.A. M.A.

Abstract

Background: Traditional Greek dances serve as repositories of collective memory and regional identity, yet their distinctive kinematic properties have never been systematically quantitatively documented or compared across regions. This gap limits our understanding of how cultural transmission shapes embodied movement traditions and prevents systematic comparison across regional characteristics.

Objective: This study uses motion-capture recordings of 5 traditional dances (x 2 versions of each dance) from Crete, Epirus, and Pontos to quantify statistical metrics. Fluidity, complexity, average velocity, mean absolute acceleration, and hand and foot velocities are implemented in order to investigate regional movement signatures.

Methods: Motion-capture generated data from 7 subjects performing authentic traditional dances were processed using reflective markers measurements. Complexity was measured by the normalized Shannon entropy of PCA-decomposed trajectories. Fluidity was defined as the mean velocity divided by the mean absolute acceleration. Statistical analyses included one-way ANOVA, Welch's and Kruskal-Wallis tests, independent-samples t-tests, Tukey post-hoc comparisons, and bootstrapped confidence intervals to assess regional differences and musical influences.

Results: Regional signatures were highly pronounced across multiple metrics (fluidity across regions: $F(2,207)=104.66$, $p<.001$, $\eta^2=0.50$; complexity across regions: Welch's $F(2,115)=3.16$, $p=.046$). Epirus exhibited the highest fluidity and lowest velocity. Crete showed the fastest footwork. Pontos displayed dramatic hand acceleration. Musical tempo strongly modulated movement fluidity ($t=17.10$, $p<.001$, Cohen's $d=2.47$), while odd versus even meter effects were subtler but detectable. All metrics demonstrated high consistency across multiple recordings (Cohen's $d<0.2$), confirming measurement reliability.

Conclusions: Quantitative kinematic profiling successfully confirms the reliability of motion capture in depicting cultural biomechanics that distinguish regional styles. The current method provides a scalable framework for comparative dance research that bridges anthropological and biomechanical perspectives, presenting new possibilities for cross-cultural movement studies and digital preservation of intangible cultural heritage.

Keywords: Greek folk dance; motion capture; fluidity; complexity; PCA entropy

Table of Contents

INTRODUCTION	8
HISTORICAL CONTEXT. CRETE, PONTUS, AND EPIRUS: INTEGRATION OF THE THREE REGIONS WITHIN THEIR HISTORICAL FRAMEWORK DURING THE BYZANTINE ERA AND EXAMINATION OF THEIR INTERACTIONS.....	12
1.1 ARAB RULE IN CRETE: CONQUEST AND ADMINISTRATION	13
1.1.1 THE SARACENS IN CRETE	13
1.1.2 CHARACTER OF THE ARAB OCCUPATION.....	14
1.1.3 PRESERVATION OF GREEK IDENTITY	15
1.2 THE BYZANTINE CAMPAIGN OF 960–961	17
1.2.1 PREPARATION OF THE CAMPAIGN	17
1.2.2 THE FORCE OF THE CAMPAIGN	17
1.2.3 JOURNEY TO CRETE	18
1.3 THE CAPTURE OF CHANDAX AND THE CONSEQUENCES OF THE RECONQUEST	19
1.3.1 CAPTURE AND CLEANSING OPERATIONS.....	19
1.3.2 RESETTLEMENT OF POPULATIONS & STRENGTHENING OF THE CHRISTIAN ELEMENT	20
1.4 ECCLESIASTICAL REORGANIZATION AND MISSIONARY ACTIVITY	21
1.4.1 THE ROLE OF NIKEPHOROS PHOKAS.....	21
1.4.2 SAINT NIKON “HO METANOEITE” (“YOU SHOULD REPENT”).....	22
1.5 POPULATION MOVEMENTS IN LATER YEARS: THE RELATIONSHIP BETWEEN CRETE AND PONTUS	25
1.6 MIDDLE BYZANTINE EPIRUS (7TH–12TH CENTURY AD): HISTORICAL ELEMENTS, ARAB RAIDS, RELATIONS WITH THE EMPIRE.....	28
1.6.1 EARLY DISTURBANCES (7 TH – 8 TH CENTURY).....	28
1.6.2 FORMATION OF ADMINISTRATIVE STRUCTURES AND REORGANIZATION (8 TH – 10 TH CENTURY AD)	29
1.6.3 THE ARAB THREAT AND COASTAL DEFENSE NEEDS.....	30
1.6.4 THE RECONSTRUCTION OF THE 11 TH – 12 TH CENTURY.....	31
1.6.5 FROM THE LATE MIDDLE BYZANTINE PERIOD TO THE DAWN OF THE LATE BYZANTINE PERIOD (LATE 12 TH – EARLY 13 TH CENTURY)	32
THEORETICAL BACKGROUND.....	33
2.1 THE ESSENCE OF DANCE AND ITS ORIGIN.....	34
2.2 THE FUNCTIONALITY OF DANCE IN TRADITIONAL SOCIETY	44
2.3 THE TRADITIONAL GREEK FESTIVAL ‘PANEGYRI’ AS A SOCIAL-CULTURAL PHENOMENON AND PREMIER EVENT IN GREEK TRADITIONAL SOCIETY	46
2.4 GREEK TRADITIONAL MUSIC AND ITS RELATIONSHIP WITH ANCIENT AND BYZANTINE TRADITION	51
2.5 IDENTIFYING EXCELLENCE IN TRADITIONAL DANCE: A METHODOLOGICAL FRAMEWORK	60
2.6 DIFFERENTIATION BETWEEN TRADITIONAL AND FOLKLORIC DANCE	62
2.7 RECORDING PRACTICES: STEPS AND METHODS	66
2.8 PARTICIPANT OBSERVATION METHODOLOGY	68

2.9 INTERVIEW TECHNIQUES AND ORAL HISTORY	69
2.10 THE RELATIONSHIP BETWEEN MUSIC AND DANCE	70
2.11 DATA PROCESSING AND INTERPRETATION.....	70
2.12 COMPARATIVE RESEARCH: JUSTIFICATION OF THE SELECTION OF THE THREE REGIONS CONCERNED AND ANALYTICAL DESCRIPTION OF SELECTED DANCES	73
2.12.1 METHODOLOGICAL FRAMEWORK AND SELECTION CRITERIA.....	73
2.12.2 THEORETICAL BASIS FOR REGIONAL SELECTION.....	74
2.12.3 REGIONAL CHARACTERISTICS AND DANCE TRADITIONS.....	75
2.13 DESCRIPTION OF DANCES SELECTED AND RECORDED FOR THE NEEDS OF THE PRESENT RESEARCH	79
2.13.1 DANCES OF EPIRUS.....	79
I. Syrtos sta dyo (Deropolitissa/Trigona)	79
II. Syrtos sta tria.....	80
III. Zagorisios	81
IV. Perdikomata.....	82
V. Tsamiko of Konitsa	82
2.13.2 DANCES OF CRETE.....	83
I. Siganos	83
II. Syrtos Chaniotis.....	84
III. Maleviziotis	84
IV. Prinianos of Eastern Crete	85
V. Pentozalis	86
2.13.3 DANCES OF PONTUS	87
I. Tik Diplo and Tik Tromakton	87
II. Kotsari	88
III. Omal Trapezountas.....	88
IV. Trygona	89
V. Letsina.....	90
RESEARCH METHODOLOGY AND EXPERIMENTAL SETUP	91
3.1 MOTION CAPTURE TECHNOLOGY	91
3.1.1 MEDIALAB EQUIPMENT	91
3.1.2 THE QUALISYS SYSTEM: TECHNICAL OPERATION AND CAPABILITIES.....	93
3.1.3 AIM MODEL TRAINING PROTOCOL.....	97
3.1.4 DATA ACQUISITION AND MANAGEMENT	97
3.1.5 TRIANGULATION PROCESS	98
3.1.6 DATA CLEANING: MANAGING GAPS AND GHOSTS.....	99
3.2 DATA COLLECTION PROTOCOL	99
3.2.1 SUBJECT SELECTION CRITERIA.....	99
3.2.2 DISCUSSION OF “PROFESSIONAL” STATUS IN GREEK TRADITIONAL DANCE CONTEXT.....	100
3.2.3 NUMBER OF PARTICIPANTS	101
3.2.4 AUDIO RECORDING PROCESS AND AUDIO SYNCHRONIZATION.....	102
3.2.5 DISTINCTION BETWEEN SLOW AND FAST DANCES.....	102
3.2.6 LABORATORY PERFORMANCE AREA SETUP.....	103
3.3 METHODOLOGICAL LIMITATIONS	104
3.3.1 COSTUME CONSIDERATIONS AND POTENTIAL IMPACT ON DATA.....	104
3.3.2 SPATIAL LIMITATIONS AND IMPACT ON MOVEMENT RANGE.....	105

3.3.3 REGIONAL VARIATION CHALLENGES	105
3.3.4 IDEAL VERSUS ACTUAL REGIONAL REPRESENTATION. THE CHOICE OF THE DANCERS	106
STATISTICAL ANALYSIS AND RESULTS.....	107
4.1 DATA PROCESSING PIPELINE - ARCHITECTURE AND CONFIGURATION	108
4.1.1 DATA INGESTION AND PREPROCESSING	109
4.1.2 QUALITY CONTROL AND DATA ENRICHMENT	110
4.1.3 KINEMATIC METRIC COMPUTATION	110
4.1.4 VIRTUAL MARKER COMPUTATION	112
4.1.5 DESCRIPTIVE STATISTICS AND VISUALIZATION	112
4.1.6 STATISTICAL ANALYSIS FRAMEWORK	112
4.1.7 RESULTS AGGREGATION AND EXPORT	113
4.1.8 SOFTWARE AND STATISTICAL TOOLS.....	114
4.2 REGIONAL VARIATIONS IN MOVEMENT CHARACTERISTICS.....	115
4.2.1 MOVEMENT FLUIDITY	115
4.2.2 MOVEMENT COMPLEXITY	117
4.2.3 VELOCITY PATTERNS.....	119
4.2.4 REGIONAL MOVEMENT SIGNATURES	121
4.3 MUSICAL INFLUENCES ON MOVEMENT	123
4.3.1 TEMPO EFFECTS.....	123
4.3.2 METER TYPE EFFECTS	126
4.4 RELIABILITY AND INDIVIDUAL VARIATION	128
4.5 CORRELATIONAL PATTERNS	131
4.6 SYNTHESIS OF FINDINGS	133
RESEARCH CONTRIBUTION AND FUTURE PERSPECTIVES	135
5.1 METHODOLOGICAL INNOVATION AND RESEARCH CONTRIBUTION	135
5.1.1 DOCUMENTATION OF REGIONAL CHARACTERISTICS	136
5.1.2 BIOLOGICAL SEX'S INFLUENCE ON MOVEMENT EXECUTION	137
5.1.3 RHYTHM AND MOVEMENT RELATIONSHIP	138
5.2 FUTURE RESEARCH DIRECTIONS AND POTENTIAL APPLICATIONS	139
5.2.1 EXPANDED COMPARATIVE ANALYSIS	139
5.2.2 HISTORICAL MOVEMENT ANALYSIS	140
5.2.3 EDUCATIONAL APPLICATIONS.....	141
5.2.4 CULTURAL HERITAGE PRESERVATION	142
5.3 METHODOLOGICAL RECOMMENDATIONS FOR FUTURE RESEARCH	143
5.4 FINAL OBSERVATIONS: THE PROMISE OF MOTION CAPTURE TECHNOLOGY.....	144
CONCLUSION	145
LITERATURE	148

Introduction

Traditional dance represents far more than artistic expression or entertainment. It constitutes an integral component of the traditional Greek society, functioning as a sophisticated tool through which communities organize, preserve, and transmit their collective knowledge and cultural values. In traditional Greek communities, dance served as an inseparable element of daily life, present not only during formal celebrations and festivals but woven into the fabric of everyday existence, from agricultural work to domestic gatherings.¹ This comprehensive integration distinguishes traditional dance from its contemporary folkloric counterparts, positioning it as a fundamental social institution rather than a peripheral, occasional activity. The traditional community represented a self-contained cultural universe, encompassing individuals from birth to death within a coherent system of beliefs, practices, and social relationships. Dance functioned there as both a mirror and a mechanism of social organization.

Within these traditional frameworks, dance operated as a comprehensive social technology, organizing community relationships through spatial arrangements, temporal sequences, and gestural vocabularies that encoded hierarchies, structures, and cultural values. The village festivals (*πανηγύρια*) served as the primary arena for this cultural phenomenon. In most cases, they functioned as an annual gathering that brought together not only local residents but also emigrants who traveled great distances to participate in their community's most significant celebration.² These festivals represented far more than entertainment. They constituted laboratories of cultural reproduction where social codes were reinforced, relationships negotiated, and collective identity reaffirmed through shared movement. The carefully predefined order of dancers, the specific hand positions and stepping patterns, as well as the protocols governing participation, all reflected and reinforced the social structures that governed daily community life.

¹ Alkis Raftis. *“Ο Κόσμος του Ελληνικού Χορού”*. (Athens: Polytypo, 1985).

² Ibid.

The present study focuses specifically on three distinct geographic regions, Epirus, Crete, and Pontos, each representing unique cultural traditions while sharing common Greek heritage. This geographic scope enables systematic comparison across the three regions, as well as comparisons among individual practitioners (i.e., the subjects who participated in the motion capture recordings) and musical compositions. In this way, both the diversity and underlying unity that characterizes Greek traditional dance are has been attempted to be revealed. Each region developed its very own choreographic vocabulary through centuries of autonomous evolution while, in some cases at least, maintaining cultural exchange with neighboring areas. They created in this way what scholars describe as distinct regional dialects within a broader cultural language.³ The selection of these particular regions reflects their historical significance and the preservation of distinctive traditional practices that illuminate broader patterns of Greek cultural development. Epirus, with its mountainous terrain and polyphonic singing traditions, developed dance forms that reflect both the rugged landscape and the complex social relationships of pastoral communities. Crete, as the largest Greek island with a tradition of heroism and resistance, cultivated dance forms characterized by their energetic, almost martial qualities and endless possibilities for individual variation. Pontos, representing the Asia Minor Greek experience, maintains distinctly Greek characteristics developed over more than two millennia of continuous settlement.

The theoretical framework underlying this research positions dance as both a social practice and cultural expression, where movement functions as a dynamic repository of collective memory.⁴ Dance operates as what researchers term the “memory of society,” actively carrying forward knowledge and historical understanding through embodied practice rather than written documentation.⁵ This perspective emphasizes dance's role as a means of reading social and cultural

³ Ibid.

⁴ Fotios Mavrovouniotis, Alexandros Malkogeorgos, and Eirini Argyriadou. *“Ελληνικοί Χοροί”*. (Thessaloniki: Ekdotiki Aiginou, [2006]).

⁵ Alkis Raftis, ed., *Dance and Oral History* (Ioannina: Municipality of Saint Dimitrios Ioannina and the International Organization of Folk Art – Greek Section, 2001).

life. The choreographic patterns encode community structures, value systems, and interpersonal relationships that extend far beyond the dance circle itself. The transmission of traditional dances has not been documented in writing. So, it relied fundamentally on collective memory.

The concept of the authentic traditional dancer emerges from this framework. That is a person for whom dance represents an inseparable part of life experience, intimately connected with personal memories, community relationships, and cultural identity. What really sets authentic dancers apart is their ability to demonstrate what scholars identify as improvisation within established parameters, meaning the ability to elaborate and extend local movement vocabularies while respecting the implicit boundaries that define regional style.⁶ This improvisational capacity distinguishes authentic traditional practice from contemporary folkloric presentation, where dance becomes a learned sequence of movements divorced from its original social and cultural context. A traditional dancer possesses not merely technical knowledge of step sequences, but embodied understanding of what dance expresses and reinforces.

The historical context of Greek traditional dance and music reveals remarkable continuity from ancient traditions, with rhythmic patterns maintaining connections to classical Greek musical systems. Greek traditional music preserves deep roots in ancient Greek musical frameworks and demonstrates direct relationships with Byzantine ecclesiastical music and the folk music of neighboring Eastern peoples.⁷ The mathematical relationships of acoustic intervals established by Pythagoras and the Pythagoreans provided foundational principles that influenced subsequent Byzantine, Arab, and Persian musical developments. Each culture then developed distinct idioms while adhering to these fundamental structural parameters. Archaeological and textual evidence suggests that circular dance formations, fundamental to Greek traditional practice, existed in Crete from Minoan times.

⁶ Alkis Raftis. *“Ο Κόσμος του Ελληνικού Χορού”*. (Athens: Polytypo, 1985).

⁷ Vasiliki K. Tyronola, *Ο Ελληνικός Χορός: Μια διαφορετική προσέγγιση* (Athens: Gutenberg, 2001).

They were often performed around altars, sacred trees, or other ritual objects, primarily by priestesses, reflecting the predominant female deities of that era. The formation of the independent Greek state in 1832 marked a significant turning point for traditional culture, introducing modern administrative structures that disrupted established community-based cultural transmission mechanisms and transformed education from local community control to state oversight.⁸

The contemporary cultural crisis facing traditional Greek communities adds urgency to this research endeavor. The transformation of Greece from a predominantly rural, traditional society to a modern, urbanized nation has fundamentally altered the social conditions that sustained all those traditional cultural practices. Young people increasingly migrate to urban centers, breaking the intergenerational chains of cultural transmission that preserved traditional knowledge for centuries. The elderly informants who possess authentic knowledge represent a diminishing resource whose passing will result in irreversible cultural loss.

Previous ethnographic research has relied primarily on fieldwork methodology, utilizing oral history and extensive interviews with mostly elderly informants who, as stated before, possess direct experience of traditional practices. These established approaches, while invaluable, sometimes face limitations in capturing the precise kinetic details and temporal nuances that define authentic traditional performance. Traditional ethnographic methods excel at documenting cultural contexts, social meanings, and historical narratives, but struggle to preserve the subtle movement qualities, spatial relationships, and rhythmic variations that distinguish regional styles and individual interpretations. Written descriptions of dance, no matter how detailed, cannot capture the three-dimensional complexity of human movement or the temporal flow that gives dance its distinctive character.

⁸ Nikolaos G. Vavritsas, *Παραδοσιακοί χοροί και η διδασκαλία τους: ρυθμοκινητική ανάλυση και ρυθμική αρίθμηση* (Thessaloniki: Vavritsas Nikolaos, 2018).

The present study introduces motion capture technology as an innovative documentation and teaching tool, offering unprecedented precision in recording movement patterns and spatial relationships. This technological approach enables detailed data analysis of captured movement sequences. It facilitates morphological examination of dance structures from basic kinetic elements through complete choreographic compositions. Motion capture technology can document micro-movements, weight shifts, and subtle gestural qualities that escape conventional observation while providing quantitative data that enables systematic analysis.

This interdisciplinary approach recognizes that traditional dance exists simultaneously as a kinetic phenomenon, social practice, historical document, and cultural expression. The research methodology, therefore, combines anthropological insight, historical analysis, technological innovation, and cultural preservation to address the complex challenges of documenting and understanding traditional cultural practices in contemporary contexts. Through this comprehensive approach, the investigation aims not only to contribute to academic knowledge but also to the ongoing vitality of Greek traditional culture itself.

Historical Context. Crete, Pontus, and Epirus: Integration of the Three Regions within Their Historical Framework during the Byzantine Era and Examination of Their Interactions

Crete, in its strategic position within the central-eastern Mediterranean basin, has historically experienced repeated conquests and profound cultural transformations. One of the most significant and turbulent periods in its history was the Arab occupation, known in historical sources as the Saracen period (9th-10th century AD). Saracen pirates, who were predominantly from the Iberian Peninsula and North Africa, occupied the island and established their hegemonic authority.

Despite the occupation lasting approximately 134 years⁹, this period was insufficient to fundamentally alter the ethnological composition and linguistic continuity of the indigenous Cretan population. Following a series of unsuccessful military endeavors by the Byzantine Empire, the strategic military campaign orchestrated by General and subsequent Emperor Nikephoros Phokas in 960-961 AD¹⁰ culminated in the reintegration of the island into Byzantine territorial sovereignty.

This chapter aims to undertake a systematic examination of the pivotal historical developments that characterized this period. Additionally, it aims to elucidate how the Byzantine reconquest of Crete, accompanied by systematic demographic redistribution from various imperial regions, influenced the subsequent evolution of local customs, traditions, and cultural practices. Through rigorous analysis of these historical phenomena, we shall attempt to construct a theoretical framework for interpreting contemporary cultural manifestations, with particular emphasis on traditional choreographic practices, in comparative relation to analogous expressions in other geographical regions within the Hellenic territorial domain.

1.1 Arab Rule in Crete: Conquest and Administration

1.1.1 The Saracens in Crete

The Arab conquest of Crete is known to have begun definitively in the period 824-827¹¹ AD, when pirates predominantly from Spain, characterized by a heterogeneous ethnocultural composition and minimal religious institutionalization, successfully subjugated the island and established dominion over the Indigenous population. Byzantine historiographical sources typically designate these invaders

⁹ Taxiarchis G. Kolias. *“Νικηφόρος [Β'] Φωκάς (963–969): Ο Στρατηγός Αυτοκράτωρ και το Μεταρρυθμιστικό του Έργο”*. (Athens: Istorikes Ekdoseis St. D. Vasilopoulos, 1993).

¹⁰ Ibid., pp 95-99

¹¹ Vasilis I. Kalaitzakis. *“Η Κρήτη και οι Σαρακηνοί”*. (Athens: Rontas, 1984), pp 25.

as Saracens, Mozarabs, or, following their territorial establishment, simply as Cretans. However, extant historical documentation indicates that the Arab inhabitants of Crete maintained negligible diplomatic relations with the eastern or North African caliphates and demonstrated minimal interest in the imposition of Islamic religious practices, linguistic systems, or cultural paradigms upon the autochthonous population¹². This phenomenon is partially attributable to the diverse religious backgrounds of the conquerors themselves, many of whom were recent converts to Islam or even adherents to Christianity.¹³

1.1.2 Character of the Arab Occupation

The establishment of Arab hegemony in Crete did not manifest as a systematically organized or theologically orthodox expansion of Islamic influence¹⁴. Rather, it represented a consequential outcome of disintegrative sociopolitical phenomena, internecine conflicts, and socioeconomic instability within Arab territories¹⁵. The structural diffuseness of this occupation is evidenced by the general absence of methodical initiatives toward the Arabization or Islamization of the indigenous population.¹⁶ A particularly illustrative indication of the religious heterodoxy characteristic of these Arab settlers and their limited integration within the broader Islamic ecumene is their documented consumption of wine, a practice explicitly proscribed by orthodox Islamic doctrine.¹⁷ Nevertheless, some demographic modification of the native population inevitably occurred, primarily through matrimonial alliances between Arab conquerors and indigenous Cretan women.¹⁸

¹² Loukia Panagi. *“Η ανακατάληψη της Κρήτης από το Νικηφόρο Φωκά (961)”*. (Master's thesis, Aristotle University of Thessaloniki, 2009), pp 77-78

¹³ Vasilis I. Kalaitzakis. *“Η Κρήτη και οι Σαρακηνοί”*. (Athens: Rontas, 1984)

¹⁴ Ibid.

¹⁵ Ibid. pp 30.

¹⁶ Ibid.

¹⁷ Loukia Panagi. *“Η ανακατάληψη της Κρήτης από το Νικηφόρο Φωκά (961)”*. (Master's thesis, Aristotle University of Thessaloniki, 2009).

¹⁸ Vasilis I. Kalaitzakis. *“Η Κρήτη και οι Σαρακηνοί”*. (Athens: Rontas, 1984).

However, Arab domination exerted a catalytic influence on the military and commercial security paradigms of the island¹⁹. The Saracens employed Crete as a strategic base for maritime predation, significantly disrupting commercial navigation throughout the Aegean region. The Byzantine imperial administration recognized the substantial geopolitical implications of this situation and initiated multiple military campaigns aimed at reclaiming the island.²⁰ However, these endeavors, until the significant expedition of 949 (or, according to alternative chronological interpretations, 956), uniformly failed²¹, simultaneously diminishing Byzantine strategic confidence and further facilitating the expansive maritime activities of the Saracen forces.²²

1.1.3 Preservation of Greek Identity

Despite the protracted Arab occupation, which lasted for 134 years²³, the Cretan population maintained its Hellenic character. There were no significant alterations to its linguistic structures or cultural traditions.²⁴ Kalaitzakis²⁵ emphasizes the absence of systematic Islamization initiatives or deliberate modifications to Indigenous customs and traditions by the Arab authorities. Comprehensive anthropological and linguistic analyses, exemplified by Aris Poulianos' seminal work "The Origin of Cretans"²⁶ corroborate that the Cretan populace has maintained indigenous continuity within the Aegean basin since the Mesolithic Era, experiencing negligible alterations in its racial or ethnological composition during

¹⁹ T. Georgios Tserebelakis. "*Ο Νικηφόρος Φωκάς και η Απελευθέρωση της Κρήτης από τους Άραβες*". (Athens: Ekdotikos Oikos Stamouli, 2009), pp 142-146.

²⁰ Vasilis I. Kalaitzakis. "*Η Κρήτη και οι Σαρακηνοί*". (Athens: Rontas, 1984), pp 86.

²¹ Loukia Panagi. "*Η ανακατάληψη της Κρήτης από το Νικηφόρο Φωκά (961)*". (Master's thesis, Aristotle University of Thessaloniki, 2009).

²² Gustave Leon Schlumberger. "*Ο Αυτοκράτωρ Νικηφόρος Φωκάς*". (Athens: Typois P. D. Sakellariou, 1905).

²³ Taxiarchis G. Kolias. "*Νικηφόρος [Β'] Φωκάς (963–969): Ο Στρατηγός Αυτοκράτωρ και το Μεταρρυθμιστικό του Έργο*". (Athens: Istorikes Ekdoseis St. D. Vasilopoulos, 1993).

²⁴ Nikolaos V. Tomadakis. "*Προβλήματα της εν Κρήτη Αραβοκρατίας 826-961 μ.Χ. περί της δήθεν αλλοιώσεως του πληθυσμού εξ απόψεως εθνολογικής και θρησκευτικής*". (Athens, 1960).

²⁵ Vasilis I. Kalaitzakis. "*Η Κρήτη και οι Σαρακηνοί*". (Athens: Rontas, 1984).

²⁶ Aris Poulianos. "*Η καταγωγή των Κρητών*". (Athens: Anthropologiki Etaireia, 2004).

the Arab occupation²⁷. The observed variations in physical characteristics between Western and Eastern Cretan populations can be traced back to the fundamental Aegean anthropological type, which has characterized the island's demographic profile to a limited extent since the Mesolithic period. Over the course of approximately four millennia, the Cretan population has demonstrated remarkable anthropological continuity, with the contemporary Cretan anthropological typology already becoming established during the Middle Minoan period. Poulianos' anthropological research conclusively demonstrates that even the Minoan dynastic lineage was of indigenous origin, with Greek serving as its linguistic medium. A marginal differentiation, manifested as a lighter pigmentation within the predominantly darker Cretan phenotype, represents an influence from Indo-European linguistic groups, potentially Greek, circa 2000 BC.²⁸

This anthropological continuity acquires particular significance in the analytical examination of the island's cultural and choreographic traditions. Any methodological inquiry into the potential influence of Arab culture on indigenous customs, traditional musicological and choreographic practices, ethical norms, or cultural traditions must acknowledge the historical evidence of conscious Cretan resistance against profound cultural assimilation by Arab conquerors, coupled with the aforementioned Arab disinterest in imposing linguistic or cultural homogeneity. The indigenous Cretan populations inhabiting mountainous regions were the ones that predominantly maintained their Christian religious identity²⁹, while a subset of those who, under various socio-political pressures, nominally converted to Islam continued clandestine adherence to Christian practices as crypto-Christians.³⁰

²⁷ Ibid., pp 200-202.

²⁸ Ibid.

²⁹ Ibid., pp 200.

³⁰ Nikolaos V. Tomadakis. *“Προβλήματα της εν Κρήτη Αραβοκρατίας 826-961 μ.Χ. περί της δόθεν αλλοιώσεως του πληθυσμού εξ απόψεως εθνολογικής και θρησκευτικής”*. (Athens, 1960).

1.2 The Byzantine Campaign of 960–961

1.2.1 Preparation of the Campaign

The Byzantine Empire found itself in a precarious geopolitical position in Crete during the period of Arab hegemony due to persistent maritime predatory activities. The imperial administration initiated numerous military endeavors to reclaim the island³¹; however, these attempts invariably proved ineffectual. The final significant unsuccessful expedition in 949 AD³² -although some claim it took place in 956, as mentioned above- further exacerbated the psychological resilience of Byzantine military leadership³³.

However, a significant turning point emerged with the ascension of Emperor Romanos II (959–963 AD) and the strategic recommendations of General Joseph Bringas for a renewed military campaign under the leadership of the Domestic of the Schools³⁴ Nikephoros Phokas³⁵. Phokas, hailing from an aristocratic Cappadocian lineage, specifically from the ancient and distinguished clan of the Phokades³⁶, had previously exhibited exceptional military acumen in confrontations against Arab forces along the eastern imperial frontiers³⁷.

1.2.2 The Force of the Campaign

Nikephoros Phokas was instrumental in the assembly of one of the most extensive and technologically sophisticated Byzantine naval fleets to date, comprising,

³¹ Vasilis I. Kalaitzakis. *“Η Κρήτη και οι Σαρακηνοί”*. (Athens: Rontas, 1984), pp 50-85.

³² Ibid., pp 86.

³³ Loukia Panagi. *“Η ανακατάληψη της Κρήτης από το Νικηφόρο Φωκά (961)”*. (Master's thesis, Aristotle University of Thessaloniki, 2009).

³⁴ Nikolay Kanev. *“Byzantine Rank Hierarchy in the 9th – 11th Centuries,”* Studia Ceranea: Journal of the Waldemar Ceran Research Centre for the History and Culture of the Mediterranean Area and South-East Europe 8 (2018).

³⁵ T. Georgios Tserebelakis. *“Ο Νικηφόρος Φωκάς και η Απελευθέρωση της Κρήτης από τους Άραβες”*. (Athens: Ekdotikos Oikos Stamouli, 2009), pp 25 - 31

³⁶ Plural of Phokas. It is referred to the House of Phokades (9th-11th century). Appearance and rise of the family are placed during the Macedonian dynasty.

³⁷ Vasilis I. Kalaitzakis. *“Η Κρήτη και οι Σαρακηνοί”*. (Athens: Rontas, 1984).

according to Schlumberger's quantitative assessment, 3,307 maritime vessels³⁸. This armada included 2,000 “chelandia”, specialized warships equipped with the proprietary Byzantine incendiary weapon known as Greek fire and manned by numerous oarsmen, supplemented by 1,000 “dromones” (transport vessels designed for the conveyance of cavalry and infantry) and 300 “kamatera” designated for provisions, siege apparatus, and logistical supplies³⁹.

The terrestrial military component was constituted of strategic units from the themes of Thrace and Macedonia (collectively designated as the European themes), augmented by contingents from the eastern (Asian) themes. The multinational composition of the expedition is evidenced by the inclusion of Russian, Slavic, Armenian, and other mercenary elements integrated into the Byzantine military structure⁴⁰.

1.2.3 Journey to Crete

It is evident⁴¹ that the Byzantine expeditionary forces departed from Constantinople in late June or early July 960 AD⁴². Prior to embarkation, the customary religious ceremonial was conducted at the imperial port of Boukoleon, with the ceremonial presence of the Emperor and the Ecumenical Patriarch. Thereafter, the naval armada proceeded towards Phygela⁴³ in Asia Minor (situated meridionally to Ephesus) to incorporate additional military units⁴⁴ from the Asian themes⁴⁵.

³⁸ Gustave Leon Schlumberger and Ioannis M. Chatzifotis. *“Ο Αυτοκράτωρ Νικηφόρος Φωκάς και η Βυζαντινή εποποιΐα, κατά τα τέλη της Ι' εκατονταετίας”*. (Athens: Grigoriadis, 1977).

³⁹ Vasilis I. Kalaitzakis, *“Η Κρήτη και οι Σαρακηνοί”*. (Athens: Rontas, 1984), pp 93-94.

⁴⁰ Ibid., pp 94-95.

⁴¹ Loukia Panagi. *“Η ανακατάληψη της Κρήτης από το Νικηφόρο Φωκά (961)”*. (Master's thesis, Aristotle University of Thessaloniki, 2009), pp 39-41

⁴² Ibid., pp 95.

⁴³ Ibid.

⁴⁴ Ibid.

⁴⁵ Grigorios Konstantinou Pitsikakis. *“Η απελευθέρωση της Κρήτης από τον Νικηφόρο Φωκά και η αποκατάσταση του Εκκλησιαστικού Οργανισμού”*. (Master's thesis, Aristotle University of Thessaloniki, 2024)

From this point of consolidation, swift ships were sent as reconnaissance elements to assess strategic conditions in northern Crete⁴⁶, reporting that the island's emir, Abd al-'Aziz ben 'Umar ben Shu'ayb II al-Kotorbi⁴⁷, and prominent Saracen authorities in Heraklion were demonstrating a lack of strategic preparedness while holidaying in their rural estates. Subsequent to the acquisition of this intelligence, Phokas issued a directive for the fleet to navigate toward Crete, traversing insular territories such as Naxos and Thera, ultimately arriving at the islet of Dia, situated opposite Chandax, in late July⁴⁸.

1.3 The Capture of Chandax and the Consequences of the Reconquest

1.3.1 Capture and Cleansing Operations

The military circumvallation of Chandax⁴⁹ (known today as Heraklion) lasted for approximately eight months⁵⁰. On 7 March 961 AD⁵¹, Byzantine forces breached the defensive fortifications of the fortified metropolis, thus signifying the commencement of the definitive expulsion of Arab elements from the insular territory⁵². Following the metropolitan capitulation⁵³, Phokas methodically executed purification operations in additional Cretan regions, thereby achieving the primary strategic objective of the campaign⁵⁴.

⁴⁶ Ibid., pp 57-58.

⁴⁷ The name of the last emir of Crete, as found in Arabic historical sources. For further information see also: Vasilis I. Kalaitzakis, *“Η Κρήτη και οι Σαρακηνοί”*, pp 96.

⁴⁸ Vasilis I. Kalaitzakis. *“Η Κρήτη και οι Σαρακηνοί”*, pp 56-57.

⁴⁹ T. Georgios Tserebelakis. *“Ο Νικηφόρος Φωκάς και η Απελευθέρωση της Κρήτης από τους Άραβες”*. (Athens: Ekdotikos Oikos Stamouli, 2009), pp 34.

⁵⁰ Loukia Panagi. *“Η ανακατάληψη της Κρήτης από το Νικηφόρο Φωκά (961)”*. (Master's thesis, Aristotle University of Thessaloniki, 2009), pp 46-57

⁵¹ Vasilis I. Kalaitzakis. *“Η Κρήτη και οι Σαρακηνοί”*. (Athens: Rontas, 1984, pp 117

⁵² Stefanos A. Xanthoudidis. *“Επίτομος Ιστορία της Κρήτης”*. (Athens: Elliniki Ekdotiki Etaireia, 1909), pp 70-73

⁵³ Grigorios Konstantinou Pitsikakis. *“Η απελευθέρωση της Κρήτης από τον Νικηφόρο Φωκά και η αποκατάσταση του Εκκλησιαστικού Οργανισμού”*. (Master's thesis, Aristotle University of Thessaloniki, 2024), pp 60-74

⁵⁴ T. Georgios Tserebelakis. *“Ο Νικηφόρος Φωκάς και η Απελευθέρωση της Κρήτης από τους Άραβες”*. (Athens: Ekdotikos Oikos Stamouli, 2009), pp 36 – 41.

1.3.2 Resettlement of Populations & Strengthening of the Christian Element

As previously discussed, the national identity and ethnological characteristics of the Cretan population were not severely destroyed but underwent a process of partial modification during the prolonged Arab occupation⁵⁵. In order to strengthen and revitalize the Hellenic and Christian demographic component of the island, Phokas systematically implemented population transfers from alternative Byzantine provincial territories, specifically from the eastern themes of the empire. Historical sources⁵⁶ also document his establishment of new “γένη” (génē = aristocratic familial lineages) on the island with a view to fortifying the governing echelon⁵⁷. However, this interpretation is likely to be a misattribution of historical elements rather than an accurate reflection of historical actuality⁵⁸.

Methodologically, it is important to note that my current bibliographic research does not allow for a categorical assertion regarding the exclusively Pontic origin of the populations that were relocated. However, evidence has been found⁵⁹ which indicates the occurrence of population transfers from the themes of Pontus. In addition, there are isolated instances of Pontic individuals being transferred to Crete following the decisive victory over the Arab forces, with the aim of contributing to the expulsion of any Arab elements that had been assimilated into the indigenous population during the period of Arab governance. A paradigmatic exemplification of such Pontic-origin individuals is Saint Nikon “ho Metanoieite”, whom we will discuss in greater depth in the subsequent chapter.

This strategic policy of demographic reconfiguration was directly correlated with the Byzantine administrative imperative to transform Crete into a formidable imperial bulwark in the Mediterranean region. Following the reconquest, the island

⁵⁵ Vasilis I. Kalaitzakis. *“Η Κρήτη και οι Σαρακηνοί”*. (Athens: Rontas, 1984), pp 195-197

⁵⁶ Stefanos A. Xanthoudidis. *“Επίτομος Ιστορία της Κρήτης”*. (Athens: Elliniki Ekdotiki Etaireia, 1909), pp 75-77

⁵⁷ Nikolaos V. Tomadakis. *“Προβλήματα της εν Κρήτη Αραβοκρατίας 826-961 μ.Χ. περί της δήθεν αλλοιώσεως του πληθυσμού εξ απόψεως εθνολογικής και θρησκευτικής”*. (Athens, 1960).

⁵⁸ Vasilis I. Kalaitzakis. *“Η Κρήτη και οι Σαρακηνοί”*. (Athens: Rontas, 1984), pp 168, 197-198

⁵⁹ Alexios G. K. Savvidis. *“Ο Βυζαντινός Πόντος (4ος – 15ος αιώνας μ.Χ.). Ιστορικές Συμβολές”*. Athens, 2013, pp 18-32

was re-established under thematic administrative structures, maintaining close connectivity with the Byzantine central authority and acquiring the requisite military and administrative infrastructural elements to prevent analogous future vulnerabilities⁶⁰.

1.4 Ecclesiastical Reorganization and Missionary Activity

1.4.1 The Role of Nikephoros Phokas

Nikephoros Phokas demonstrated exceptional diligence in addressing the distinctive ecclesiastical and theological complexities confronting Crete following the island's liberation in 961 AD⁶¹. In pursuit of the seamless integration of the Cretan population into the Byzantine imperial structure, he prioritized the resolution of their Christianization process. Recognizing that, since the iconoclastic period, the ecclesiastical establishment in Crete had functioned without adequate spiritual governance and had experienced marginal influence from the occupying forces, Nikephoros Phokas solicited assistance from various monastic centers, requisitioning clerical authorities to disseminate orthodox theological doctrines and facilitate spiritual revitalization.

During the military circumvallation of Chandax⁶², Nikephoros extended invitations to prominent monastic figures and hierarchs to contribute to the resolution of specific ecclesiastical matters and reinforce the orthodox faith. Saint Athanasius the Athonite was among these ecclesiastical authorities and conducted a visitation to Phokas at the Byzantine encampment. Following the successful military outcome, additional significant clerical and scholarly figures were solicited⁶³. The

⁶⁰ Vasilis I. Kalaitzakis. *“Η Κρήτη και οι Σαρακηνοί”*. (Athens: Rontas, 1984), pp 199-202

⁶¹ Ibid., pp 117

⁶² Loukia Panagi. *“Η ανακατάληψη της Κρήτης από το Νικηφόρο Φωκά (961)”* (Master's thesis, Aristotle University of Thessaloniki, 2009), pp 46-52

⁶³ Alexios G. K. Savvidis. *“Ο Βυζαντινός Πόντος (4^{ος} – 15^{ος} αιώνας μ.Χ.). Ιστορικές Συμβολές”*. Athens, 2013, pp 120.

“Typikon” of the Great Lavra⁶⁴ preserves a narrative attributed to Athanasius the Athonite, in which he describes how Nikephoros encountered him at Mount Kyminas and disclosed his monastic aspirations. According to this account, Emperors Constantine and Romanos repudiated this vocational inclination, unwilling to forfeit the services of a youthful and proficient military commander. The fundamental historiographical question concerning Nikephoros's spiritual trajectory pertains to the temporal point at which he ultimately relinquished this monastic aspiration. Evidential documentation suggests that in 961 AD, during his encounter with Athanasius⁶⁵ in Crete, he maintained a resolute commitment to monastic vocation, reiterating his intention to abdicate secular authority and proffering financial resources for monastic construction. The hagiographical narrative of Saint Athanasius indicates that the Saint had assumed the role of spiritual guide to Nikephoros Phokas, a relationship that, while potentially representing a later traditional construction, nevertheless encapsulates the essential nature of their ecclesiastical association.

1.4.2 Saint Nikon “ho Metanoeite” (“*you should repent*”)

The most distinguished ecclesiastical authority participating in the spiritual revitalization of Crete was Saint Nikon “ho Metanoeite”⁶⁶, whose epithetical designation eloquently encapsulates his dynamic catechetical methodology⁶⁷. In order to comprehensively evaluate the contributions of this significant ascetic figure, it is methodologically essential to contextualize his activities within the framework of Arab dominance previously delineated. Constantine Akropolites (13th century AD), in his “Discourse on Saint Barbaros”⁶⁸ documents that numerous

⁶⁴ Grigorios Konstantinou Pitsikakis. “*Η απελευθέρωση της Κρήτης από τον Νικηφόρο Φωκά και η αποκατάσταση του Εκκλησιαστικού Οργανισμού*” (Master’s thesis, Aristotle University of Thessaloniki, 2024), pp 96.

⁶⁵ Vasilis I. Kalaitzakis. “*Η Κρήτη και οι Σαρακηνοί*” (Athens: Rontas, 1984), pp 122.

⁶⁶ [Dumbarton & Oaks Hagiography Database](#).

⁶⁷ Vasilis I. Kalaitzakis. “*Η Κρήτη και οι Σαρακηνοί*” (Athens: Rontas, 1984), pp 171.

⁶⁸ Ilias Taxidis. “*A Pirate in Aitolia: The Logos of Constantine Akropolites on St Barbaros*”. (Thessaloniki: 2022), 413-445.

inhabitants of Crete and Sicily, while nominally converting to Islam during Arab occupation, clandestinely preserved their Christian religious identity⁶⁹.

Hagiographical sources⁷⁰ present minor chronological discrepancies regarding his biographical timeline: his nativity in Pontus has been positioned in circa 930–935 AD⁷¹ and his demise in Sparta approximately 998 AD⁷²; while alternatively his birthplace has been located in Asia Minor (Eastern Pontus) around 920–925 AD⁷³. Regardless of these variances, he originated from a distinguished familial lineage and from his early already developmental phase, embraced a monastic vocation. His initial ascetic practice occurred at the monastery of Chryse Petra, situated at the territorial juncture of Pontus and Paphlagonia, where he maintained residency for approximately twelve years. Subsequently, he traversed throughout Anatolia, in regions designated as the “eastern territories,” disseminating the theological message of repentance⁷⁴.

Following the liberation of Crete by Nikephoros Phokas in 961 AD, Saint Nikon undertook a missionary expedition to the island⁷⁵. While some testimonies suggest an invitation from the imperial court, it is more probable that Saint Nikon was responding to the general ecclesiastical appeal propagated by Phokas to various monastic establishments. Although there was no matter of complete cessation of ecclesiastical functionality, corruption, and moral laxity were pervasive, as numerous indigenous inhabitants had been temporally influenced by the customs of the occupying forces. The hagiographer's account indicates that Saint Nikon, having traversed several eastern regions, resolved to travel to Crete, which had

⁶⁹ Konstantinos Paparrigopoulos. *“Η ιστορία του Ελληνικού έθνους από των αρχαιοτάτων χρόνων μέχρι το 1930”*. (Athens: Eleftheroudakis, 1932), pp 235-240.

⁷⁰ Dumbarton & Oaks Hagiography Database, pp 78.

⁷¹ Meletios Evangelos Giannopoulos. *“Βίος, Πολιτεία, Εικονογραφία Θαύματα και Ασματική Ακολουθία του Οσίου και Θεοφόρου Πατρός ημών Νικοδώμου του “Μετανοείτε”*. (Athina: Ekdoseis Papanikolaou, 1933), pp 31.

⁷² Dumbarton & Oaks Hagiography Database, pp 78.

⁷³ Grigorios Konstantinou Pitsikakis. *“Η απελευθέρωση της Κρήτης από τον Νικηφόρο Φωκά και η αποκατάσταση του Εκκλησιαστικού Οργανισμού”* (Master's thesis, Aristotle University of Thessaloniki, 2024), pp 97-100.

⁷⁴ *Ibid.*, pp 96-100.

⁷⁵ Vasilis I. Kalaitzakis *“Η Κρήτη και οι Σαρακηνοί”* (Athens: Rontas, 1984), pp 171.

recently liberated itself from Arab subjugation. Arriving presumably in 961 AD⁷⁶, he established his primary missionary activity in Gortyna and, over a period of approximately seven years, conducted extensive insular travels, propagating Christian doctrine, moral reformation, and reversion to Orthodox theological foundations. The profound impact of his evangelism led to the veneration of Saint Nikon by the Cretan populace, who regarded him as a “second Paul” – a reference to the Apostle Paul – due to the revitalization of Cretan theological conviction that he is said to have engendered⁷⁷.

Circa 970 AD, the Saint relocated to central and southern Greece, ultimately establishing residency in Sparta, where he founded a monastic institution and remained until his demise in the late 10th or early 11th century.

While the precise nature of his relationship with Nikephoros Phokas cannot be confirmed in exhaustive detail, it is historically certain that Saint Nikon constituted a central figure in the spiritual and religious renaissance of Crete⁷⁸. His primary objective was not the conversion of Cretans to the Christian faith but rather the reinforcement and renewal of Orthodox theological consciousness among communities that had long remained outside the complete jurisdiction of imperial and ecclesiastical governance. His efficacy was such that he collaborated with local administrative authorities for the Christianization of the Arabs remaining on the island, decisively contributing to the comprehensive effort of religious and social reformation initiated by Nikephoros Phokas⁷⁹.

⁷⁶ Grigorios Konstantinou Pitsikakis, *“Η απελευθέρωση της Κρήτης από τον Νικηφόρο Φωκά και η αποκατάσταση του Εκκλησιαστικού Οργανισμού”* (Master's thesis, Aristotle University of Thessaloniki, 2024), pp 97-100

⁷⁷ Vasilis I. Kalaitzakis. *“Η Κρήτη και οι Σαρακηνοί”* (Athens: Rontas, 1984), pp 171

⁷⁸ Alexios G. K. Savvidis. *“Ο Βυζαντινός Πόντος (4^{ος} – 15^{ος} αιώνας μ.Χ.). Ιστορικές Συμβολές”*. Athens, 2013, pp 120

⁷⁹ Konstantinos Paparrigopoulos. *“Η ιστορία του Ελληνικού έθνους από των αρχαιοτάτων χρόνων μέχρι το 1930”*. (Athens: Eleftheroudakis, 1932), pp 235-240

1.5 Population Movements in Later Years: The Relationship Between Crete and Pontus

The Empire of Trebizond⁸⁰ constituted a significant factor in preserving the Greek demographic element in the Black Sea region following the conquest of the Peloponnese by Mehmed II in 1458 AD, thus becoming the ultimate bastion of Byzantine Hellenism in Pontos Euxeinos⁸¹. However, when the Ottoman sultan redirected his military focus toward Trebizond, the imminent threat of urban capitulation became apparent. Despite the diplomatic efforts of Emperor David Komnenos, who sought military assistance from both Western and Eastern sovereigns, these efforts were unsuccessful. After a 32-day siege, Trebizond surrendered on 15 August 1461, marking the dissolution of the state of the Grand Komnenoi⁸² and the complete establishment of Ottoman hegemony in the region. The fall of Trebizond triggered a mass migration of Greeks from Pontus, with many seeking refuge in safer areas, including Crete. However, the connection between Crete and Pontus had already begun to take shape during the 14th and 15th centuries. A notable illustration of this phenomenon is provided by George of Trebizond (1395–1472 CE), a prominent intellectual figure of the era, who was born in Chandax to parents of Pontic origin and received his education under the protopresbyter of the city, John Symeonakis. This biographical detail attests to the presence of familial units from the Trebizond region in Crete even prior to the ultimate dissolution of the Pontic Empire.

Following 1461 AD, the Ottoman authorities forcibly relocated numerous Trebizondian aristocrats and prominent figures, including the Doranites and the Kavasites, to various regions within their territorial jurisdiction. Some of these individuals appear to have been relocated to Crete, seeking protection and survival opportunities. This migration of Pontic refugees functioned as a complementary

⁸⁰ Christos S. Samoulidis. *“Ιστορία του ποντιακού ελληνισμού”* (Athens: Alkyon, [19—]), pp 7-132

⁸¹ Pontus Euxinus in Latin or Εύξυνος Πόντος in Greek is the Black Sea.

⁸² Plural of Komnenos. The clan of Komnenoi, 11th – 12th century

demographic element to earlier Pontic settlements in Crete, as discussed before, reinforcing the cultural and historical bonds between the two regions⁸³.

The historical context of the fall of Trebizond⁸⁴ and the general pattern of Ottoman territorial expansion provide a comprehensive explanation for these demographic movements. Pontic individuals who arrived on the island, either before or after 1461 AD, contributed to the cultural diversity of Crete by introducing their linguistic⁸⁵, customary, and traditional elements, which naturally continued to constitute components of their cultural identity in their new geographical context. A notable illustration of this phenomenon is provided by the figure of George of Trebizond⁸⁶, who emerged as a prominent intellectual figure of his era, thereby underscoring the impact that the intellectual production of Pontic individuals could exert, even from a distance from their original homeland⁸⁷.

The reciprocal relationship between Crete and Pontus, therefore, was not confined exclusively to demographic movements but was also reflected in the intellectual and cultural domains. Notwithstanding the political dissolution of the Empire of Trebizond, the Greek element continued to be preserved and cultivated. Pontic individuals frequently found refuge in Crete, contributing to the preservation and transmission of traditions, thereby enriching the historical and cultural landscape of the island⁸⁸.

A notable example of the connection between Crete and Pontus is documented in the case of February 1414 AD, when the leader of the Trebizondians, Ambrakios Anteron Armietos, petitioned the Venetian Senate to permit the settlement of 880 families from Trebizond in Crete. Consequently, a settlement was established near

⁸³ Christos S. Samoulidis. *“Ιστορία του ποντιακού ελληνισμού”*. (Athens: Alkyon, [19—]), pp 7-132.

⁸⁴ Georgios Grigoriadis. *“Ο Πόντος και το Κάρς: (ιστορία, λαογραφία και “ο Κορπακόρτς ο Πέτρον”): εντυπώσεις από επίσκεψη του 1972”*. (Athens: Typois Promitheus, 1973)

⁸⁵ Pontic Dialect. See, Sofronis Chatzisavvidis. *“Η ΠΟΝΤΙΑΚΗ ΔΙΑΛΕΚΤΟΣ: Η ΙΣΤΟΡΙΑ ΤΗΣ ΚΑΙ Η ΧΡΗΣΗ ΤΗΣ ΣΤΟΝ ΕΛΛΑΔΙΚΟ ΧΩΡΟ ΣΗΜΕΡΑ”*. (Thessaloniki: Aristotle University of Thessaloniki, 2012).

⁸⁶ John Monfasani. *“George of Trebizond”*. In: Lagerlund, H. (eds) *Encyclopedia of Medieval Philosophy* (New York: University of Albany, 2020), pp 607-610.

⁸⁷ Alexios G. K. Savvidis. *“Ο Βυζαντινός Πόντος (4^{ος} – 15^{ος} αιώνας μ.Χ.). Ιστορικές Συμβολές”*. Athens, 2013, pp 127-128.

⁸⁸ Christos, Giantamidis. *“Οι Ακατάλυπτοι Δεσμοί Ποντίων και Κρητικών”*. (Athens: Arxeion Politismou, 2020).

Siteia, which was designated as “Trapezunda”(Trebizond). Despite the town's destruction in 1648 AD, contemporary archaeological remains are present, including a depiction of the single-headed eagle of the Komnenoi of Trebizond⁸⁹, suggesting the potent symbolism of the inhabitants' origin. Furthermore, toponyms such as Tsakonia, Maroula, Attipas, Argyroupoli, and Lithine may be etymologically connected to Pontic roots, thereby revealing the cultural influence established by the newly arrived Pontic individuals on the island⁹⁰.

Subsequent centuries also saw continued migrations from Pontus to Crete, motivated by security considerations, survival imperatives, or even support through participation in military conflicts. During the Greek Revolution of 1821, Pontic individuals fought alongside Cretans, a notable example being Alexis Mavrothalassitis, who was killed in battle and interred in Crete. Following the Asia Minor Catastrophe and the Pontic Genocide of 1922, a new wave of refugees arrived on the island, receiving support and hospitality from the Cretan population and establishing permanent residence⁹¹.

From a historical point of view, it is interesting to note that Giacomo Cornaro, progenitor of the poet Vitsentzos Cornaro, is documented as having resided in Cretan Trapezunda. A significant linguistic aspect that merits attention is the linguistic imprint discernible in “Erotokritos,” the literary composition of Vitsentzos Cornaro. Lexical elements present in the poem, such as: “krouzo,” “psellon,” “kintea,” “kompono,” “khalkoman,”⁹² among others, are not characteristic of the Cretan dialect but are instead derived from the Pontic dialectal tradition. This represents yet another illustration of the fruitful cultural osmosis between the two populations.

⁸⁹Christos S. Samoulidis. *“Ιστορία του ποντιακού ελληνισμού”*. ([Athens]: Alkyon, [19—]), pp 54.

⁹⁰ Christos, Giantamidis. *“Οι Ακατάλυπτοι Δεσμοί Ποντίων και Κρητικών”*. (Athens: Arxeion Politismou, 2020).

⁹¹ Ibid.

⁹² Ibid.

1.6 Middle Byzantine Epirus (7th–12th Century AD): Historical Elements, Arab Raids, Relations with the Empire

The period spanning from the 7th to the 8th century is often referred to as the 'dark ages' for Epirus in historiographical discourse, a designation stemming from the dearth of extant written documentation. Archaeological evidence, while providing indirect insights into the region's demographic and administrative status, is marred by its own fragmentary nature⁹³. This is further compounded by the extensive population movements of Avars and Slavs, as well as continuous raids, which have collectively rendered the task of formulating a coherent and comprehensive interpretation of developments during the early Middle Byzantine period particularly challenging. Nevertheless, the scant evidence – both in ecclesiastical records and in architectural remains – confirms that Epirus was never completely outside Byzantine influence, despite the limited capacity of the central administration to supervise the western provinces closely⁹⁴.

1.6.1 Early Disturbances (7th – 8th Century)

The historical account of Epirus during the 7th century is marked by recurrent raids perpetrated by Avar and Slavic populations, which systematically destabilized urban centers and ecclesiastical institutions, precipitating demographic displacements of the autochthonous population⁹⁵. Empirical evidence documenting the translocation of sacred relics – such as those of Saint Donatus to Cephalonia – corroborates the pervasive atmosphere of insecurity. The perceived threat was such that artifacts of particular cultural and spiritual significance to the region's inhabitants, including ecclesiastical and spiritual

⁹³ B. M. Sakelariou (ed). “*Ήπειρος: 4000 χρόνια ελληνικής ιστορίας και πολιτισμού*”. (Athens: Ekdotiki Athinon, 1997), pp 65-85

⁹⁴ Ibid., pp 76-77

⁹⁵ Ibid., pp 76-77, 79

heirlooms, were evacuated for preservational purposes⁹⁶. The geomorphological configuration of Epirus, with its extensive mountainous topography, combined with the inadequate transportation infrastructure connecting the region to Constantinople, significantly impeded the effective subjugation of the territory to centralized imperial control. Nevertheless, Epirus maintained a continuous, albeit fragmentary, presence in Byzantine historiographical sources, indicating its persistent integration within the sphere of Byzantine political influence⁹⁷.

1.6.2 Formation of Administrative Structures and Reorganization (8th – 10th Century AD)

Progressively, the Byzantine administrative apparatus sought to reorganize the western provincial territories through the implementation of the thematic system, of which the Theme of Nikopolis was an example⁹⁸. The Theme of Nikopolis⁹⁹, which incorporated regions of Aetolia and Acarnania, was frequently documented in relation to Epirus. The strategic objective of this administrative reconfiguration was to facilitate more systematic defensive capabilities and more stable administrative organization¹⁰⁰. This administrative reconfiguration is indicative of the central authority's endeavors to consolidate its presence in coastal regions, which were frequently vulnerable to maritime incursions, and in mountainous territories, where communication infrastructure remained rudimentary. Concomitantly, the ecclesiastical establishment played a pivotal role in fostering communal cohesion, with episcopal sees and monastic institutions providing a foundational network of spiritual governance¹⁰¹.

⁹⁶ Ibid., pp 76

⁹⁷ Ibid., pp 79

⁹⁸ Ibid., pp 82

⁹⁹ Johannes Karayannopoulos. "Die Entstehung der byzantinischen Themenordnung". Vol. 10 (München: Walter de Gruyter GmbH & Co KG, 2020)

¹⁰⁰ B. M. Sakelariou (ed). " *Ήπειρος: 4000 χρόνια ελληνικής ιστορίας και πολιτισμού*". (Athens: Ekdotiki Athinon, 1997), pp 75-85

¹⁰¹ Ibid., pp 70-75

1.6.3 The Arab Threat and Coastal Defense Needs

During the 9th and 10th centuries, the predominant external security challenge confronting Epirus was the intensified activity of Saracen pirates¹⁰². Although, unlike Crete, the territorial regions of Epirus were never subjected to systematic Arab occupation, they nevertheless experienced significant adverse effects from these incursions. Concurrent with the previously described Saracen piratical activities in the Aegean, their operational sphere expanded to encompass the Ionian Sea. These groups, utilizing conquered Crete and other Mediterranean territories as operational bases, conducted raids along the Ionian coastline, plundering coastal settlements and monastic establishments. The inability of the imperial administration to provide immediate military intervention intensified the perception of insecurity, compelling many inhabitants to seek refuge in mountainous regions¹⁰³. Nonetheless, the topography of the region offered a significant protective factor for the local population, with the elevated mountain ranges in the interior acting as a natural bulwark against coastal threats. The security challenges confronting the Theme of Nikopolis were not exclusively limited to Arab incursions; during this period, the region faced an additional threat emanating from northern Epirus, specifically the expansionist efforts of the Bulgarians¹⁰⁴. The recurrent raids conducted under the authority of Tsar Symeon¹⁰⁵ across the Greek themes of the Byzantine Empire placed these territories in a perpetual state of vulnerability, a situation that the Theme of Nikopolis, and consequently the Epirote population, was compelled to address. Despite the localized dangers, plundering activities, and incursions it encountered, the Theme of Nikopolis participated in 949 AD in one of the unsuccessful Byzantine campaigns to liberate Crete from Saracen control. Based on extant documentation of the expeditionary force composition, approximately 1,000 military personnel from the Theme of Nikopolis can be reliably estimated to have participated¹⁰⁶.

¹⁰² Ibid., pp 79, 81, 85

¹⁰³ Ibid., pp 79

¹⁰⁴ Ibid., pp 81

¹⁰⁵ Ibid., pp 82-83

¹⁰⁶ Ibid.

In order to prevent potential historiographical misinterpretations at this point, it is imperative to emphasize that the strategic interaction between Cretan and Epirote populations terminates at this juncture. While Epirote military contingents participated in the unsuccessful liberation attempt of Crete, they did not subsequently constitute a component of the population that relocated to Crete following its definitive recapture, as occurred with inhabitants from the eastern themes of the empire and the Pontic region.

1.6.4 The Reconstruction of the 11th – 12th Century

In the subsequent chronological phase, particularly following the gradual reconquest of Crete in 961 AD and the effective confrontation of Bulgarian incursions in the Balkan territories¹⁰⁷, the Byzantine Empire demonstrated enhanced military and administrative consolidation¹⁰⁸. Epirus, occupying a position as a western 'frontier', began to be incorporated with greater structural formality, benefiting from the reconstructive initiatives implemented under the Macedonian dynasty (10th – 11th century)¹⁰⁹. However, the region continued to experience incursions by Norman forces, who sought either territorial acquisitions or predatory expeditions from their Adriatic bases. During this century, the local aristocracy gained increased political influence, often leveraging their geographical remoteness from the central imperial authority. Despite this, ecclesiastical affiliations were maintained, with the metropolitan see of Nikopolis documented as participating in ecclesiastical conferences and synods of the era. This documentary evidence confirms that the region maintained its conceptual inclusion within the Byzantine political and cultural domain¹¹⁰.

¹⁰⁷ Ibid., pp 82-84

¹⁰⁸ Ibid., pp 81, 85, 88

¹⁰⁹ Ibid., pp 90

¹¹⁰ Ibid., pp 90 - 91,

1.6.5 From the Late Middle Byzantine Period to the Dawn of the Late Byzantine Period (Late 12th – Early 13th Century)

The political reconfiguration that followed the Fall of Constantinople to Crusader forces in 1204 AD fundamentally transformed the geopolitical landscape of the Greek territories¹¹¹. Epirus, under the leadership of Michael I Komnenos Doukas (c. 1205–1215 AD), emerged as an autonomous political entity, historically designated as the “Despotate of Epirus” (although as it is nicely pointed out in the volume *Epirus: 4000 Years of Greek History and Culture* this terminology represents an anachronistic characterization, as the term “despotate” appears earliest during the 14th century¹¹²). This political development demonstrates a propensity for relative autonomy, which had been fostered through its extended Middle Byzantine experience¹¹³. The geographical isolation of the region and the inability of the central imperial authority to effectively secure its territorial boundaries further reinforced this autonomist tendency. This historical phase represents the period during which Epirus underwent transformation into a significant political center¹¹⁴, capable of resisting the novel feudal and political structures that Latin rulers were implementing throughout former Byzantine territories.

The comprehensive historical trajectory of Epirus during the Middle Byzantine period¹¹⁵ (7th – 12th century) reflects the contradictions and distinctive characteristics of a region situated at a crucial frontier juncture of the Byzantine Empire. From the earliest centuries, recurrent raids and geographically inaccessible interior regions limited the immediacy of central imperial authority, while successive reforms of the thematic system progressively modified the administrative organization. The persistent Arab maritime threat and subsequent Bulgarian and Norman invasions reinforced the defensive orientation of the region. Nevertheless, Epirus remained within the Byzantine cultural and political core,

¹¹¹*Ibid.*, pp 85-97

¹¹²*Ibid.*, pp 85

¹¹³*Ibid.*, pp 90, 94 - 96

¹¹⁴*Ibid.*, pp 85-86

¹¹⁵*Ibid.*, pp 65-97

constituting a vital link between Constantinople and the Western European sphere. The emergence of the “Despotate of Epirus”¹¹⁶ following 1204 AD marked the transition to a new political configuration, in which this comparative advantage of partial autonomy evolved into an independent state entity¹¹⁷.

Taking into consideration the aforementioned historical evidence, one may postulate with reasonable empirical certainty that this partial autonomy and geographical isolation of the Epirote region must have exerted a significant influence on the cultural development of the territory. The highly restricted, perhaps even non-existent, sustained contact with distant, culturally diverse regions, must have functioned as an inhibitory factor to the substantial distortion, or more accurately, the differentiation of the customs, traditions, and cultural practices of the region. It is methodologically important to differentiate between “distortion” and “differentiation” at this point, as the former term implies a potentially negative connotation. The synthesis of diverse cultural traditions, however, constitutes a generative element and therefore should not be demonized or considered inherently detrimental.

Theoretical Background

Dance is conceptualized as a fundamental essence and constitutive element within Greek societal structures, as well as a medium and transmitter of cultural heritage. This serves as the foundational paradigm upon which this paper is constructed and from which it derives its intellectual impetus. A concise philosophical examination and analytical deconstruction of dance is, therefore, methodologically essential. This chapter undertakes such an analysis, tracing the historical development of dance through a concise historiographical review extending from classical antiquity to contemporary traditional Greek social formations.

¹¹⁶Ibid., pp 85

¹¹⁷ Ibid., pp 76 - 96

The current work seeks to address several critical research questions: What position did dance occupy within ancient Greek sociocultural structures? Did this position maintain consistency or undergo transformative processes in traditional Greek society? One of the most important, probably, questions that we will address is the following: What is the sociocultural significance of the “panegyri” (the Greek festival) within traditional societal frameworks, and what function does dance serve within these ceremonial contexts? What are the musicological characteristics that, in conjunction with lyrical elements, provide dance with its substantive integrity and comprehensive form? What external factors influence these musical traditions, and what reciprocal influence do they exert?

Additional research questions requiring critical examination include the conceptualization of the “exemplary dancer”, the methodological identification and demonstration of choreographic excellence, the investigative mechanisms employed within traditional societies for the preservation and intergenerational transmission of dance heritage, and the analytical differentiation between “traditional” and “folkloric” dance forms.

A systematic scholarly response to these research questions is necessary to establish dance as a legitimate source of ethnographic information and to comprehend its capacity to reveal substantive cultural elements that might otherwise remain inaccessible through conventional historiographical methodologies.

2.1 The Essence of Dance and its Origin

Dance –as proposed by the comprehensive analytical framework of Mavrovouniotis (1992)¹¹⁸ and also initially found in the work of Cowan (1990)¹¹⁹– transcends mere autonomous biological corporal movement. Instead, it is constituted as a “culturally constructed text” within which multidimensional social

¹¹⁸ Fotios Mavrovouniotis. “Alexandros Malkogeorgos, and Eirini Argyriadou, Ελληνικοί Χοροί”. (Thessaloniki: Ekdotiki Aiginou, 2006), pp 22-32.

¹¹⁹ Jane K. Cowan. “*Dance and the Body Politic in Northern Greece*”. (New Jersey: Princeton University Press, 1990).

significances and cultural codes are inscribed. The inherent anthropological predisposition to express emotional states¹²⁰ – joy, lamentation, or other affective conditions – through kinesiological vocabulary has been documented since antiquity, as extensively elaborated by Lykesas (1993)¹²¹ in his methodologically rigorous work “Greek Dances,” wherein he presents a comprehensive analysis of the historical evolution and philosophical foundation of choreographic traditions within the Greek territorial domain¹²².

As an experiential medium and expressive mechanism for collective perceptions, dance functions as a sophisticated form of non-verbal communication within social group frameworks, representing a multimodal semiotic system¹²³. The distinctive characteristics emerging from factors that function as cohesive elements for specific social groups – yet frequently remain inaccessible or incomprehensible to heterogeneous social formations – possess such potent symbolic capacity that they transmit, through codified corporeal movements, profound emotional states, social tendencies, and manifestations of collective solidarity¹²⁴.

In ancient Hellenic civilization¹²⁵, dance attracted serious philosophical consideration from prominent intellectual figures¹²⁶, including Plato, Aristotle, and Xenophon¹²⁷. These philosophers conceptualized rhythmic movement not merely as an expression of youthful vitality and exuberance but as a manifestation of cosmic harmony reflected in celestial orbital patterns. Dance was incorporated into their comprehensive cosmological frameworks. This philosophical conceptualization demonstrates a profound understanding of dance as an intersection between human microcosmic existence and macrocosmic order,

¹²⁰ Richard G. Kraus. “*Ιστορία του Χορού*”. (Athens: Nefeli, 1980), pp 19-25.

¹²¹ Giorgos Ch. Lykesas. “*Οι Ελληνικοί Χοροί: Ιστορική – Πολιτιστική – Κοινωνιολογική και Μουσικοκινητική θεώρηση*”. (Thessaloniki: University Studio Press, 1993), pp 24-45.

¹²² Richard G. Kraus. “*Ιστορία του Χορού*”. (Athens: Nefeli, 1980), pp 62-71.

¹²³ Nikos Zournatdzidis. “*Συμβολή στην έρευνα του Ποντιακού χορού: χορευτικές διαδικασίες και χοροί του πόντου*”. (Athens: Choreftikos Omilos Pontion “Serra”, 2025), pp 43-47

¹²⁴ Ibid.

¹²⁵ Fotios Mavrovouniotis, Alexandros Malkogeorgos, and Eirini Argyriadou. “*Ελληνικοί Χοροί*”. (Thessaloniki: Ekdotiki Aiginou, [2006]), pp 35-39

¹²⁶ Ilias S. Dimas. “*Ελληνικοί παραδοσιακοί χοροί*”. (Athens: Grafikes texnes Alekou Kalemi, 1993), pp 22.

¹²⁷ Giorgos Ch. Lykesas. “*Οι Ελληνικοί Χοροί: Ιστορική – Πολιτιστική – Κοινωνιολογική και Μουσικοκινητική θεώρηση*”. (Thessaloniki: University Studio Press, 1993), pp 5-7, 30-31

emphasizing its transhistorical significance as both cultural expression and metaphysical inquiry¹²⁸.

During the Homeric epoch, as evidenced within the epic narratives of the Iliad and Odyssey¹²⁹, dance and musical expression fulfilled crucial multifunctional roles in symposia and both public and private celebratory contexts. Concurrently, they served as primary mechanisms for psychological restoration and spiritual elevation following physically and cognitively demanding military engagements, providing frameworks for emotional release and catharsis. Their functionality extended beyond purely recreational dimensions, however¹³⁰. Conversely, they were conceptualized as fundamental methodologies for physical and intellectual cultivation¹³¹, contributing significantly to holistic individual development in accordance with the ancient Greek ideal of harmonious integration between physical prowess and intellectual virtue¹³². They were regarded as integral components in developing agility, dexterity, and rhythmic coordination, essential elements for cultivating the ideal of the “*kalós kagathós*”¹³³ citizen, the individual embodying the synthesis of external aesthetic excellence and internal ethical virtue.¹³⁴

Of particular ethnochoreological significance within the Greek tradition is the circular dance formation, which, particularly in regions such as Pontus¹³⁵, reflects profound social values and structures, functioning as a polysemiotic microcosmic analog of social organization¹³⁶. The examination of the Pontic choreographic tradition presents exceptional anthropological and ethnological interest, as within

¹²⁸ Ibid., pp 67-89.

¹²⁹ Ibid., pp 34-35.

¹³⁰ Alkis Raftis. “Ο Κόσμος του Ελληνικού Χορού”. (Athens: Polytypo, 1985), pp 22-27.

¹³¹ Fotios Mavrouniotis, Alexandros Malkogeorgos, and Eirini Argyriadou. “Ελληνικοί Χοροί”. (Thessaloniki: Ekdotiki Aiginou, [2006]), pp 35-39.

¹³² Giorgos Ch. Lykesas. “Οι Ελληνικοί Χοροί: Ιστορική – Πολιτιστική – Κοινωνιολογική και Μουσικοκινητική Θεώρηση”. (Thessaloniki: University Studio Press, 1993), pp 24-29.

¹³³ *kalós kagathós* (καλὸς κάγαθός) > *Kalokagathia* = It refers to the Greek ideal of physical and mental excellence. The combination of those two appears as the overall excellence (*arete*) of the person.

¹³⁴ Giorgos Ch. Lykesas. “Οι Ελληνικοί Χοροί: Ιστορική – Πολιτιστική – Κοινωνιολογική και Μουσικοκινητική Θεώρηση”. (Thessaloniki: University Studio Press, 1993), pp 30-35.

¹³⁵ Nikos Zournatzidis. “Συμβολή στην έρευνα του Ποντιακού χορού: χορευτικές διαδικασίες και χοροί του πόντου”. (Athens: Choreftikos Omilos Pontion “Serra”, 2025), pp 39-40.

¹³⁶ Alkis Raftis. “Ο Κόσμος του Ελληνικού Χορού”. (Athens: Polytypo, 1985), pp 38-42.

this geographical region, the function of the lead dancer exhibits remarkable distinctiveness: it maintains essential homology with every other participant in the dance circle. The lead dancer avoids individual improvisation, instead achieving complete harmonization with the movement patterns of the other participants and with the rhythmic structure provided by the musicians. Consequently, in contrast to other choreographic traditions within the Greek territorial domain, the Pontic circle achieves completion, with beginning and terminal points converging and merging, thereby symbolizing community cohesion and egalitarian principles among community members¹³⁷.

In this choreographic context, the circular spatial configuration, wherein the primary dancer maintains the organic connection with the final participant¹³⁸, musicians occupy the central position equidistant from all dancers, and each participant simultaneously observes and is observed by all others, symbolically embodies and physically manifests fundamental democratic principles, justice, and equitable participation in collective expression¹³⁹. This spatial configuration is not merely an arbitrary arrangement, but rather a conscious manifestation of profound social values that govern community structural organization and functional dynamics, reflecting a specific cultural worldview. Within this collective framework, each dancer, while adhering to common rhythmic patterns and group conventions, simultaneously preserves individual expression through personal stylistic elements and particular emotional manifestation, establishing a delicate equilibrium between individual expressive autonomy and collective participation¹⁴⁰.

The integration of dancers representing diverse age demographics and varying proficiency levels reflects the multidimensional nature of social existence and its evolutionary dynamics, demonstrating dance's function as an active vehicle for collective experience and intergenerational transmission of cultural patterns and social continuity. This intergenerational coexistence within the dance circle

¹³⁷ Nikos Zournatdzidis. “ Συμβολή στην έρευνα του Ποντιακού χορού: χορευτικές διαδικασίες και χοροί του πόντου” . (Athens: Choreftikos Omilos Pontion “Serra”, 2025), pp 39-47.

¹³⁸ Ibid., pp 46.

¹³⁹ Ibid., pp 39-47.

¹⁴⁰ Ibid., pp 41-42.

facilitates the transmission of choreographic tradition and associated value systems from senior to junior community members, ensuring cultural persistence and social cohesion¹⁴¹.

The historical and mythological establishment of dance within the Greek territorial domain is powerfully documented in traditions identifying Crete as the original locus of dance¹⁴². The extensive mythological tradition of the island, with emblematic references to Theseus's labyrinthine dance at Knossos -the renowned “geranos”- and to the martial dances performed by the Kouretes surrounding the infant Zeus in the Idaean Cave, reinforces the symbolic significance of Crete as an archetypal center of choreographic art, imbuing it with dimensions of sacrality and esoteric significance¹⁴³.

Concerning the evolution of form, extant Greek documentary sources¹⁴⁴ – encompassing epigraphic inscriptions, ceramic iconography, and marble votive relief sculptures¹⁴⁵ – substantiate the existence of circular and ritualistic dances, with the paradigmatic example of the *syrtos*¹⁴⁶, preserved in numerous contemporary regional variations, providing evidence for the uninterrupted cultural continuity of Greek choreographic tradition across centuries. Archaeological investigations have unearthed a plethora of choreographic representations on vessels, murals, and sculptures, providing invaluable evidence concerning choreographic form and function in antiquity¹⁴⁷.

¹⁴¹ Alkis Raftis. “Ο Κόσμος του Ελληνικού Χορού”. (Athens: Polytypo, 1985), pp 38-42.

¹⁴² Marigoula Kritsioti. “Χορός και Προφορική Ιστορία”. In *Χορός και Ιστορία* (Aridaia: Diethnis Organosi Laikis Technis, 2000), pp 112-118.

¹⁴³ Ibid.

¹⁴⁴ Giorgos Ch. Lykesas. “Οι Ελληνικοί Χοροί: Ιστορική – Πολιτιστική – Κοινωνιολογική και Μουσικοκινητική Θεώρηση”. (Thessaloniki: University Studio Press, 1993), pp 5-30.

¹⁴⁵ Carolyn Laferrière. “Dancing with Greek Vases: Communicating through Sight, Movement, and Material.” *Greek and Roman Musical Studies* 9, no. 1 (Special issue. Netherlands: Brill, 2021), pp 85–114.

¹⁴⁶ Marigoula Kritsioti. “Χορός και Προφορική Ιστορία.” In *Χορός και Ιστορία* (Aridaia: Diethnis Organosi Laikis Technis, 2000), pp 284-287.

¹⁴⁷ Carolyn Laferrière. “Dancing with Greek Vases: Communicating through Sight, Movement, and Material.” *Greek and Roman Musical Studies* 9, no. 1 (Special issue. Netherlands: Brill, 2021), pp 85–114.

While the challenge of documenting the absolute historical precision and scientific certainty of the uninterrupted historical continuity from antiquity remains¹⁴⁸, there are undeniably substantial indications that numerous contemporary Greek dances retain archaic structural and morphological characteristics. These indications are identifiable both in choreographic structure and morphology as well as in accompanying ritualistic practices and social functions they perform¹⁴⁹.

The *Pyrrhichios*, an ancient martial dance that has survived in various contemporary manifestations, and the Pontians' knife dance¹⁵⁰, are particularly noteworthy examples of this historical continuity. The latter is documented in detail in Xenophon's *Anabasis*¹⁵¹, a work that also provides a comprehensive account of the military strategies and philosophies of the ancient world. Specifically, the historian provides an impressively accurate and narratively vivid description of how, upon his army's arrival at Kotyora in Pontus, he organized a choreographic exhibition to enhance morale and provide entertainment for his soldiers following an extended and arduous military campaign¹⁵².

The detailed choreographic description presented in the ancient text demonstrates remarkable morphological and structural similarity to its contemporary manifestation, thus providing rare and valuable documentation of its transhistorical continuity and constituting one of the few historical examples wherein we can trace with relative certainty the uninterrupted historical evolution of a specific dance motif from antiquity to the present day. We can thereby bridge a chronological span exceeding two millennia.

In traditional Greek society, dance is not merely an occasional form of entertainment restricted to formalized events and ritualistic occasions, such as nuptial ceremonies and communal festivals, but is organically and functionally

¹⁴⁸ Ilias S. Dimas. “Ελληνικοί παραδοσιακοί χοροί”. (Athens: Grafikes texnes Alekou Kalemi, 1993), pp 78-94.

¹⁴⁹ Ibid., pp 19-21, 78- .

¹⁵⁰ Nikos Zournatdzidis. “Συμβολή στην έρευνα του Ποντιακού χορού: χορευτικές διαδικασίες και χοροί του πόντου”. (Athens: Choreftikos Omilos Pontion “Serra”, 2025), pp 91-103.

¹⁵¹ Hertlein, Friedrich Karl Gottlob. “*Xenophons Anabasis*”. (Deutschland: Weidmann, 1854), pp. 237-239.

¹⁵² Nikos Zournatdzidis. “Συμβολή στην έρευνα του Ποντιακού χορού: χορευτικές διαδικασίες και χοροί του πόντου”. (Athens: Choreftikos Omilos Pontion “Serra”, 2025), pp 91.

integrated into the daily existence of the inhabitants, permeating all dimensions of social interaction. As articulated by Alkis Raftis in his seminal work “The World of Greek Dance”¹⁵³, contemporary urban contexts frequently confine choreographic expression to predetermined places and strictly defined times. However, traditionally, dance occupied the central position in community existence, pervading all aspects of daily life and substantially contributing to the formation of social cohesion.

Choreographic expression manifested in both public and domestic spheres. Within household environments or courtyards, during familial gatherings and celebratory occasions, and also within the framework of agricultural and pastoral labor activities, accompanying and regulating work processes. During any circumstance characterized by a favorable psychological disposition and convivial atmosphere, dance, through expressive kinetic articulation, was transformed into the privileged medium for emotional expression and social congregation, reinforcing interpersonal connections between community members and contributing significantly to the establishment of complex social networks¹⁵⁴.

A particularly significant characteristic of Greek choreographic tradition is the absence of a centralized, universal, generalized paradigmatic model from which diverse local variations are derived, but rather a decentralized and polymorphic developmental pattern. Each community developed, with remarkable autonomy and creative capacity, its distinctive choreographic repertoire, establishing a unique cultural idiom reflecting the particular historical, social, economic, and environmental conditions and collective experiences specific to that community¹⁵⁵. Concurrently, communities engaged in interactions and cultural exchanges with adjacent regions. These interactions, rather than resulting in homogenization, led to enrichment and further diversification of choreographic traditions, creating an intricate mosaic of local variations and regional idioms¹⁵⁶.

¹⁵³ Alkis Raftis. “Ο Κόσμος του Ελληνικού Χορού”. (Athens: Polytypo, 1985), pp 32-37.

¹⁵⁴ Nikos Zournatdzidis. “Συμβολή στην έρευνα του Ποντιακού χορού: χορευτικές διαδικασίες και χοροί του πόντου”. (Athens: Choreftikos Omilos Pontion “Serra”, 2025), pp 45-48.

¹⁵⁵ Alkis Raftis, Ο Κόσμος του Ελληνικού Χορού (Athens: Polytypo, 1985), pp 89-90.

¹⁵⁶ Ibid.

The scientific approach to traditional dances necessarily presupposes their examination as cultural products of specific circumscribed groups of neighboring villages or, in certain instances, of individual villages, contingent upon the geographical topography of the region and the possibilities for communication and interaction¹⁵⁷. This local differentiation and micro-local character of choreographic traditions render their study particularly demanding and methodologically complex, necessitating specialized knowledge of local conditions and a profound understanding of the social and cultural framework within which specific choreographic traditions developed and evolved temporally¹⁵⁸.

The decentralization in the formation of local traditions demonstrates that dance does not merely represent a unidimensional artistic expression, but rather a multifaceted social phenomenon that reflects with remarkable accuracy the particular conditions of each locality. The development and evolution of distinctive dances by each community reflects the unique cultural, social, and geographical context of that community. These differentiations, influenced by multiple factors such as geographical relief, local social structures and relationships, economic activities, and historical circumstances, contribute to the vitality and authenticity of traditional dance as a product of specific communities. Dissociating traditional dance from its collective experience and historical context would result in the loss of significant aspects of its meaning and cultural authenticity.

During the period of traditional culture, each community constituted a distinctive, homogeneous, and relatively autonomous cultural entity, representing a complete and cohesive life cycle that encompassed and regulated human existence from nativity to mortality. Within this cohesive framework, dance represented one of the central and fundamental elements of cultural expression and social cohesion, functioning simultaneously as a mechanism for socialization and intergenerational transmission of values, behavioral patterns, and collective memory¹⁵⁹.

¹⁵⁷ Ibid., 89

¹⁵⁸ Rickey Holden and Mary Vouras, *Greek Folk Dances* (Newark, NJ: Folkart Press, 1965), pp 7-8.

¹⁵⁹ Nikolaos G. Vavritsas. "*Παραδοσιακοί χοροί και η διδασκαλία τους: ρυθμοκινητική ανάλυση και ρυθμική αρίθμηση*" (Thessaloniki: Vavritsas Nikolaos, 2018), pp 29-39.

However, significant structural disruptions in traditional cultural frameworks emerged with the establishment of the independent Greek state in 1832 and its subsequent systematic intervention in traditional administrative organization and educational systems, through the introduction of centralized administrative mechanisms and implementation of standardized educational curricula. These new administrative structures standardized educational practices, and the gradual transition towards urbanization had a decisive impact on the social and cultural conditions within which choreographic tradition was developed and transmitted, precipitating significant changes in the function, form, and social role of traditional dances.¹⁶⁰

A fundamental ontological characteristic of traditional dance practice is the incorporation of three interconnected and inseparable dimensions: movement, sound, and verbal expression. This conceptualization of dance in Greek traditional society exhibits striking structural parallels with contemporary perceptions during antiquity, suggesting a profound cultural continuity across centuries. Despite historical transformations and influences from diverse cultural currents, the essential core of its cultural identity and structural characteristics have been maintained¹⁶¹.

Alkis Raftis¹⁶², emphasizes with particular methodological rigor that when these three fundamental constituent elements appear in isolation, detached from their comprehensive cultural context, they are incapable of conveying the completeness and authenticity of the choreographic experience. Conversely, their dynamic and functional integration creates a unified, comprehensive, and coherent cultural “text” that functions as an effective vehicle for social values, personal experiences, and collective memories. This holistic approach conceptualizes dance as more than a simple artistic manifestation; it establishes it as a complex semiotic system

¹⁶⁰ Ibid.

¹⁶¹ Fotios Mavrouniotis, Alexandros Malkogeorgos, and Eirini Argyriadou, *Ελληνικοί λαϊκοί χοροί: διδακτική των χορών, ο κοινωνικός & ψυχολογικός ρόλος του χορού, χορός & υγεία-χοροθεραπεία* (Thessaloniki: University Studio Press, 2013), pp 55-57, 58-147.

¹⁶² Alkis Raftis. “Ο Κόσμος του Ελληνικού Χορού”. (Athens: Polytypο, 1985), pp 42-46.

with multiple levels of meaning and communication, which expresses and reflects the broader social structures and cultural values of the community.

The documentary accounts of foreign travelers who traversed Greek territories during pilgrimages to the Holy Lands¹⁶³ constitute invaluable ethnographic sources for understanding dance's position in traditional Greek society, offering an external, comparative perspective. In their detailed descriptions, foreign travelers repeatedly express admiration for the elegance and refined deportment of women, as well as for the profound and manifest appreciation of local populations for music and dance. These descriptions thus provide unique testimonials regarding aspects of quotidian existence that frequently remain undocumented in official historical texts due to their self-evident and familiar nature for Indigenous observers.

The aforementioned testimonials emphatically confirm the central and multifunctional role of dance in the daily existence of inhabitants within Greek territories. Contrary to the notion of dance being merely an occasional recreational pursuit, it functions as a multidimensional and multifaceted cultural phenomenon, performing multiple social functions. These functions include serving as a repository of collective memory, a mechanism for preserving and transmitting cultural heritage, and a medium for expressing collective identity and social cohesion. This contributes decisively to the formation and maintenance of social fabric.

Of particular significance is the function of dance as a medium for the experiential transmission of knowledge, cultural values, and historical memory through intergenerational learning and the facilitation of the transfer of choreographic tradition¹⁶⁴. This is achieved not through formal or institutionalized pedagogical methodologies, as occurs in contemporary educational contexts, but through direct participation, systematic observation, and experiential imitation. This ensures the

¹⁶³ Ibid., pp 38-99.

¹⁶⁴ Nikolaos G. Vavritsas. *“Παραδοσιακοί χοροί και η διδασκαλία τους: ρυθμοκινητική ανάλυση και ρυθμική αρίθμηση”* (Thessaloniki: Vavritsas Nikolaos, 2018), pp 29-39.

preservation of tradition's authenticity and vitality, as well as its functional connection with broader social and cultural contexts¹⁶⁵.

This multifaceted process encompasses the preservation of not only dance forms and technical characteristics but also the transmission of underlying cultural values and social norms that are organically embedded within dance practices. Consequently, dance emerges as a multifaceted cultural phenomenon with profound social extensions and functions¹⁶⁶. Through this intricate process, dance serves as a conduit for an entire worldview and a comprehensive value system that is transmitted intergenerationally, playing an important role in shaping cultural identity and fostering community continuity through periods of historical change and social transformation¹⁶⁷.

The triadic nature of traditional dance (movement, sound, and verbal expression) underscores its holistic character and its function as a multi-level and multifaceted cultural system with various dimensions and aspects. Dance in traditional Greek society transcends aesthetic dimensions and technical execution, constituting a complex and multidimensional social phenomenon that performs multiple functions: expressive, communicative, symbolic, and educational. It is through these multiple and interconnected functions that dance becomes a primary cultural medium¹⁶⁸.

2.2 The Functionality of Dance in Traditional Society

The conceptualization of dance within traditional societal frameworks is antithetical to contemporary interpretations, as discussed above. Modern contexts frequently relegate dance to supplementary or performative functions, whereas in traditional

¹⁶⁵ Marigoula Kritsioti, "Χορός και Προφορική Ιστορία," in Χορός και Ιστορία (Aridaia: Diethnis Organosi Laikis Technis, 2000), pp 284-291.

¹⁶⁶ Ibid.

¹⁶⁷ Alkis Raftis, *Ο Κόσμος του Ελληνικού Χορού* (Athens: Polytypo, 1985), pp 38-42.

¹⁶⁸ Fotios Mavrouniotis, Alexandros Malkogeorgos, and Eirini Argyriadou. *"Ελληνικοί Χοροί"*. (Thessaloniki: Ekdotiki Aiginiou, [2006]), pp. 23-24.

society it was imbued with comprehensive functional characteristics¹⁶⁹. Contemporary dance practices are subject to significant spatial restrictions (confined to theatrical venues, cultural institutions, and designated performance spaces) and temporal limitations. In contrast, in Greek traditional society, dance represented an integral component of quotidian existence. Its pervasive presence accompanied both formalized ceremonial occasions (e.g. matrimonial celebrations, communal festivals) and the everyday activities of community inhabitants. Spatial considerations presented no impediment to choreographic expression, as dance occurred in diverse environments, while temporal constraints held minimal significance. The sole prerequisites for dance manifestation were appropriate psychological disposition and a conducive social atmosphere that would facilitate emotional expression. This pervasive integration of dance within social structural frameworks is a fundamental distinguishing factor between traditional societal organization and contemporary social configurations.

In traditional societal contexts, dance could not be conceptualized as an autonomous phenomenon¹⁷⁰, and consequently, it was methodologically impossible to separate choreographic expression from musical and vocal components¹⁷¹. This inseparability derived from the understanding that all three elements constituted different manifestations of a unified aesthetic reality. Whether in expansive festive congregations or intimate quotidian gatherings, the corporeal movement established an indissoluble connection between individual expression and collective identity¹⁷². This connection was predicated primarily on shared experiential frameworks and all cohesive elements within a social group. These elements transformed an aggregation of autonomous entities into a cohesive collective with common objectives, mutual ideological principles, shared pursuits,

¹⁶⁹ Alkis Raftis. “Ο Κόσμος του Ελληνικού Χορού”. (Athens: Polytypo, 1985), pp 38-42.

¹⁷⁰ Vasiliki K. Tyronola, Ο Ελληνικός Χορός: Μια διαφορετική προσέγγιση (Athens: Gutenberg, 2001), pp 50-52.

¹⁷¹ Fotios Mavrouniotis, Alexandros Malkogeorgos, and Eirini Argyriadou. “Ελληνικοί λαϊκοί χοροί: διδακτική των χορών, ο κοινωνικός & ψυχολογικός ρόλος του χορού, χορός & υγεία-χοροθεραπεία”. (Thessaloniki: University Studio Press, 2013).

¹⁷² Ilias S. Dimas, Vasiliki K. Tyronola, and Maria I. Koutsoumpa. “Ελληνικός Παραδοσιακός Χορός: Θεωρήσεις για το λόγο, τη γραφή και τη διδασκαλία του”. (Athens: [n.p.], 2010), pp 143-145.

behavioral norms, and cultural customs (as documented in accounts of foreign travelers, cited by Raftis¹⁷³). The process of cultural transmission, whereby children systematically emulated adult behaviors at every opportunity, did not conceptualize dance as formalized “choreography.” Instead, it was elevated to a position of intense and spontaneous emotional articulation, maintaining a direct and continuous dialogic relationship with the broader social environment¹⁷⁴.

As a cultural instrument created by and for society, traditional dance represents a social practice that adapts dynamically to societal transformations rather than constituting a static, museum-like cultural artifact. Its formal structure and substantive content undergo modification in accordance with changes in social structure and collective perceptions. This adaptive process enables dance to function as both an expression of contemporary social reality and a reflection of historical antecedents. Although experienced synchronically, at specific temporal moments, by the society it serves, dance inherently incorporates elements of diachronicity as it reflects forms, processes, and meaningful content from historical precedents. Without constituting a strictly defined historical event, dance narratively conveys the evolution of social and cultural phenomena. As an integral part of the Greek cultural heritage, dance acts as a mechanism for promoting everything that this community is, everything that this community believes in and stands for¹⁷⁵.

2.3 The Traditional Greek Festival ‘Panegyri’ as a Social-Cultural Phenomenon and Premier Event in Greek Traditional Society

¹⁷³ Alkis Raftis. “Ο Κόσμος του Ελληνικού Χορού”. (Athens: Polytypo, 1985), pp 38-99.

¹⁷⁴ Alkis Raftis. “Χορός, Πολιτισμός και Κοινωνία”. (Athens: Theatre “Dora Stratou”, 1992), pp 142-146.

¹⁷⁵ Marigoula Kritsioti, “Χορός και Προφορική Ιστορία,” in Χορός και Ιστορία (Aridaia: Diethnis Organosi Laikis Technis, 2000), pp 284-291, 295.

The panegyri (traditional festival) is a quintessential manifestation of dance's holistic function within the social infrastructure of traditional Greek society, as previously established¹⁷⁶. This multifaceted cultural event integrates religious ceremonial practices with communal congregation and traditionally coincides with the feast day commemorating a region's patron saint. Rather than being confined to a single day, the celebration typically extends across a three-day period. The festivities commenced on the eve of the saint's feast and concluded on the subsequent day, with participation expanding beyond local inhabitants to include visitors from neighboring communities on the principal feast day. The days before and after the feast day were reserved exclusively for local residents. The geographical dimension of this phenomenon assumes particular significance, as it facilitated the congregation not only of permanent residents but also of expatriates, who frequently undertook extensive journeys to participate in this unifying, communal experience. It provided the opportunity they sought to return to their ancestral homeland and reconnect with familial and social relations. Equally significant, it constituted the occasion when they maintained their identity as community members, reinforcing collective sentiments of cohesion and localized identity. These Greek fests, “panegyria”¹⁷⁷, thus demonstrated that geographical displacement did not sever cultural and social connections¹⁷⁸.

The panegyri adheres to a specific ritualistic protocol encompassing three fundamental elements: communal dining, vocal performance, and choreographic expression¹⁷⁹. These events function as the foremost platforms for showcasing the musical traditions of each locality, thereby serving as repositories of cultural heritage and mechanisms for intergenerational transmission of localized musical idioms. The sequence begins with communal dining, which transcends mere collective sustenance to become an initial phase of social interaction and communication. This is followed by “seated songs” (slow, non-dancing songs), which function as preparatory elements for the transition to dance, progressively

¹⁷⁷ Plural of panegyri

¹⁷⁸ Alkis Raftis. “Ο Κόσμος του Ελληνικού Χορού”. (Athens: Polytypo, 1985), pp 40-42.

¹⁷⁹ Ibid., pp 41

generating the requisite emotional atmosphere. These vocal performances, frequently executed without instrumental accompaniment or with minimal musical support, contribute to creating an ambiance of introspection and collective memory. When the appropriate emotional state has been established among participants and psychological preparation is deemed sufficient, the initial collective dance commences, functioning as the culmination of the ritual and as an expression of collective identity¹⁸⁰.

The choreographic process operates according to a stringent hierarchical structure that reflects the social organization and established frameworks of the traditional community. Each participant's position is predetermined and permanent, ensuring social continuity and stability. This permanence guarantees the preservation of intra-community bonds even under conditions of geographical dispersion of community members. It is noteworthy that even in the context of prolonged absence, such as emigration in pursuit of enhanced living conditions outside one's ancestral community, the entitlement to one's original position remains unalterable and indisputable. This practice enables a seamless reintegration of returnees into the community, allowing them to re-establish their position among those with whom they shared choreographic circles in their youth¹⁸¹.

The classificatory system exhibits significant local differentiations¹⁸², reflecting the particular social conditions of each region and diverse perspectives on social organization. In numerous regions, particularly in mainland Greece, the predominant arrangement positions men at the front following strictly seniority order, with women following according to the same criterion. This arrangement reflects traditional gender segregation and male primacy in public spaces, while simultaneously acknowledging the importance of age maturity as a determinant of social status. In other communities, the organizational structure of the dance circle is predicated primarily on marital status, distinguishing between married and

¹⁸⁰ Ibid.

¹⁸¹ Ibid., pp 42

¹⁸² Ibid.

unmarried participants, thus recognizing the transition to matrimonial status as a decisive milestone in social maturation.

Island practices present particular anthropological and ethnographic interests, where participation in choreographic circles may be organized according to families. In these contexts, gender distinction diminishes significantly, as gender does not constitute a primary classificatory criterion; instead, spouses are positioned adjacent to each other, symbolically representing marital unity. This practice reflects the centrality of matrimonial bonds and family units in the social organization of insular communities, where the family emerges as the primary unit of social reference¹⁸³.

A particularly noteworthy aspect of this practice is the invitation extended to the local priest to inaugurate the dance, thereby conferring a blessing upon the collective expression of the community. This ritualistic practice, far from being merely a participation of a revered individual, serves to underscore the profound religious dimension of the event, as well as the organic and indissoluble connection between ecclesiastical and secular domains within the framework of traditional Greek communities. This ritual serves to validate the compatibility between religious faith and folk tradition, thereby legitimizing festive expression as a continuation and extension of religious observance¹⁸⁴.

Following the initial collective dance, a transition occurs from a communal to a familial emphasis, characterized by individual initiatives to request specific dances. At this stage, the head of each family assumes a prominent role, paying the appropriate financial donation to the musicians for the performance of a specific dance of their selection. The primary position in the circle is typically occupied by the family patriarch, who, after demonstrating choreographic proficiency and symbolically affirming his leadership position, subsequently cedes the privileged position of lead dancer to his descendants. This ritualistic succession clearly demonstrates both the hierarchical structures of traditional family units and the

¹⁸³ Ibid., 38-42

¹⁸⁴ Ibid.

intergenerational transmission of social roles and privileges within the broader community¹⁸⁵.

A particularly salient sociological facet of this ceremony is the equitable treatment of all family units, irrespective of their financial status or social standing, during this phase. This equalizing practice, where requests to musicians are based on predetermined sequencing rather than financial capacity, ensures a sense of social justice and equitable participation in community life. The public dance thus transforms into a symbolic mechanism for validating fundamental social values: the permanence of social bonds, reverence for elders, preservation of family structures, and equality in the exercise of social rights. Participation in dance thus transcends mere recreational activity and becomes a symbolic confirmation of social cohesion and collective identity¹⁸⁶.

Additionally noteworthy is the regional differentiation regarding women's capacity to lead the dance, a phenomenon reflecting local cultural particularities and established social structures of each region¹⁸⁷. This heterogeneity provides a unique domain for the exploration of gender relations in traditional culture and the variability of cultural patterns across geographical regions. These diverse practices underscore how local societies adapt general cultural patterns to their specific conditions and requirements.¹⁸⁸ Consequently, the panegyri functions as a multidimensional mechanism for validating social boundaries, familial relationships, and interconnections between locals and visitors, establishing a common venue for congregation and communication.

The musical and choreographic characteristics of each geographical region of the Greek territory are distinctive and reflect the local cultural heritage and historical trajectory of each locality. An example of this is Epirus, where the musical tradition is fundamentally based on the pentatonic scale, imbuing melodies with a distinctive, primordial quality. The choreographic style in this region demonstrates

¹⁸⁵ Ibid.

¹⁸⁶ Ibid., pp 40.

¹⁸⁷ Ibid.

¹⁸⁸ Fotios Mavrovouniotis, Alexandros Malkogeorgos, and Eirini Argyriadou. *“Ελληνικοί Χοροί”*. (Thessaloniki: Ekdotiki Aiginiou, [2006]), pp 22-27.

remarkable diversity, ranging from slow and ponderous to rapid and exuberant, contingent upon thematic content and emotional resonance of accompanying songs. The thematic elements of Epirotic songs, which include expatriation, mortality, suffering, and loss, are indicative of the historical and social conditions that have shaped the region's collective consciousness¹⁸⁹. Epirotic panegyria are characterized by the presence of laments, which, through their lyricism and emotional intensity, constitute the most emblematic and emotionally resonant expression of the local musical tradition.

2.4 Greek Traditional Music and Its Relationship with Ancient and Byzantine Tradition

Greek traditional music, which provides the essential rhythmic and melodic framework for dance expression, has profound historical antecedents in ancient Greek musical systems and maintains direct genealogical connections with Byzantine ecclesiastical music as well as with the folk musical traditions of neighboring Eastern civilizations. This relationship goes beyond superficial morphological similarities to encompass fundamental structural characteristics pertaining to both melodic organization and rhythmic configurations, thus demonstrating exceptional cultural continuity across numerous centuries of historical development¹⁹⁰.

The theoretical foundation of ancient Greek musical systems is primarily attributed to Pythagoras and his intellectual disciples, the Pythagoreans, who established the inaugural comprehensive music theory predicated on mathematical relationships between acoustic intervals. Through rigorous experimentation with the monochord, the Pythagoreans established that musical intervals could be expressed through elementary numerical ratios: the octave corresponding to a proportional relationship of 2:1, the perfect fifth to 3:2, and the perfect fourth to 4:3.

¹⁸⁹Alex. Ch. Mammopoulos. “*Ήπειρος: λαογραφικά-ηθογραφικά-εθνογραφικά*”. (Athens: Typografeio Pan. Drouka kai Nik. Konsola, 1964)

¹⁹⁰Vasiliki K. Tyrovolas. “*Ο Ελληνικός Χορός: Μια διαφορετική προσέγγιση*”. (Athens: Gutenberg, 2001).

This revolutionary discovery facilitated systematic comprehension of acoustic phenomena and the harmonic relationships governing the entire sound spectrum¹⁹¹.

The Pythagorean conceptualization of music was not confined to purely aesthetic considerations; it incorporated musical principles into a comprehensive cosmological framework designated as the “harmony of the spheres.” In this framework, musical proportions were understood to reflect fundamental organizational principles of the universe. According to this philosophical perspective, identical mathematical proportions that govern harmonic relationships in music simultaneously regulate the movement of celestial bodies and the structural composition of the cosmos itself, thereby establishing a unified cosmic harmony that interconnects the microcosmic and macrocosmic domains¹⁹².

This theoretical foundation subsequently informed the development of musical systems by Byzantine, Arabic, and Persian civilizations, each of which formulated distinctive musical idioms based on these fundamental principles. Byzantine music, as the direct inheritor of the ancient Greek tradition, preserved and further elaborated the modal system of antiquity, adapting it to accommodate the liturgical requirements of Christian worship while simultaneously enriching it with innovative expressive elements¹⁹³.

Despite their individual differentiations, these musical traditions maintained the fundamental principles of the ancient Greek musical system with respect to both rhythmic organization and the structural configuration of melodic scales. This diachronic continuity, combined with various intercultural influences, has been identified as a significant contributing factor to the shaping of the distinctive characteristics of Greek traditional music, presenting it as an exceptionally rich and multifaceted cultural formation¹⁹⁴.

¹⁹¹ Giannis G. Kokkinos. “Ελληνικοί Χοροί: Ιστορική Εξέλιξη και μουσική ανάλυση”. (Thessaloniki: Salto, 1993).

¹⁹² Giorgos Ch. Lykesas. “Οι Ελληνικοί Χοροί: Ιστορική – Πολιτιστική – Κοινωνιολογική και Μουσικοκινητική Θεώρηση”. (Thessaloniki: University Studio Press, 1993), pp 23-45.

¹⁹³ Vasiliki K. Tyrovolas. “Ο Ελληνικός Χορός: Μια διαφορετική προσέγγιση”. (Athens: Gutenberg, 2001)

¹⁹⁴ Ibid.

One of the most distinctive features of Greek traditional music is its utilization of natural (non-tempered) scales, which stands in marked contrast to the tempered European scales composed exclusively of tones and semitones. The tempered system, which became established in Western music during the 18th century, divides the octave into twelve equal semitones, thereby simplifying musical practice and facilitating modulation between keys, but simultaneously restricting the expressive range of intervals¹⁹⁵.

In traditional music, conversely, scales adhere to genuine natural proportions with intervals categorized as major, minor, and minimal, thus permitting a considerably broader spectrum of melodic nuances and expressive possibilities. These intervals are grounded in natural acoustic principles and string vibrations, generating a range of tonal colorations that significantly exceeds the constraints imposed by the Western tempered system¹⁹⁶.

These intervals are practically rendered in various ways, contingent upon the specific musical instrument and the technical proficiency of the musician. For instance, when playing the lyra, the musician has the capability to produce the desired note in its natural position or to execute a “pull” that imparts special emphasis and coloration to the melodic line by applying different levels of pressure to the string or slightly modifying its position. This technique demands exceptional acoustic perception and refined instrument handling, abilities typically transmitted orally from teacher to student, thereby preserving the vitality of the musical tradition¹⁹⁷.

In wind instruments, such as the flute, bagpipe, zurna, and clarinet, equivalent expressive capabilities are achieved through partial coverage of the finger holes or specialized blowing techniques, thereby creating extremely subtle nuances in the melodic material. The experienced musician can produce infinitesimal differentiations in pitch, thus achieving precise renditions of traditional melodies with all their characteristic peculiarities intact.

¹⁹⁵ Giannis G. Kokkinos. “*Ελληνικοί Χοροί: Ιστορική Εξέλιξη και μουσική ανάλυση*”. (Thessaloniki: Salto, 1993), pp 97-102.

¹⁹⁶ Ibid.

¹⁹⁷ Ibid.

The employment of these non-standardized intervals, frequently referred to as “micro intervals,” constitutes a defining element of Greek traditional music aesthetics, endowing it with a distinctive timbre and expressive plasticity that fundamentally distinguishes it from the Western European musical tradition. This micro-interval approach additionally facilitates the expression of emotions and psychological states that prove difficult to convey through the tempered intervals of Western music, thus providing traditional music with particular emotional immediacy and expressive power.¹⁹⁸

The “pulls,” which emphasize specific notes, are also a fundamental characteristic of Byzantine ecclesiastical music, thereby indicating the cultural continuity and interaction between ecclesiastical and folk musical traditions within Greek territories. Byzantine music, with its complex modal system, subtle gradations of notes, and distinctive melodic patterns, profoundly influenced the folk musical tradition, particularly in regions that remained under Byzantine influence for extended historical periods¹⁹⁹.

Rhythm constitutes one of the fundamental structural elements of dance, originating from musical accompaniment – whether vocal, instrumental, or a combination thereof. The rhythmic organization in Greek traditional music exhibits extraordinary diversity and complexity, reflecting centuries of evolution and various cultural influences accumulated over time²⁰⁰.

In musical terms, rhythm is defined as the organized succession of sounds moving at predetermined time intervals based on sound duration and the distinction between strong and weak beats. Rhythm serves as the cornerstone for melody's construction, while concurrently dictating dance movement, thereby engendering an inextricable unity between music and dance. Melody's rhythm is perceived through the musical meter, the fundamental unit for measuring rhythm, which determines the aggregation of time values and the alternation between accented and unaccented pulses.

¹⁹⁸ Ibid.

¹⁹⁹ Ibid.

²⁰⁰ Vasiliki K. Tyrovolas. “Ο Ελληνικός Χορός: Μια διαφορετική προσέγγιση”. (Athens: Gutenberg, 2001), pp 53-55.

Meters in traditional music are categorized into three primary classifications, each exhibiting distinctive characteristics and expressive possibilities²⁰¹:

1. **Simple meters**: These feature denominators of 2 or 3, comprising duple meters (e.g. 2/4, 2/8) and triple meters (e.g. 3/4, 3/8). Simple meters cannot be further subdivided into smaller components and serve as the foundation for numerous traditional dances, including the syrtos in 2/4 or the tsamikos in 3/4. Their fundamental nature facilitates both ease of learning and execution, as well as the creation of complex rhythmic patterns through combinations and variations²⁰².
2. **Compound meters** are formed by combining two or more identical simple meters, creating more intricate rhythmic structures with enhanced expressive potential. Examples include 4/4, equivalent to two consecutive 2/4 measures, or 6/8, corresponding to the combination of two 3/8 measures. Compound meters facilitate the accommodation of more protracted melodic phrases and complex dance patterns while maintaining rhythmic consistency and predictability throughout performances²⁰³.
3. **Mixed meters** are generated from the combination of two or more dissimilar simple meters, resulting in asymmetrical rhythms with distinctive character and expressive dynamics. Examples include 5/8, a combination of 2/8 and 3/8, and 9/8, a combination of 4/8, 2/8, and 3/8. Mixed meters are particularly prevalent in the Balkans and Asia Minor, where they create characteristic “limping” rhythms that infuse music with vibrancy and expressiveness²⁰⁴.

A notable scholarly observation is that rhythms present in contemporary Greek traditional dances demonstrate remarkable continuity with their ancient counterparts, indicating a diachronic rhythmic tradition that has persisted despite significant historical transformations. As emphasized by Kokkinos in his comprehensive work “Greek Dances - Historical Evolution and Musical-Kinetic

²⁰¹ Giannis G. Kokkinos. “Ελληνικοί Χοροί: Ιστορική Εξέλιξη και μουσική ανάλυση”. (Thessaloniki: Salto, 1993), pp 97-102.

²⁰² Ibid., pp 100.

²⁰³ Ibid.

²⁰⁴ Ibid.

Analysis”, meters such as 2/4, 5/8, 7/8, 9/8, and other complex rhythmic structures²⁰⁵ characteristic of Greek traditional music can be traced to various poetic meters and dance patterns documented in antiquity.

Specifically, the seven-beat rhythm corresponds to the ancient *epitritos*, the five-beat to the *paeon*, and the nine-beat to the *dochmius with spondee*. This correspondence reveals a profound rhythmic continuity spanning millennia, constituting one of the strongest links between ancient and modern Greek musical traditions²⁰⁶. The preservation of these complex rhythmic patterns attests to both the inherent vitality of the tradition and its remarkable capacity to adapt to evolving social and cultural conditions while maintaining its essential identity.

One of the most distinctive features of Greek dance music, particularly in dances with triple rhythm, is the so-called isorhythmic structure. This musicological term refers to the foundation of melody upon a characteristic repetitive rhythmic pattern or motif that imparts the music's distinctive identity and constitutes the core of its rhythmic organization²⁰⁷.

The isorhythmic structure functions as a rhythmic ostinato (repetitive pattern) permeating the entire musical composition, providing the basis for melodic development and facilitating collective participation in dance. This rhythmic stability fosters a sense of security and predictability, which are essential for the harmonious execution of dance, particularly in cases involving numerous participants of varying ages and skill levels²⁰⁸.

The absolute repetition of identical rhythmic patterns throughout a melody's duration is a common phenomenon in Greek traditional music, thereby establishing a stable foundation for melodic development. This rhythmic consistency enables dancers to synchronize with ease and anticipate musical phrase progression, thus

²⁰⁵ Nikolaos G. Vavritsas. “Παραδοσιακοί χοροί και η διδασκαλία τους: ρυθμοκινητική ανάλυση και ρυθμική αρίθμηση”. (Thessaloniki: Vavritsas Nikolaos, 2018).

²⁰⁶ Giannis G. Kokkinos. “Ελληνικοί Χοροί: Ιστορική Εξέλιξη και μουσική ανάλυση”. (Thessaloniki: Salto, 1993), pp 97.

²⁰⁷ Vasiliki K. Tyrovolas. “Ο Ελληνικός Χορός: Μια διαφορετική προσέγγιση”. (Athens: Gutenberg, 2001), pp 53-55.

²⁰⁸ Ibid.

enhancing the collective dance experience and facilitating the integration and participation of community newcomers²⁰⁹.

However, this isorhythmic structure does not preclude expressions of individuality and personal creativity from either musicians or dancers. During musical improvisations, for instance, the fundamental rhythm becomes enriched with innumerable internal sonic micro-events based on the musician's personal rearrangements and technical manipulations. This dialectical relationship between stable rhythmic structure and improvisational expression constitutes one of the most fascinating characteristics of Greek traditional music, imbuing it with vitality and expressive richness²¹⁰.

Experienced musicians utilize this potential to create unique interpretations of familiar melodies by incorporating personal elements and ornamental embellishments that showcase their technical virtuosity and artistic temperament²¹¹. Similarly, lead dancers frequently introduce personal variations and improvisational elements to basic dance steps, creating individualized renditions of traditional dances that harmoniously blend collective tradition with personal innovation²¹².

As Tyrovola's seminal work "The Greek Dance"²¹³ observes, the consistent repetition of rhythmic patterns facilitates collective participation and the incorporation of improvisational elements, transforming dance into a dynamic process that synthesizes tradition with personal expression. The isorhythmic structure thus functions as a framework within which the dialogue between collective and individual, established and improvised, traditional and innovative unfolds, enabling both preservation and creative renewal of tradition.

This delicate equilibrium between stability and flexibility, collectivity and individuality, represents one of the most captivating aspects of Greek traditional

²⁰⁹ Ibid.

²¹⁰ Ibid.

²¹¹ Ibid.

²¹² Rickey Holden and Mary Vouras, *Greek Folk Dances* (Newark, NJ: Folkart Press, 1965), pp 5-6.

²¹³ Vasiliki K. Tyrovola. "Ο Ελληνικός Χορός: Μια διαφορετική προσέγγιση". (Athens: Gutenberg, 2001), pp 53-55.

music and dance, contributing significantly to its historical longevity and capacity to adapt to changing social and cultural conditions without sacrificing authenticity or vitality.

According to its lexicographical definition, traditional music can be conceptualized as a fundamental constituent within the broader framework of folk cultural expression, exhibiting a structural and functional relationship analogous to that of traditional dance. This cultural phenomenon cannot be reduced to mere aesthetic or recreational manifestations; rather, it represents a multidimensional sociocultural construct that permeates the entirety of communal existence, from agrarian labor practices and liturgical ceremonies to familial assemblies and collective festivities.

Traditional musical expressions function as sociocultural artifacts reflecting the hierarchical structures, axiological systems, and historical trajectories of their originating communities. In this sense, they can be considered repositories of collective memory and cultural identity. The textual components, melodic structures, and rhythmic patterns embedded within traditional musical compositions encapsulate the affective spectrum – from exultation to lamentation – as well as the aspirational dimensions, anxieties, cosmological beliefs, and phenomenological interpretations characteristic of the populace. These elements constitute a form of non-textual historiography and sociological documentation that preserves communal experiences across generational boundaries²¹⁴.

The transmission of traditional music is predominantly characterized by oral pedagogical methodologies applied intergenerationally through direct experiential engagement and participatory learning. This process facilitates the preservation of fundamental structural and expressive elements while simultaneously accommodating evolutionary adaptations in response to shifting sociohistorical contexts. This dynamic transmission mechanism, predicated upon immediate interpersonal interaction and experiential acquisition, ensures the maintenance of

²¹⁴ Giannis G. Kokkinos. “*Ελληνικοί Χοροί: Ιστορική Εξέλιξη και μουσική ανάλυση*”. (Thessaloniki: Salto, 1993), pp 99-102.

authenticity and expressive integrity within the musical tradition without relegating it to an immutable, fossilized form²¹⁵.

Furthermore, the oral transmission paradigm enables adaptive processes and qualitative enhancement through intercultural exchange with adjacent communities and the assimilation of novel compositional elements, in addition to recalibration following evolving social imperatives and aesthetic preferences. This dynamic process permits traditional music to maintain its vitality and contemporary relevance rather than being consigned to the status of a decontextualized cultural artifact divorced from current societal conditions²¹⁶.

In established ethnomusicological methodologies, traditional music is subjected to analytical frameworks that extend beyond purely acoustic phenomena to encompass it as a socially constructed practice. This approach emphasizes the conditions of production and consumption, the agents and mechanisms of transmission, and the societal functions it performs. A significant focus of scholarly inquiry lies in the examination of music's interconnectedness with complementary facets of folk culture, encompassing choreographic expressions, oral poetic traditions, religious ceremonial practices, and communal gatherings. This highlights the integrated nature of traditional cultural manifestations²¹⁷.

Greek traditional music exemplifies a remarkable cultural phenomenon, maintaining its core identity while undergoing evolution over the centuries. Its significance transcends mere entertainment, constituting a fundamental component of Greek cultural heritage and national identity.

Several technical elements distinguish Greek traditional music:

- The employment of natural scales in place of the tempered scales characteristic of Western European music.
- The presence of complex asymmetrical rhythms that mirror cultural continuity extends back to antiquity.

²¹⁵ Marigoula Kritsioti, "Χορός και Προφορική Ιστορία". In *Χορός και Ιστορία* (Aridaia: Diethnis Organosi Laikis Technis, 2000), pp 287-291.

²¹⁶ Ibid.

²¹⁷ Fotios Mavrovouniotis, Alexandros Malkogeorgos, and Eirini Argyriadou. "Ελληνικοί Χοροί". (Thessaloniki: Ekdotiki Aiginiou, [2006]), pp 168-169.

- The incorporation of distinctive melodic “pulls” or microtonal inflections facilitated by specialized playing techniques.
- The presence of isorhythmic structures that encourage communal participation and improvisation.

The primary mode of transmission of Greek traditional music is through oral tradition, with knowledge being passed down through direct participation and experiential learning from one generation to the next. This method of preservation has ensured the maintenance of authenticity while allowing for the gradual incorporation of new elements that reflect changing social conditions²¹⁸.

In contemporary society, Greek traditional music continues to serve as a vital link between past and present. As globalization accelerates cultural homogenization, these musical traditions assume increased importance as repositories of cultural memory and expressions of distinct Greek identity.

The ability of Greek traditional music to endure periods of significant historical change attests to both its cultural importance and its adaptability, qualities that have ensured its continued relevance in modern Greek society.

2.5 Identifying Excellence in Traditional Dance: A Methodological Framework

The evaluation of dancing proficiency within traditional dance environments extends beyond technical execution to encompass social representation and cultural authenticity. A “good dancer” is one who demonstrates precision in step execution and musical perception, while also serving as an authentic representative of community values and aesthetic traditions²¹⁹.

This complex evaluation process relies on established yet unwritten social codes that have developed organically within communities over generations. The dancer

²¹⁸ Alkis Raftis. “Ο Κόσμος του Ελληνικού Χορού”. (Athens: Polytypo, 1985), pp.62-65.

²¹⁹ Alkis Raftis. “Ο Κόσμος του Ελληνικού Χορού”. (Athens: Polytypo, 1985), pp 40-42, 89-100.

must navigate between faithful reproduction of traditional patterns and appropriate personal expression, a balance that requires significant cultural understanding. The determination of dance excellence in traditional settings is influenced by several critical factors.

Improvisational ability is a fundamental indicator of dancing excellence, with skilled dancers starting from the local movement idiom as a foundation, thoughtfully extending it without compromising its essential character. This requires maintaining a delicate equilibrium between tradition and creativity, which can be termed “innovation within boundaries”.

Community validation plays a decisive role in identifying good dancers. Elderly community members, as custodians of tradition, possess the cultural authority to recognize and legitimize skilled performers based on community-established standards developed over generations.

The **authentic representation** of the community's movement aesthetic is essential, with the dancer embodying the “local idiom” in a manner consistent with collective sensibilities rather than focusing solely on technical virtuosity²²⁰.

Researchers studying traditional dance employ several complementary approaches:

Field research constitutes the foundation of understanding dance excellence, with direct contact with local populations being indispensable. Informants, notably elderly community members, provide indispensable context concerning participation patterns, musical accompaniment traditions, and families with dance heritage²²¹.

Participant observation enables researchers to develop experiential knowledge of dance practices by engaging directly in dance activities, thus gaining insights not attainable through observation alone.

²²⁰ Fotios Mavrovouniotis, Alexandros Malkogeorgos, and Eirini Argyriadou. “Ελληνικοί Χοροί”. (Thessaloniki: Ekdotiki Aiginou, [2006]), pp 147-158, 168-169.

²²¹ Alkis Raftis. “Ο Κόσμος του Ελληνικού Χορού”. (Athens: Polytypo, 1985), pp 40-42, 89-100.

Multimedia documentation through videography and photography creates valuable research material that can be analyzed systematically and preserved for future study.

Local festivals provide an optimal setting for observation, as they naturally display social hierarchies, improvisational practices, and community traditions. Researchers can observe skilled dancers in authentic performance contexts²²².

The ultimate research objective is to understand how dance is experienced, evaluated, and given meaning within its authentic cultural environment. This perspective differs fundamentally from decontextualized stage representations.

Oral testimonies and collective memory play decisive roles in this process, positioning dance as a functional carrier of community historical continuity. This approach recognizes dance not as an isolated artistic expression but as an integrated element of cultural identity²²³.

By making use of the above methodology, researchers can develop a comprehensive understanding of dance excellence that honors both technical skill and cultural significance within traditional communities.

2.6 Differentiation between Traditional and Folkloric Dance

The theoretical framework within dance ethnography and cultural heritage studies is predicated on a conceptual distinction between traditional and folkloric dance²²⁴.

This distinction enables scholars to analyze dance not merely as a series of choreographed movements but as a cultural phenomenon embedded within specific social contexts. Traditional dance²²⁵ represents an organic component of rural agricultural communities, where dance functions as an integral expression of collective identity. Within these communities, dance emerges as a natural

²²² Ibid.

²²³ Ibid.

²²⁴ Fotios Mavrovouniotis, Alexandros Malkogeorgos, and Eirini Argyriadou. *“Ελληνικοί Χοροί”*. (Thessaloniki: Ekdotiki Aiginiou, [2006]), pp 175-176.

²²⁵ Alkis Raftis. *“Ο Κόσμος του Ελληνικού Χορού”*. (Athens: Polytypο, 1985), pp 18-19.

extension of daily life, transmitted through generational participation and embedded within broader social practices. The traditional dancer acquires proficiency through continuous immersion in community events where dance serves functional social purposes rather than performative ones. By contrast, folkloric dance²²⁶ represents a decontextualized reproduction of traditional forms. Though visually similar to traditional dance, folkloric expressions fundamentally differ in their sociological function and transmission mechanisms. The folkloric dancer learns choreography through formal instructional processes rather than through cultural immersion, resulting in technically accurate but experientially different performance.

In traditional societies, primarily agricultural and relatively closed communities, dance expression is transmitted from generation to generation while maintaining an indissoluble connection with the overall cultural framework. This form of dance authentically reflects the values, beliefs, and lifestyles of the society that reproduces it. People within these communities grow up with dance as a natural and inseparable part of their daily lives, acquiring dancing skills through experiential learning and participation in social events rather than through formalized instruction²²⁷.

In contrast, folkloric dance, though drawing from traditional forms, has become detached from its authentic social context. This superficial similarity obscures significant differences in function and significance. Consequently, dance, once a living cultural expression, becomes either a performative art form with aesthetic and technical standards comparable to ballet or, alternatively, reduced to simplified gymnastics or musico-kinetic exercise, devoid of its profound cultural significance. The dissemination of dance knowledge follows distinctly different pathways within traditional versus folkloric contexts.²²⁸

The transmission of traditional dance occurs through informal, intergenerational channels within familial and community structures. This process emphasizes

²²⁶ Ibid., pp 20-21.

²²⁷ Nikolaos G. Vavritsas, *Παραδοσιακοί χοροί και η διδασκαλία τους: ρυθμοκινητική ανάλυση και ρυθμική αρίθμηση* (Thessaloniki: Vavritsas Nikolaos, 2018), pp 29-33

²²⁸ Ibid.

experiential learning through direct participation in authentic social events, thereby creating a continuous, unbroken line of cultural inheritance. The dancer absorbs not only movement patterns but also the social codes, emotional registers, and cultural meanings embedded within each dance. In contrast, the transmission of folkloric dance relies on institutional mechanisms, including dance academies, physical education curricula, cultural associations, and media representations. This formalized instruction necessarily abstracts dance from its original context, focusing on the technical reproduction of movement sequences rather than their cultural significance, and thus results in what scholars term a “museological” approach to dance preservation²²⁹. The fundamental differentiation lies in transmission modality: traditional dance passes through natural community channels, while folkloric dance disseminates through modern institutional mechanisms of reproduction, including formally trained dance instructors, physical education teachers, educational institutions, cultural associations, and mass media platforms. This shift in transmission context inevitably alters both the form and function of the dance itself, even when the visible choreographic elements appear identical²³⁰.

The interpretation of dance movements varies significantly between traditional and folkloric approaches. In traditional contexts, dance “steps” encompass the full range of bodily expressions, including foot movements, posture, arm positions, and momentary stillness, all of which carry cultural significance. In traditional contexts, each movement element functions as part of an integrated expression of community values and aesthetic principles, rather than as discrete technical components. In contrast, folkloric instruction typically reduces these complex movement patterns to standardized choreographic sequences, emphasizing precise execution over contextual understanding. This reduction often results in what anthropologists describe as the “sterilization” of movement, technically

²²⁹ Alkis Raftis. “Ο Κόσμος του Ελληνικού Χορού”. (Athens: Polytypο, 1985), pp 18-21.

²³⁰ Marigoula Kritsioti. “Χορός και Προφορική Ιστορία”. In *Χορός και Ιστορία* (Aridaia: Diethnis Organosi Laikis Technis, 2000), pp 287-291.

accurate but lacking the cultural embodiment that characterizes authentic traditional expression²³¹.

In addressing dance technique, the term “steps” in traditional dance does not exclusively refer to gymnastic foot movements²³² but rather encompasses the totality of bodily movements and expressions executed during dance activity. These include foot lifting, jumping, momentary immobility, and combinations of multiple movements that collectively compose complete dance expressions. This holistic understanding stands in marked contrast to folkloric interpretations, which often reduce steps to isolated, sterile body movements, an approach that is particularly evident in contemporary teaching methodologies²³³.

In circular dance formations, the most common, as previously seen, configuration in Greek traditional dance, four fundamental directional orientations exist: movement following the dance direction with either front or back facing; movement against the dance direction, similarly with either orientation; movement toward the circle's center; and movement from center toward periphery. Notably, in most traditional dances, dancers maintain an obliquely frontal posture relative to the dance direction, allowing movement flexibility in any direction based on specific dance requirements²³⁴.

The preservation of authentic traditional dance forms necessitates comprehensive documentation prior to the irreversible alteration of their fundamental characteristics by urbanization, tourism, and staged performances²³⁵. This documentation process must extend beyond mere recording of movement sequences to encompass the full cultural context that imbues these movements with meaning within their communities of origin. Consequently, folklore researchers seeking to study authentic traditional dance forms undertake field recordings in traditional communities before external influences -including staged

²³¹ Giannis G. Kokkinos. “*Ελληνικοί Χοροί: Ιστορική Εξέλιξη και μουσική ανάλυση*”. (Thessaloniki: Salto, 1993), pp 99-102.

²³² Alkis Raftis. “*Ο Κόσμος του Ελληνικού Χορού*”. (Athens: Polytypo, 1985), pp 18-21.

²³³ Vasiliki K. Tyronola, *Ο Ελληνικός Χορός: Μια διαφορετική προσέγγιση* (Athens: Gutenberg, 2001), pp 15-52.

²³⁴ Giannis G. Kokkinos. “*Ελληνικοί Χοροί: Ιστορική Εξέλιξη και μουσική ανάλυση*”. (Thessaloniki: Salto, 1993), pp 97-102

²³⁵ Alkis Raftis. “*Ο Κόσμος του Ελληνικού Χορού*”. (Athens: Polytypo, 1985), pp 18-21.

performance, tourist exploitation, or urbanization- significantly alter their primary characteristics²³⁶.

2.7 Recording Practices: Steps and Methods

The systematic documentation of traditional dances within field research is considered a fundamental methodological practice in contemporary folklore studies. This approach is intended to preserve, document, and transmit intangible cultural heritage to future generations. The folklorist or ethnologist is required to conduct a thorough bibliographic review and employ interdisciplinary methodological frameworks to ensure the validity and reliability of the research²³⁷. The delineation of the research domain constitutes a pivotal methodological juncture. Researchers meticulously select specific geographical areas or settlement groups characterized by population homogeneity to capture dance phenomena in their primary form, thereby minimizing external influences. In instances where population movements or cultural crossings are observed, researchers are obliged to undertake comprehensive interviews with both current residents and those who have migrated, with the objective of accurately documenting authentic community dance patterns²³⁸.

Unlike music with its pentagram notation system, dance developed a kinesiological recording method relatively late. In 1928²³⁹, the Laban method was established as a system for writing movements. However, it remains challenging to create a comprehensive notation method for historical dances, as recording the kinesiological pattern requires documentation of not only the steps but also the movements of all body parts, the expression, and the style of the dance, including the energy emanating from it. All these elements are essential for the dance to be recorded and thus transmitted as authentically as possible²⁴⁰. Below are several

²³⁶ Konstantina Spiliotopoulou. "Εισάγοντας την Προφορική Ιστορία στην έρευνα των παραδοσιακών χορών". In *Dance and Oral History*, ed. Alkis Raftis (Ioannina: International Organization of Folk Art-Greek Section, 2001), pp 224-229.

²³⁷ Alkis Raftis. "Ο Κόσμος του Ελληνικού Χορού". (Athens: Polytypo, 1985), pp 89-100.

²³⁸ Ibid.

²³⁹ Ibid., pp 98-99.

²⁴⁰ Ibid., pp 99.

examples of kinesiological notation for some of the dances documented in the present research. Dances have been selected from all three regions, including both slow and fast dances, with small and large kinetic/dance motifs.

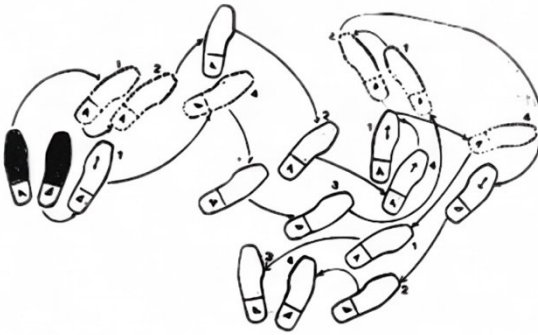


Figure 1: Zagorisios

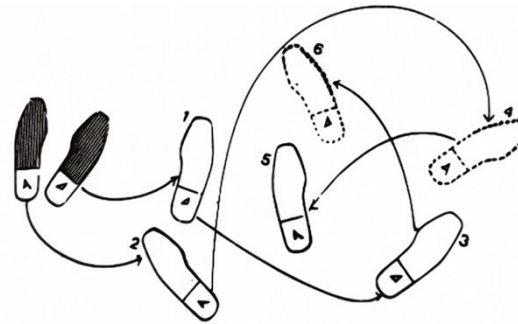


Figure 2: Sirtos sta Tria

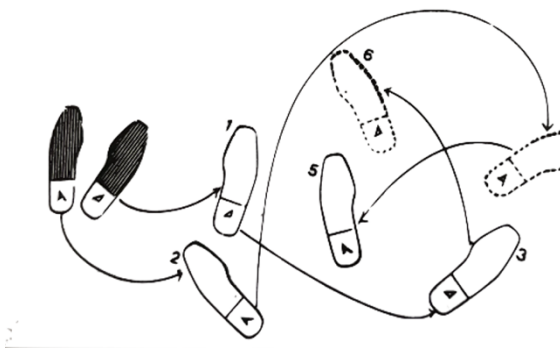


Figure 3: Siganos

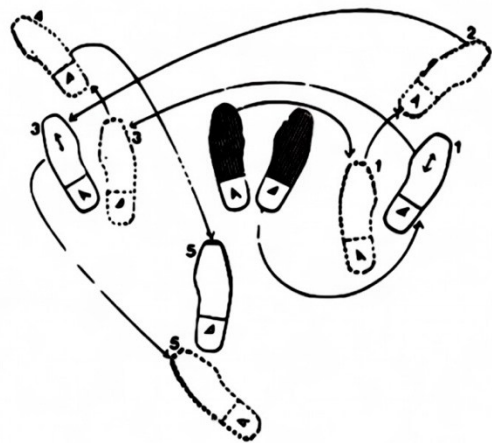


Figure 4: Pentozalis



Figure 5: Trigona

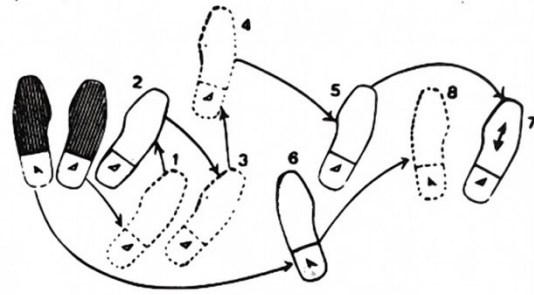


Figure 6: Kotsari

2.8 Participant Observation Methodology

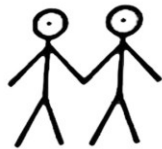
Participant observation constitutes the epistemological foundation of folklore research²⁴¹, with the researcher participating in authentic community performances and applying participant observation techniques when conditions permit. The structural, morphological, and stylistic elements of dance are documented, including:

- Morphology of holds and body postures²⁴²

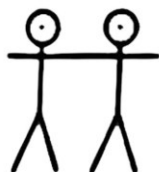
²⁴¹ The scientific branch that studies all aspects of folk culture. The term “λαογραφία” has been used in Greek, while in German the term “volkskunde” has been established.

²⁴² The way dancers hold each other varies across different dances. Depicted in the graphs are the distinct variations of holds observed throughout the traditional repertoire.

From the palms



From the shoulders



With bent elbows



Arm-in-arm



- Step patterns, spatial arrangement, and kinesiological motifs
- Improvisational elements and personal expressive variations
- Micro-kinetic manifestations and local stylistic idioms

For the purpose of producing scientifically valid documentation, folklorists employ audiovisual tools or specialized methods such as Laban notation, with a focus on movements, body posture, and rhythmic differentiations that constitute each dance tradition's distinctive “local idiom”.²⁴³

2.9 Interview Techniques and Oral History

The collection of oral testimonies represents a crucial component of the research methodology. In-depth interviews with community members, particularly elderly informants with direct participation experience in traditional dance contexts, provide invaluable insights regarding²⁴⁴:

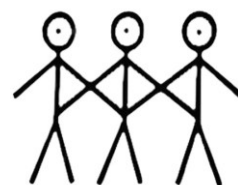
- the historical evolution of specific dances within the community.
- the social functions and symbolic meanings attributed to dance activities.
- the occasions and contexts where specific dances were traditionally performed.
- notable dancers and their distinctive stylistic characteristics; and
- musical accompaniment practices and their relationship to dance execution.

These interviews require structured protocols while allowing flexibility to capture spontaneous narratives and personal experiences. Audio recording of these

On the waist



From the belts



²⁴³ Fotios Mavrovouniotis, Alexandros Malkogeorgos, and Eirini Argyriadou. “Ελληνικοί Χοροί”. (Thessaloniki: Ekdotiki Aiginou, [2006]), pp 161.

²⁴⁴ Nikolaos G. Vavritsas, Παραδοσιακοί χοροί και η διδασκαλία τους: ρυθμοκινητική ανάλυση και ρυθμική αρίθμηση (Thessaloniki: Vavritsas Nikolaos, 2018), pp 33-35.

testimonies creates an archive of oral history that complements physical dance documentation²⁴⁵.

2.10 The Relationship between Music and Dance

The relationship between music and dance constitutes a fundamental aspect that requires specialized documentation. Researchers must record the following:

- Musical instruments that have been traditionally used for accompanying specific dances
- Rhythmic patterns and their relationship to dance steps
- Melodic structures and their influence on dance expression
- Song lyrics that are associated with specific dances and their cultural significance
- Variations in musical interpretation and their impact on dance execution

This documentation requires collaboration between dance researchers and ethnomusicologists to ensure a comprehensive analysis of this interdependent relationship²⁴⁶.

2.11 Data Processing and Interpretation

The collected research materials undergo systematic processing and interpretation through established methodological protocols. These include:

- Transcription of interviews and field notes following scientific standards
- Categorization and indexing of audiovisual material for reference purposes
- Comparative analysis of collected data with existing scholarly literature

²⁴⁵ Konstantina Spiliotopoulou. “Εισάγοντας την Προφορική Ιστορία στην έρευνα των παραδοσιακών χορών”. In *Dance and Oral History*, ed. Alkis Raftis (Ioannina: International Organization of Folk Art-Greek Section, 2001), pp 224-229.

²⁴⁶ Vasiliki K. Tyronola, *Ο Ελληνικός Χορός: Μια διαφορετική προσέγγιση* (Athens: Gutenberg, 2001), pp 15-52.

- Cross-referencing information from different sources to establish validity
- Development of analytical frameworks for interpreting dance phenomena within their cultural context

This scientific approach transforms raw research data into structured knowledge, contributing to the academic understanding of traditional dance as both cultural heritage and living practice.

The ethical principles that guide the research process are outlined below:

- Obtaining informed consent from community members before documentation
- Respecting cultural sensitivities and community ownership of traditional practices
- Acknowledging the contributions of informants and community members
- Providing communities access to research findings and documentation materials
- Ensuring responsible use of collected materials for educational and preservation purposes

These ethical considerations ensure that research respects the communities whose cultural expressions are being documented while fulfilling the scholarly mission of preserving intangible cultural heritage.

The collection of oral testimonies represents a fundamental component of research methodology²⁴⁷. The researcher:

- Conducts in-depth interviews (focused individual or collective) with community members of different age groups, with particular emphasis on the elderly, who constitute the custodians of dance tradition.
- Applies the methodological principles of oral history²⁴⁸, systematically recording narratives on audiovisual media.
- Highlights through interviews:

²⁴⁷ Alkis Raftis. “Ο Κόσμος του Ελληνικού Χορού”. (Athens: Polytypo, 1985), pp 89-100.

²⁴⁸ Konstantina Spiliotopoulou. “Εισάγοντας την Προφορική Ιστορία στην έρευνα των παραδοσιακών χορών”. In *Dance and Oral History*, ed. Alkis Raftis (Ioannina: International Organization of Folk Art-Greek Section, 2001).

- Subjective meanings regarding the value and function of dance.
- Diachronic changes in dance practices.
- Emic criteria for evaluating dance skill, defining the concept of the “good” dancer.
- Community participation in festive events.
- The role of musicians and the lead dancer.
- Family traditions related to dance practice.

The researcher conducts a systematic comparative analysis of dance phenomena, documenting:

- The distinctive characteristics of each settlement or area regarding rhythm, holds, step patterns, and social practices that frame dance performance
- Phenomena of cultural influence, fusion of different traditions, or preservation of older elements
- The socio-historical conditions that contributed to the formation of local dance idioms. Comprehensive iconographic documentation of dances includes:
 - Systematic photography of dance performances
 - High-definition video recording of dances in their natural environment
 - Diagramming of dance scenes with a depiction of the spatial arrangement of dancers. It is important to note that while many aspects of folklore research can be conducted by ethnographers without specialized dance experience, the accurate depiction of kinesiological elements depends largely on the personal abilities, theoretical knowledge, and dance talent of the researcher. The advent of modern motion capture technology has the potential to overcome this methodological limitation by enabling direct recording of the interviewee's movements, thus ensuring the most authentic documentation of the dance as performed in each geographical area.

Through this multidimensional methodological approach²⁴⁹, the researcher achieves scientifically valid documentation of the dance phenomenon in its natural

²⁴⁹ Alkis Raftis. “Ο Κόσμος του Ελληνικού Χορού”. (Athens: Polytypo, 1985), pp 89-100.

state, before potential alterations occur from folkloric representation or other staged forms of performance²⁵⁰. The ultimate scientific objective is the preservation of tradition as living cultural capital, ensuring that subsequent generations have access to authentic dance data and their complex socio-historical dimension.

2.12 Comparative Research: Justification of the Selection of the Three Regions Concerned and Analytical Description of Selected Dances

2.12.1 Methodological Framework and Selection Criteria

The present study focuses on the documentation and analysis of traditional dances from three distinct geographical and cultural regions of Greece: Epirus, Crete, and Pontus. The selection of these regions was not arbitrary but rather dictated by specific scientific criteria designed to establish a comprehensive methodological framework for comparative analysis.

The exceptional diversity of Greek dance tradition presented a significant methodological challenge in the selection process, as even neighboring settlements frequently exhibit notable variations in dance forms and stylistic elements. To address this challenge, the research adopted fundamental selection criteria to identify dances that:

- Constitute characteristic examples of the cultural identity of each region
- Present morphological and stylistic particularities that reflect local cultural idioms
- Maintain their structural characteristics over time, despite individual variations and interpretations

²⁵⁰ Rickey Holden and Mary Vouras. *"Greek Folk Dances"*. (Newark, NJ: Folkart Press, 1965).

The application of these criteria ensured that the selected dances would serve as representative samples of their respective regions while facilitating meaningful cross-regional comparative analysis.

2.12.2 Theoretical Basis for Regional Selection

The selection of Epirus, Crete, and Pontus as focal regions for this study is grounded in a structured theoretical foundation that combines geographical, historical, and cultural parameters. Each region presents distinctive characteristics that make it valuable for comparative research. Crete and Pontus represent two geographically distant regions of Hellenism with significant historical and cultural particularities.

Crete, the largest island of Greece, was officially incorporated into the national territory only in 1913 following the Balkan Wars. Pontus, an ancient region of northeastern Asia Minor bordering the Black Sea, served as a center of Greek culture for more than 2,500 years until the population exchange of 1923 following the Treaty of Lausanne.

Despite their considerable geographical distance, these two regions demonstrate remarkable historical interconnections that make them particularly interesting for comparative study. Historical records demonstrate that populations from these regions encountered each other and coexisted in common geographical spaces on multiple occasions, notably after the recapture of Crete from Arab control and following the Asia Minor Catastrophe of 1922. These historical intersections facilitated cultural exchanges and mutual influences that may be reflected in their respective dance traditions.

The selection of Crete and Pontus specifically aims to investigate potential cross-cultural influences between these distinct cultural groups. The overarching objective of this research initiative is to identify cultural borrowings in kinesiology and dance expression that may serve as indicators of relationships between these cultural groups, despite their geographical separation.

Epirus was deliberately selected as the third study area to function as a comparative reference point. This region is characterized by the following:

- Geographical distance from both Crete and Pontus
- Distinctive geographical features and mountainous terrain that contributed to its relative cultural isolation throughout much of its history
- Limited external cultural influences due to its geographical containment.

The incorporation of Epirus into the methodological framework serves a specific analytical purpose: by including a region with distinctly different cultural characteristics, the research can more clearly identify and document common elements that may exist between Crete and Pontus. This three-way comparison enhances the methodological rigor of the study by making potential similarities between the primary regions of interest more apparent and scientifically verifiable.

2.12.3 Regional Characteristics and Dance Traditions

Epirus is a region of notable topographical heterogeneity, with a rich and distinctive musical and dance tradition. Like Crete, it was officially incorporated into Greece in 1913. The region is characterized by pronounced topographical relief, creating a rugged, mountainous landscape with the exception of limited areas surrounding the urban centers of Ioannina and Arta. This geographical isolation is a significant contributing factor to the development of its distinctive cultural traditions.

The musical tradition of Epirus is characterized by exceptional richness and diversity, with several distinctive characteristics that set it apart from other Greek regional traditions. One of the most notable features is its polyphonic singing expression, where a deep voice produces a continuous drone sound as the foundation for the melodic line. The pentatonic scale forming the basic structure of Epirotic music is theorized by ethnomusicologists to have maintained continuity in this geographical area for millennia. Intriguingly, this pentatonic scale shares affinities with musical structures found in diverse cultural contexts, including those of Indian and Chinese musical traditions.

Folk festivals represent a particularly privileged field of expression for the Epirotic musical tradition. These gatherings serve not only as performance venues but also as significant social institutions that function as meeting places and gathering points for Epirotes returning to their places of origin. The thematic content of Epirotic musical expression frequently engages with experiences of death, loss, migration, and suffering, which are transformed into music and lyrics that compose the most characteristic expression of Epirotic folk music: the laments (moirologia). A distinctive characteristic of Epirotic festivals is their cyclical structure, which typically begins and ends with laments dedicated to those who are absent or lost forever.

The dance traditions of Epirus demonstrate remarkable versatility, alternating between slow, heavy movements and fast, joyful expressions. This variation is not arbitrary but rather determined according to the personal emotional state of the lead dancer and their non-verbal communication with the musicians of each “zygia” (traditional musical ensemble), who musically accompany and enhance the dancer's steps.

Crete, the largest Greek island with its extensive historical legacy stretching back to the Minoan civilization, developed a distinctive dance tradition characterized by its “jumping” and highly improvisational dances. Prominent examples include Pentozalis, Maleviziotis, and Chaniotikos, which feature various sections with calculated alternations between slow and fast tempos and are distinguished by their dynamic figures that offer opportunities for individual expression.

The tradition of heroism is deeply ingrained in Cretan consciousness, connecting Cretans with the wider Greek identity throughout various historical periods. This cultural characteristic is evident in their dance traditions, which often incorporate elements that suggest martial prowess and physical dexterity. Cretan music typically features the distinctive sound of the Cretan lyra or, in some regions, the violin. The dance character, even in its most lyrical manifestations, maintains a crisp and sinewy quality that reflects the distinctive aesthetic sensibilities of the island. Each of the four most popular Cretan dances offers possibilities for

seemingly endless variations, with the actual expression depending significantly on the individual dancer's technical proficiency and interpretive abilities.

Pontus, a region with a profound Greek presence spanning over 2,500 years, has cultivated a dance tradition that is marked by its distinctiveness, a quality that has endured even in the aftermath of the traumatic population exchange of 1923. Pontic dances are distinguished by their distinctive “knee-bending” rhythms, exemplified in dances such as “Tik Diplo” and “Kotsari.” Pontic dances are widely regarded as being among the most technically demanding traditional Greek dances in terms of both rhythmic complexity and stylistic execution. An examination of the historical performance context of Pontic dances reveals interesting evolutionary patterns. Initially, most Pontic dances were performed in a closed circular formation, emphasizing community participation, in traditional village settings. However, contemporary performance practice, particularly among younger Pontians, frequently presents these dances in linear formations. This transformation can be attributed to the influence of contemporary performance ensembles that favor open linear arrangements over closed circle formation.

The musical accompaniment for Pontic dances is characterized by the distinctive use of the Pontic Lyra, a musical instrument that differs significantly in both construction and playing technique from its Cretan counterpart. The musical repertoire exhibits both consistency and variation, with different melodies accompanying fundamental dances such as Tik and the two Omal dances. At the same time, Serra is associated with two or three specific melodic structures. Their unique melodic accompaniment characterizes the majority of other dances in this tradition. A distinctive attribute of Pontic musical practice is the tendency for the same lyrics to be sung with different melodies. The lyra player's role involves selecting lyrics improvisationally and leading the vocal performance, thereby illustrating the intricate interweaving of instrumental music, song, and dance in this tradition. An analysis of the socio-historical contexts within which these three dance traditions evolved provides valuable interpretive approaches for understanding their distinctive characteristics and potential interconnections.

The Epirotic dance tradition has emerged within a social framework characterized by geographical isolation, challenging living conditions, and significant migratory patterns. These factors have shaped both community structure and cultural expression, contributing to the development of a dance tradition that balances communal participation with individual expressions of emotion, particularly in relation to experiences of separation and loss. The Cretan dance tradition is inextricably linked to the island's historical trajectory and its inhabitants' struggles for freedom and self-determination throughout periods of foreign occupation. The deeply rooted tradition of heroism in Cretan consciousness is manifest in the extroverted and dynamic character of their dances, which offer extensive improvisational possibilities that reflect cultural values emphasizing individual initiative and physical prowess. The Cretan dance tradition functions as a symbolic field for expressing social identity, where local society's values and ideals are continuously reproduced and transformed through physical expression.

By contrast, the Pontic dance tradition developed within a significantly different historical context, emerging amid continuous efforts to maintain cultural identity in frequently hostile environments. The historical experience of forced resettlement following the 1923 population exchange heightened the need for cultural survival through the preservation of traditional expressions. In this context, Pontic dances served as crucial reference points for collective identity and as vehicles for preserving historical memory in displaced communities. It has been said among folklorists that the complexity and technical difficulty of Pontic dances reinforced the sense of cultural distinctiveness, thus functioning as a defining element of Pontic identity in new settlement environments following displacement. This comparative approach to the three dance traditions makes a significant contribution to understanding the various influences that have shaped modern Greek dance traditions. Concurrently, it establishes the methodological framework for identifying potential cultural crossings between regions, with a particular focus on possible convergences between Crete and Pontus, a central research question in this study. Through systematic documentation and analysis of selected dances from these three regions, this research represents an initial step toward

highlighting potential kinesiological “loans” that would document the dialectical relationship between different cultural traditions within the broader context of Greek cultural heritage.

The methodological approach adopted in this study combines regional comparison with detailed analysis of specific dance forms, providing a solid foundation for further research into the complex relationships between geographical separation, historical interaction, and cultural exchange as manifested in dance traditions. This framework enables the recognition of distinctive regional characteristics and the identification of shared elements that may indicate historical interconnections between seemingly disparate cultural groups.

2.13 Description of Dances Selected and Recorded for the Needs of the Present Research

2.13.1 Dances of Epirus

The dance tradition of Epirus is characterized by measured movements, collective participation, and expressive depth. These dances often serve as vehicles for community cohesion while allowing for individual expression within structured frameworks. The geographic isolation of many Epirotic communities has been identified as a contributing factor to the preservation of distinctive dance forms that reflect regional identity and social values. These dances have been shown to embody the historical memory of communities and constitute an intergenerational cultural dialogue that has persisted through centuries of social change.

I. Syrtos sta dyo (Deropolitissa/Trigona)

This widespread Epirotic dance, also known as “Pogonisios” or “Deropolitissa,” is considered²⁵¹ to be one of the foundational expressions of the region's dance tradition. It is performed in an open circle with several possible formations (double-

²⁵¹ Ilias S. Dimas. “Ελληνικοί παραδοσιακοί χοροί”. (Athens: Grafikes texnes Alekou Kalemi, 1993), pp 162

kagkelo, triple-kagkelo, or quadruple-kagkelo), featuring palm-to-palm hand positioning at chest height, which creates a unified dance structure. The name “Deropolitissa” derives specifically from the homonymous polyphonic song of the region, thereby demonstrating the intrinsic relationship between dance forms and vocal traditions in Epirotic culture.

A distinctive characteristic is the uniform movement pattern executed simultaneously by all participants, thereby emphasizing communal expression over individual display. Its cultural significance is evidenced by its function as a concluding dance in many Epirotic dance sequences, serving as an integrative element of regional dance practice. This dance embodies fundamental Epirotic aesthetic principles, including restraint, dignity, and collective harmony, reflecting broader social structures found in traditional rural communities²⁵².

II. Syrtos sta tria

The geographic distribution of this dance form is remarkable, with evidence of its presence across Epirus, Thessaly, and parts of Macedonia. Its structural simplicity likely contributed to its widespread adoption²⁵³, with the dance performed in a counterclockwise circular formation with palm-to-palm hand positioning and bent elbows, thereby maintaining cohesive group movement. The dance consists of six slow, deliberate walking steps that establish a measured, dignified progression through space.

The musical accompaniment exhibits interesting regional variations, with meters of 3/4, 2/4, or 4/4 depending on local tradition, reflecting the influence of local traditions on the dance. The dance's mixed-gender participation reflects traditional rural community structures where dance served as a mechanism for social integration. Morphologically, Syrtos sta tria features a straightforward kinetic structure that facilitates communal participation while still allowing subtle variations

²⁵² Fotios Mavrovouniotis. Alexandros Malkogeorgos, and Eirini Argyriadou. “Ελληνικοί Χοροί”. (Thessaloniki: Ekdotiki Aiginou, [2006]), pp 371-523.

²⁵³ Ilias S. Dimas. “Ελληνικοί παραδοσιακοί χοροί”. (Athens: Grafikes texnes Alekou Kalemi, 1993), pp 162.

that reflect regional dance aesthetics. The dance's historical continuity is evidenced by its persistent presence in community celebrations throughout northwestern Greece.

III. Zagorisios

Zagorisios represents a distinctive dance expression unique to Epirus, originating from the Zagori region. This robust dance incorporates theatrical elements that showcase the lead dancer's technical proficiency, with both men and women participating. Their hands are held at the wrists and bent elbows, providing structural support and cohesion. The mountainous topography of Zagori has contributed to the development of this distinctive dance form, with its vigorous character reflecting the physical robustness required for life in this challenging environment.

From a morphological perspective, the dance comprises 16 movements of varying duration, organized into four kinetic motifs, each consisting of four movements. From a musicological perspective, the dance's rhythmic structure is of particular interest, following a five-beat paeonic rhythmic pattern (5/4 meter with a 3/4 + 2/4 structure, or alternatively 5/8 with a 3/8 + 2/8 structure). However, alternative rhythmic interpretations, such as a 2+3 structure, have been proposed by scholars, highlighting the intricacies of traditional dance meter analysis.

A notable tension exists between the relatively fast musical tempo and the more moderate execution of the dance, creating a dynamic relationship between sound and movement. For instructional purposes, steps are typically counted in groups of four at a slower pace. This methodological approach enables the comprehension of the dance's complex structure while preserving its distinctive rhythmic character. The Zagorisios serves as a prime example of the intricate rhythmic structures that are hallmarks of the Epirotic dance tradition.²⁵⁴

²⁵⁴ Fotios Mavrovouniotis. Alexandros Malkogeorgos, and Eirini Argyriadou. *“Ελληνικοί Χοροί”*. (Thessaloniki: Ekdotiki Aiginiou, [2006]), pp 371-523.

IV. Perdikomata

This dance belongs to the broader “Tsamikos” category, which has a significant presence in the Epirotic tradition. It is performed as a slow circular dance in 6/8 rhythm, combining expressive qualities with technical complexity. The name “Perdikomata” refers metaphorically to the partridge's movements, reflecting the cultural practice of drawing dance imagery from the natural environment.

The structural organization consists of 19 steps, divided into three distinct segments: six steps to the right (counterclockwise), six steps to the left, and the remaining steps executed facing the circle's center. This complex structure allows the lead dancer to develop a personalized style through improvisational elements that demonstrate technical proficiency. The dance's asymmetrical structure creates opportunities for expressive diversity within a consistent framework, reflecting broader cultural values regarding individual expression within collective structures²⁵⁵.

V. Tsamiko of Konitsa

This regional variation of the more widely distributed Tsamiko dance originates from Konitsa in Epirus, where it is performed as a slow, circular dance characterized by solemnity and dignity. The dance reflects local identity and cultural pride, embodying historical narratives associated with resistance movements and warrior traditions. The elevated, proud movements of the dance symbolize concepts of freedom and courage that are central to the region's identity. The dance features a distinctive asymmetrical structure with 18 total steps: 12 of these are executed to the right (counterclockwise), while the remainder are performed in the opposite direction. This structural asymmetry contributes to the dance's expressive power and distinctive character. The prevalence of different regional variations of Tsamiko throughout Greece demonstrates the dialectical relationship between local particularity and broader cultural identity in Greek dance

²⁵⁵ Ibid.

tradition, illustrating how regional expressions contribute to national cultural heritage.²⁵⁶

2.13.2 Dances of Crete

Cretan dance tradition is characterized by a combination of dynamic expressiveness, technical complexity, and opportunities for individual display within collective structures. These dances frequently feature virtuosic elements that demonstrate physical prowess. The historical independence of Crete as a cultural entity, with its distinct musical instruments and performance practices, has contributed to the development of a dance tradition characterized by technical sophistication and expressive intensity.

I. Siganos

Siganos is a prime example of Cretan dance tradition, characterized by its measured tempo and ritualistic nature. Comprised of eight steps executed with deliberate, imposing movements, it engenders an atmosphere of ceremonial dignity. The dance's nomenclature itself alludes to its deliberate, measured tempo, underscoring the significance of controlled movement in Cretan aesthetic tradition. A distinctive attribute is its organic connection with the more dynamic Pentozalis dance. The Siganos frequently serves as an introductory sequence that transitions into the faster Pentozalis as musical tempo accelerates, thus representing a characteristic aesthetic element in Cretan dance tradition. This progression from measured to dynamic movement reflects a gradual intensification of emotional expression, demonstrating how Cretan dance forms function as integrated systems rather than isolated expressions.

The dance's symbolic dimension aligns with core Cretan cultural values, including prudence, self-restraint, and personal dignity. These values, in their embodiment, represent fundamental elements of traditional Cretan identity and social structure,

²⁵⁶ Ibid.

thereby demonstrating the function of dance as both a vehicle for cultural expression and a mechanism for the transmission of values.²⁵⁷

II. Syrtos Chaniotis

The syrtos chaniotis (or chaniotikos) is considered by many to be one of Crete's most emblematic dances. Its origins are in the Chania region, but its island-wide distribution serves to emphasise its importance as an element of pan-Cretan cultural identity. The dance serves as a significant bridge between local and broader cultural identities, demonstrating how regional expressions contribute to the collective heritage.

The dance is performed in a circular formation by mixed-gender participants, with the dancers' hands positioned in a clasped, palm-to-palm configuration with their elbows bent. This hand position creates a sense of both structural cohesion and expressive flexibility. Morphologically, the dance consists of 12 steps, counted in groups of three, and demonstrates an affinity with other pan-Hellenic dance forms, such as the Kalamatianos. This structural similarity suggests the presence of historical connections between regional dance traditions throughout Greece.

The 2/4 musical meter establishes a rhythmic foundation that facilitates both fluid movement and improvisational variations, particularly for the lead dancer. The characteristic W-shaped arm positioning with bent elbows creates a distinctive visual identity, serving to distinguish the dance while reinforcing its cultural significance as an embodied expression of Cretan identity.²⁵⁸

III. Maleviziotis

Maleviziotis (also known as Kastrinos) is considered by many to be one of the most emblematic dances of Crete, particularly in the Heraklion region (historically known as “Kastro”). Its primary appellation is derived from the Malevizi prefecture where it is believed to have first emerged, reflecting the historical significance of localized cultural evolution within the context of Cretan tradition. The presence of distinct

²⁵⁷ Ibid.

²⁵⁸ Ibid.

regional identities is widely regarded as a contributing factor to the cultural diversity for which the island is renowned.

The dance's distinctive features include rapid, jumping movements performed on the toes, which exemplify the dynamic and extroverted character of Cretan dance expression. The palm-to-palm hand positioning with bent elbows allows both collective cohesion and individual expression, reflecting the balance between group identity and personal distinction that characterizes much of the Cretan dance aesthetic. This balance also reflects broader cultural values regarding individuality within the community. The dance's morphological structure is particularly sophisticated, comprising 16 steps organized in variable spatial directions: 8 steps to the right (starting with the right foot), and 8 steps to the left (starting with the left foot). In addition, these same step patterns can be executed towards the center of the circle, backward towards its periphery, or in place to facilitate the lead dancer's virtuosic displays through turns, jumps, and "scissors" movements. This structural complexity creates exceptional opportunities for technical display while maintaining coherent group formation.

Classified as a "jumping" dance with a 2/4 rhythm, the Maleviziotis offers exceptional expressive possibilities and technical challenges, making it both popular and visually impressive. Its enduring cultural significance demonstrates the continuity of traditional forms within contemporary Cretan identity²⁵⁹.

IV. Prinianos of Eastern Crete

The Prinianos (or Priniotis) is a distinctive dance from Ierapetra province in Eastern Crete. This dance is performed as a circular, mixed-gender dance with a 2/4 musical meter, and is representative of the region's distinct cultural traditions. Eastern Crete has developed somewhat independently from western regions, resulting in distinctive dance expressions that enrich the island's cultural diversity. The dance exhibits significant regional variations, appearing in different forms across Ierapetra, Kroustas, Meseleri (where it is known as "Meselerianos"), and the Lasithi plateau (where it is referred to as "Priniotis"). This regional diversity

²⁵⁹ Ibid.

illustrates the dynamic nature of traditional dance, which adapts to local cultural conditions while maintaining fundamental structural elements.

Of particular scholarly interest is the Lasithi plateau variation, which researchers suggest bears significant similarities to the ancient Greek “Ormos” dance, indicating historical continuity within this dance tradition and suggesting the preservation of movement patterns across centuries of cultural development. The dance's morphological structure varies regionally. In the majority of Ierapetra villages, the dance is characterised by 13 steps (6 forward, 7 backward) with various hand positions, including crossed, shoulder-height with extended arms, palm-to-palm, and a position called thylikoti. In contrast, the Lasithi plateau version features 14 steps (7 forward, 7 backward) with double-crossed hand positioning. This structural and stylistic diversity demonstrates the adaptive capacity of traditional dance forms within changing cultural contexts²⁶⁰.

V. Pentozalis

Pentozalis is a dance that can be considered to be one of the most dynamic and technically impressive in Cretan tradition. It is performed as a fast, jumping dance with spectacular figures, and is practiced throughout Crete by both men and women, with hands positioned on adjacent dancers' shoulders. The collective formation creates a robust structure that supports the dance's energetic execution. The name derives from Cretan dialect terminology: “zala” signifies steps, and “Pentozalis” is derived from “pente zala” (five steps), reflecting the dance's five fundamental steps according to traditional Cretan counting methods. This linguistic connection underscores the integration of dance terminology with regional dialect, thereby reinforcing cultural specificity.

The dance's structural composition comprises two distinct sections: an introductory part, designated as “kontylies”, and a subsequent fast section. The slow section varies regionally, typically comprising 6 or 8 steps, and the fast section, which constitutes the dance's distinctive core, consists of 8 steps with energetic, dynamic

²⁶⁰ Ibid.

movements. This binary structure facilitates the gradual intensification of emotional expression, a characteristic aesthetic pattern in Cretan dance.

The dance may begin with either foot while maintaining identical step patterns in different sequences. Throughout the performance, dancers maintain a consistent orientation towards the center of the circle, thereby creating a unifying dynamic that reinforces both collective identity and the potential for individual expression. This delicate balance between personal display and group cohesion represents a fundamental principle of the traditional Cretan dance aesthetic²⁶¹.

2.13.3 Dances of Pontus

Pontic dance tradition is distinguished by its technical complexity, characterized by knee-bending movements and precise footwork. These dances often require considerable physical strength and endurance, reflecting the cultural values of discipline and resilience. The historical experience of Pontic Greeks, including displacement from their ancestral homeland, has contributed to the preservation of distinctive dance forms as expressions of cultural identity and collective memory.

I. Tik Diplo and Tik Tromakton

This dance represents a significant choreographic structure in the Pontic dance repertoire, performed universally across Pontic communities by both men and women.

The distinguishing morphological characteristic is the pronounced articulation at the knee joint – a flexion motion that gives rise to its nomenclature “Tik so gonaton” (knee bend). The choreographic composition comprises a decasyllabic kinetic pattern (10 steps).

The spatial configuration utilizes a proximal interpersonal arrangement, with a manual connection established at the palms, maintaining flexed elbows. The rhythmic framework is structured in either duple meter (2/4) or quintuple-octuple

²⁶¹ Ibid.

meter (5/8). Ethnochoreological research indicates the prevalence of this dance throughout the Pontus region, with the notable exception of the Matsouka district, where the Tik Mono variation predominates.

This is a faster form of the Tik dance, which is characterized by the performance of steps with small, sharp, quick movements. In its most elaborate form, the dance style requires the performer to shake or tremble their body, while extending their arms above their head and moving intensely from side to side. The choreographic structure remains consistent with that of the slow Tik, however, the fundamental kinetic motif undergoes modification and is substituted by three small, sharp steps or by one sharp step followed by a body shake. The rhythmic pattern of the melodies is characterized as heptasemic (7-count), whereas in the Tonia region, it is classified as disemic (2-count)²⁶².

II. Kotsari

The dance is performed by all Pontians, both men and women, with a hold from the shoulders. It is performed in the Kars region, located near the Caucasus in Russia, and it is from this region that the dance derives its name. The name is derived from “kots”, which means “heel”, or from “kos”, as the Pontians call the goat, a sacred animal of Dionysian worship. The dance is performed in eight steps, and in these steps, the breaking/bending at the knee is very pronounced. The dance is characterized by a 2/4 musical meter and is described as a mixed circular dance of the Greek Pontians of the Caucasus and one of the most popular dances of Pontus²⁶³.

III. Omal Trapezountas

The dance is performed by both men and women, with their hands held in a position between the palms and elbows. The dance originates from the Trebizond (Trapezountas) region and is now performed by all Pontians. It consists of 12

²⁶² Nikos Zournatdzidis. “Συμβολή στην έρευνα του Ποντιακού χορού: χορευτικές διαδικασίες και χοροί του πόντου”. (Athens: Choreftikos Omilos Pontion “Serra”, 2025).

²⁶³ Fotios Mavrovouniotis. Alexandros Malkogeorgos, and Eirini Argyriadou. “Ελληνικοί Χοροί”. (Thessaloniki: Ekdotiki Aiginou, [2006]), pp 371-523.

steps, which are divided into three sections, with four steps in each section. The dance is performed to a musical meter of 9/8²⁶⁴.

IV. Trygona

This dance, originating from the Trebizond region of Pontus, is performed by both men and women, who hold their hands in a downward position. It is characterized by eight distinct steps, with the initial four steps involving a left-facing movement, accompanied by arm movements that either bend at the elbows or stretch diagonally upwards. During these steps, the dancers' bodies are oriented towards the center of the circle, with a subtle inclination to the left. The subsequent four steps are performed in place, with the arms moving in a downward, back-and-forth motion (at steps 5 back, 6 forward, 7 back, 9 forward). During these steps, the body faces the center of the circle, while the head turns to the right. It is important to note that the dance always progresses to the left. The musical meter of the dance is 2/4.

It is further documented that Pontic dances are regarded as among the most challenging of all Greek folk dances, both in terms of rhythm and style. This complexity, coupled with the perception of the music as alien and monotonous by non-Pontians, contributes to their limited popularity. It is noteworthy that in their original form, most Pontic dances were performed in a closed-circle configuration. However, contemporary practice among younger Pontians involves line formation, likely influenced by performing groups that advocate for open line formation to enhance the audience experience. The musical accompaniment is invariably provided by the Pontic lyra, an instrument that affords a wide variety of musical possibilities for the Tik and the Omals²⁶⁵.

²⁶⁴ Nikos Zournatzidis. *“Συμβολή στην έρευνα του Ποντιακού χορού: χορευτικές διαδικασίες και χοροί του πόντου”*. (Athens: Choreftikos Omilos Pontion “Serra”, 2025).

²⁶⁵ Fotios Mavrovouniotis, Alexandros Malkogeorgos, and Eirini Argyriadou. *“Ελληνικοί Χοροί”*. (Thessaloniki: Ekdotiki Aiginiou, [2006]), pp 371-523.

V. Letsina

Letsina is a dance originating from the Kars region, performed at a rapid tempo and distinguished by its dynamic movements and the elevation of the soles of the feet above the ground, a distinctive feature of this region. This dance does not incorporate singing and can be performed with any musical instrument, including the clarinet. According to Georgoulis, Kougioumtzidis and Chrysanthos Theodoridis (eminent artists of the Pontic tradition hailing from Kars), the dance moves to the right, as noted by N. Zournatzidis²⁶⁶. The rhythm is heptasemic 7/8. The choreography consists of 16 steps performed in a closed circle by both men and women. The initial hand hold is from the palms with arms perpendicular to the ground, and with the body facing slightly left, dancers make six jumping steps to the left, starting with the right foot (which continuously leads the left). Then they take three steps backward and to the right along the imaginary perimeter of the circle where the dance moves, beginning with the right foot. The body is in a bent position, leaning with direction toward the left. The arms execute two swings, back and forth (right foot-arms back, left foot-arms forward, right foot-arms back, steps 7, 8, 9).

Subsequently, with the body rotated towards the center of the circle, dancers are to jump on the right foot, raising the arms upward, and “plant” the tip of the left foot in front of the right (step 10), step left foot back to the previous position (step 11), hop on the left foot and plant the tip of the right foot in front of the left (step 12). The right foot is then stepped back in place (step 13), and the left foot is hopped on while the tip of the right foot is planted in front of the left (step 14). The left foot is then stepped back in place on the imaginary perimeter of the circle (step 15), and the right foot is hopped on, and the tip of the left foot is planted in front of the right (step 16).

During the final steps, the upper body maintains stability while executing a circular motion from the waist downwards upon planting the tips of the feet in front. The formation adopts an open circle configuration with the hands positioned in a V-

²⁶⁶ Nikos Zournatzidis. “Συμβολή στην έρευνα του Ποντιακού χορού: χορευτικές διαδικασίες και χοροί του πόντου”. (Athens: Choreftikos Omilos Pontion “Serra”, 2025).

shape. Although the leader is positioned on the right, the dance moves in a leftward direction²⁶⁷.

Research Methodology and Experimental Setup

3.1 Motion Capture Technology

Motion capture technology represents a sophisticated method for quantifying the movement of objects or people. It enables researchers to translate real-world movements into digital kinetic data with such high precision that it allows for detailed analysis of human motion patterns. The use of the technology has a wider spectrum of applications, from biomechanical research and sports performance analysis to entertainment and culture. One wish regarding this paper is to prominently display it as a valuable resource for cultural preservation in the field of Greek dances.

The underlying principle of motion capture involves the tracking of the position and orientation of specific points on a subject's body over time. These tracking points are typically reflective markers, captured by specialized cameras that detect their positions in three-dimensional space. However, recent technological advancements are progressing towards markerless methods that employ artificial intelligence (e.g., Theia Markerless) to track movement without the use of physical markers. The resulting data provides a comprehensive digital representation of the subject's movements, which can then be exported and computer-aided analyzed.

3.1.1 MediaLab Equipment

The University of Vienna MediaLab is equipped with a Qualisys Motion Capture System²⁶⁸ for research in movement analysis. This system captures three-

²⁶⁷ Fotios Mavrovouniotis, Alexandros Malkogeorgos, and Eirini Argyriadou. “Ελληνικοί Χοροί”. (Thessaloniki: Ekdotiki Aiginou, [2006]), pp 371-523.

²⁶⁸ [Qualisys Motion Capture Manual](#)

dimensional kinematic data through a network of 14 infrared cameras operating at 100 Hz²⁶⁹. Each marker, set in a predefined space called “volume”, can be scanned with a precision of a few tenths of a millimeter, a fact that enables exceptionally detailed movement analysis.

The laboratory utilizes two complementary types of Qualisys cameras:

The motion capture setup utilized ten Miquis M3 cameras as the primary system, complemented by four Oqus 7+ cameras positioned in the far corners to provide additional precision where needed.

The Miquis M3 cameras feature 2-megapixel resolution (1824×1088 pixels) and deliver frame rates of 340-650 frames per second at full resolution. While their tracking distance is more limited, reaching up to 15 meters when using 16mm markers, their compact design, lightweight construction, and overall versatility make them well-suited for the requirements of this study.

The supplementary Oqus 7+ cameras offer substantially higher specifications with 12-megapixel resolution (4096×3072 pixels) and variable frame rates depending on resolution settings. When operating at full resolution with the 14mm markers used in this study, they can effectively track subjects from a distance of approximately 35 meters. Their optical quality and sensitivity provide enhanced accuracy in the peripheral areas of the capture volume. While these cameras would have been ideal for the entire system given sufficient resources, the precision level of the Miquis M3 cameras proved adequate for the study's objectives, with the Oqus 7+ cameras strategically placed to ensure coverage of the complete capture space.

This fourteen-camera arrangement has been designed in such a way that it creates a capture volume of approximately 20 square meters (4x5 meters). The cameras are strategically positioned at varying heights and angles around the performance area. They create intentionally overlapping fields of view, and so they ensure comprehensive coverage of the entire space. This configuration guarantees that

²⁶⁹ Ibid.

each marker is simultaneously visible to at least three cameras during movement, maintaining accurate tracking even when markers are partially obscured.

The reflective markers used consist of a spherical reflective surface mounted on a plastic base. Each marker features hook-and-loop material on its base, which adheres securely to the specialized motion capture suits.

3.1.2 The Qualisys System: Technical Operation and Capabilities

As previously mentioned, the Qualisys system employs optical tracking methods in order to digitize human movement. The system's operation can be broken down into several interconnected processes:

Calibration Protocol

Prior to data collection, a comprehensive two-stage calibration process is essential:

1. **Camera Calibration:** Done once during setup, this type of calibration establishes intrinsic parameters, including focal length, principal point, and lens distortion correction for each camera.
2. **System Calibration:** This process is done before every single recording session in order to calibrate the capture volume for maximum tracking precision. Using a specialized calibration wand with markers at precisely known distances, the system determines the extrinsic parameters (position and orientation) of each camera relative to a global reference frame.²⁷⁰

By detecting the markers on the calibration wand from multiple angles, the system calculates the precise position and orientation of each camera in relation to the capture space and to the other cameras. Through this procedure, each camera collects the spatial data needed by the Qualisys system to establish the camera

²⁷⁰ Ibid.

array's geometric configuration. Based on this calibration recording, the system also calculates the expected residual error for each individual camera as well as the total average error across all cameras, providing a quantitative measure of tracking accuracy throughout the capture volume.

Due to the system's precision, regular calibration is essential. Even slight changes in camera placement can significantly impact data quality. That is what makes consistent recalibration necessary for maintaining measurement accuracy.

Experimental Protocol and Marker Configuration

In our experiment, the Qualisys Animation Marker Set was employed, consisting of 42 reflective markers positioned on each one of the subjects. This standardized marker set includes specific placement points distributed across the whole body. In this way, they enable comprehensive full-body kinematic tracking and subsequent analysis.

The markers were attached to the specialized motion capture attire, as seen earlier, which ensured accurate placement and minimized movement during the performance. The 42-marker Qualisys configuration consists of the following markers:

Table 1: Reflective Markers Placement Description

Category	Marker	Description
Head	HeadTop	Crown of the head
	HeadFront	Forehead region
	HeadL	Left side of the head
	HeadR	Right side of the head
Torso & Spine	SpineTop	Upper thoracic region
	Chest* ²⁷¹	Sternum area
	Back*	Mid-back region
	WaistLFront	Left anterior waist
	WaistRFront	Right anterior waist

²⁷¹ Markers with an asterisk (*) indicate movable markers that may be adjusted to accommodate different needs.

Category	Marker	Description
Upper Limbs	WaistLBack	Posterior left waist region
	WaistRBack	Posterior right waist region
	L- and RShoulderTop / L- and RShoulderBack*	Shoulder markers
	LArm / RArm*	Upper arm markers
	LElbowOut / RElbowOut	Lateral elbow points
	LWristIn / RWristIn	Medial wrist markers
	LWristOut / RWristOut	Lateral wrist markers
Lower Limbs	LHandOut / RHandOut	Hand markers
	LThigh / RThigh*	Mid-thigh markers
	LKneeOut / RKneeOut	Lateral knee markers
	LShin / RShin*	Mid-shin markers
	LAnkleOut / RAnkleOut	Lateral ankle markers
	LHeelBack / RHeelBack	Posterior heel markers
	LForeFootIn / RForeFootIn	Medial forefoot markers
Virtual Markers	LForeFootOut / RForeFootOut	Lateral forefoot markers
	LToeTip / RToeTip	Toe markers
	Head Center	Derived from the four head markers, representing the central point of the cranium
	Torso Center	Calculated from the trunk markers, approximating the center of mass of the thorax
	Pelvis Center	Derived from the front and back waist markers, representing the center of the pelvic girdle
	Left Hand Center	Calculated from the left wrist and metacarpal markers
	Right Hand Center	Calculated from the right wrist and metacarpal markers
	Left Foot Center	Derived from the left ankle and toe markers
	Right Foot Center	Derived from the right ankle and toe markers

This marker set, as described in *Table 1*, allows for the detailed reconstruction of

segmental movements and joint rotations throughout the dance performances. The whole configuration clearly provides coverage of all major body parts:

- Cranial markers to track head movement
- Thoracic and sternal markers to capture trunk kinematics
- Upper limb markers positioned at the shoulders, elbows, wrists, and hands
- Pelvic markers that create the reference frame for lower-body movements
- Lower limb markers to track hip, knee, ankle, and foot movement

Beyond the physical markers, Qualisys offers the possibility to computationally create virtual markers. Therefore, as seen on the above table, seven computationally derived virtual markers were incorporated, representing the spatial centers of key body segments. These markers enable analyses of entire body parts and allow for more concise visualization of segmental movements during the dance performances:

1. **Head Center:** Derived from the four head markers, representing the central point of the cranium
2. **Torso Center:** Calculated from the trunk markers, approximating the center of mass of the thorax
3. **Pelvis Center:** Derived from the front and back waist markers, representing the center of the pelvic girdle
4. **Left Hand Center:** Calculated from the left wrist and metacarpal markers
5. **Right Hand Center:** Calculated from the right wrist and metacarpal markers
6. **Left Foot Center:** Derived from the left ankle and toe markers
7. **Right Foot Center:** Derived from the right ankle and toe markers

These virtual markers offer the chance to analyze general body movement patterns and coordination without necessitating the study of individual marker trajectories

The combination of physical and virtual markers provided a robust framework for capturing both the fine details of individual joint movements and the overall

coordination patterns that characterize traditional Greek dances, allowing for comprehensive kinematic analysis at multiple levels.

3.1.3 AIM Model Training Protocol

Once the markers have been placed on the subject, a so-called AIM (Automatic Identification of Markers) model must be created. The creation of the AIM model requires a systematic approach:

1. A complete motion capture sequence must be recorded using the standardized marker set
2. This sequence must include the full spectrum of movements to be analyzed in subsequent captures
3. The recording should begin with the subject in a T-pose position to identify markers more easily when creating the model
4. Following the initial pose, the subject must progress through the complete motion repertoire that the system will need to recognize

Once the system has established marker positions in three-dimensional space during the recording, it constructs continuous trajectories by connecting temporally sequential observations of each marker. Beyond tracking these individual trajectories, the Automatic Identification of Markers (AIM) functionality enables the system to automatically identify and distinguish the subject as a complete entity within the capture space based on the collective marker configuration.

3.1.4 Data Acquisition and Management

System integration is managed through the Qualisys Track Manager (QTM) software²⁷². It serves as the central platform for all the following:

²⁷² Qualisys AB. *Qualisys Track Manager (Version 2023)*. Gothenburg, Sweden: Qualisys AB. Retrieved from <https://www.qualisys.com/software/qualisys-track-manager/>

- System calibration and setup
- Real-time data acquisition
- Initial trajectory processing
- Data filtering and gap-filling
- Export to various formats for further analysis

QTM, depending on the size of the volume and the number of cameras, can simultaneously track up to 1,000 markers. Even complex experimental setups involving multiple subjects or detailed marker sets can be reliably covered.

3.1.5 Triangulation Process

The Qualisys system determines marker positions in three-dimensional space through a precise optical triangulation technique:

1. **Illumination:** The cameras emit infrared light that reflects off retroreflective markers, returning light in all directions.
2. **Marker Detection:** The system identifies these bright reflections against the darker background and calculates their centers using computer vision algorithms.
3. **Intersection Calculation:** When the same marker is detected by multiple cameras simultaneously, the system combines the two-dimensional position data from each camera's perspective to calculate the marker's true three-dimensional coordinates. Due to practical limitations, the observations from different cameras may not align perfectly. Therefore, the system employs a least-squares minimization approach to determine the optimal three-dimensional position that best fits all camera observations, effectively distributing measurement error across the data.

3.1.6 Data Cleaning: Managing Gaps and Ghosts

Since trajectory gaps, meaning segments where marker data is missing, can commonly occur due to either incomplete trajectory identification within the QTM software or physical obstructions of markers during data collection, a method of dealing with them is mandatory. The Qualisys system offers several methods to address these gaps. These include interpolation techniques such as polynomial filling, which creates smooth transitions when data exists on both sides of the gap, and linear filling, which connects existing points directly. For stationary objects or when surrounding data is unavailable, static filling applies fixed coordinates throughout the gap. More complex methods include relational filling based on surrounding marker patterns, virtual filling for empty trajectories, and kinematic filling, which maintains biomechanical relationships in skeletal models. For the traditional dance movements analyzed in this study, the research primarily implemented the polynomial filling method, as it was suitable to best preserve the natural flow of the choreographic sequences while maintaining data integrity.

3.2 Data Collection Protocol

3.2.1 Subject Selection Criteria

For the current experiment, participants were carefully selected based on several crucial criteria. In order to ensure the quality and, as far as possible, the authenticity of the dance recordings. All participants possessed a minimum of 15 years of dance experience, providing them with substantial embodied knowledge of the traditional forms. Except for the dancing experience, all subjects also had teaching experience. It is essential, though, to note at this point that teaching was not their primary occupation and, consequently, not their main source of income. In all cases, dance instruction represented either supplementary employment or volunteer work undertaken by our participants out of a passion for preserving cultural traditions.

Another important selection criterion was the extensive participation in educational seminars. All subjects have attended numerous specialized workshops focused on deepening their understanding of the dances and traditions, most importantly of the regions recorded. This ongoing educational commitment demonstrates their dedication to authentic representation and continuous improvement, and deepening of their knowledge of Greek tradition.

3.2.2 Discussion of “Professional” Status in Greek Traditional Dance Context

A lot of thought has gone into the definition of professionalism in the context of the Greek tradition, as well as its extent to the dance and the dancers. So, considering the participants' professional status, it becomes necessary to examine what professionalism entails in the context of traditional Greek dance. The Cambridge Dictionary provides two relevant definitions of “professional”: 1) “*relating to work that requires specialized training or education*”, and 2) “*describing someone who engages professionally in an activity that others typically pursue as a hobby*”.²⁷³

Taking these definitions into account, one can easily identify two fundamental pillars that underpin professionalism: in-depth knowledge of the subject matter and the activity in question being the primary source of income. In the research context, classifying participants as strictly “professional” proved challenging. And that is precisely due to the absence of one of these two essential characteristics. While all participants possessed a profound knowledge of the regions documented, dance did not constitute their primary means of subsistence.

This is the reason why it has been considered most appropriate to characterize the participants as “semi-professionals”. This designation accurately reflects, on the one hand, their professional-level expertise while avoiding, on the other hand, the potentially misleading implication that dance represents their principal occupation. This particular distinction is important in the traditional dance world, where many

²⁷³ [Cambridge Dictionary](#)

knowledgeable practitioners often maintain separate careers while dedicating significant time to dance preservation and education.

3.2.3 Number of Participants

Seven semi-professional dancers participated in our study. Each one was outfitted with 42 reflective markers, based on the Qualisys Marker Set, as discussed earlier, to enable precise motion capture. As an innovative methodological approach, the recordings captured sessions with two or three dancers performing together rather than individual performances. This collaborative recording format better represents the communal nature of Greek dance culture. Since dances are part of a collective social experience, they are rarely performed in isolation. While dancers were recorded simultaneously, data analysis can, of course, also be conducted for each individual performer separately.

The resulting dataset is quite comprehensive. It consists of 14 versions of each individual dance, yielding a total of 210 recordings (7 participants performed 2 versions of each dance, resulting in 14 recordings per dance. As the study included 15 dances, a total of $14 \times 15 = 210$ recordings were obtained). This substantial collection allowed us to conduct an initial comparative analysis across performers, tempos, as well as contextual variations. The volume of data collected due to the extended 1-minute recording window also provides sufficient redundancy, allowing us to handle potential technical issues in individual recordings while still maintaining a statistically significant sample needed for the analysis. This sample was narrowed to 30 seconds and was selected based on one fundamental criterion: the completion of at least one complete dance cycle, which means the entire dance pattern was completed within this time frame. This methodological decision ensures complete movement sequences necessary for comprehensive analysis. Of course, based on the length of each dance pattern, in some cases, the cycle was completed multiple times within the 30-second window, while in other cases, much fewer times or even just once.

3.2.4 Audio Recording Process and Audio Synchronization

Without it being absolutely necessary, a field recorder has been utilized, in order to capture also the synchronous audio components, meaning the music pieces that were used during the recording.

Since it was important to ensure precise synchronization between the motion capture data and the audio recordings, a simple yet effective clapping technique was employed. One participant, at the beginning of each dance recording, executed a distinct double handclap that served as a synchronization marker for post-processing. This audio cue allowed for accurately aligning the motion data with the musical accompaniment, ensuring the production of enhancing video files used for illustration purposes.

In cases where there was the need to interrupt and restart a recording due to technical issues or performance errors, a triple handclap was instituted instead. This systematic approach allowed us to effortlessly identify the definitive versions for analysis among the corrupted recordings during post-processing.

3.2.5 Distinction Between Slow and Fast Dances

The experiment protocol called for recording not only one example of each dance but two different versions of it and, in fact, at varying tempos. To categorize these performances as slow or fast, what was measured was the number of completed dance-pattern cycles in a one-minute recording window, dances with fewer than 10 cycles per minute (roughly ≤ 60 BPM) were labeled “slow,” while those with more than 20 cycles per minute (roughly ≥ 120 BPM) were labeled “fast”. This methodological decision was based on the understanding that traditional dances often exist in both slower, more deliberate forms and faster, more energetic variations. By capturing these different temporal expressions, the goal was to examine how tempo affects movement quality, step execution, and bodily expression, in case a connection exists.

This approach enabled us to investigate whether tempo changes (e.g., accelerations from slow to fast sections) correspond to alterations in movement

quality, such as more abrupt transitions, increased energy expenditure, or modified step patterns.

3.2.6 Laboratory Performance Area Setup

The laboratory environment required only some minimal adaptation from its standard configuration to accommodate our Greek dance recordings. The most significant adjustment that should be noted here concerns the usable tracking space. Since the motion capture system was capable of monitoring a predefined volume, it was ensured, dancers would stay inside the volume, so as not to lose any data. We rather implemented a strategic constraint in order to ensure the optimal data quality. Because one must keep in mind that in all the recordings, multiple dancers were documented simultaneously.

One particular concern, given that two or three subjects were performing circular dances, was to prevent marker occlusion and minimize tracking gaps. The capture volume provided a performance area of approximately 20 m², which was fully utilized during recordings. To ensure dancers remained within this trackable space, floor markings were placed roughly 50 centimeters inside the actual volume boundaries, serving as visual cues for movement. These markings ensured that even extended arm positions remained within the cameras' tracking range while allowing dancers to make full use of the available performance area.

The field recorder used for audio capture was positioned in close proximity to the performance area, yet outside the camera tracking zone. The proximity allowed for clear audio recording of the synchronization claps while avoiding any interference (e.g., the creation of “ghost” markers) with the motion capture system's infrared tracking.

This modest but purposeful adaptation of the laboratory environment strikes a balance, to the extent possible, between the technical requirements on the one hand and the spatial needs of traditional Greek dance performance on the other.

The purpose was to create the ideal conditions for high-quality data collection while accommodating the communal nature of the dances being studied.

3.3 Methodological Limitations

3.3.1 Costume Considerations and Potential Impact on Data

As discussed earlier, the motion capture process required participants to wear specific costumes. Those need to be tightly fitted so that they ensure accurate marker tracking. The main reason why they need to be so tight is to prevent fabric movement that could cause markers to shift from their calibrated positions. Since system calibration occurs at the beginning of each recording session, it is of great importance that markers remain precisely positioned throughout the entire recording process to maintain data integrity. The system, though, allows for flexibility in refining the model. Additional training sessions can be applied if tracking quality requires improvement, and portions of the actual recorded data can be incorporated to further enhance model accuracy, ensuring optimal tracking performance throughout the study.

These necessary constraints on clothing, of course, presented certain limitations to the participants. The tightly fitted costumes inevitably restricted movement to some degree. They particularly affected dances that require intense or expansive motions of the legs, torso, and arms. The contrast between the freedom provided by traditional loose-fitting clothes and the constraints of motion capture suits is significant, which is why it must be acknowledged as a limitation and potential influence on our acquired dataset.

During the recordings, there have been observed cases where dances or specific movements could not be executed with the full kinetic energy typically required by a dance or a region. This resulted in occasionally more restrained expressions

than what would be expected or demanded by the dance style or regional character. While these adaptations were minimal, they represent a compromise between technical requirements and the authenticity of performance.

3.3.2 Spatial Limitations and Impact on Movement Range

Despite having an adequate recording volume, the defined boundaries of our recording space imposed certain minimal restrictions on movement expression.

These spatial constraints were particularly noticeable given the fact that our recordings involved two or three dancers simultaneously. Traditional Greek dances in some cases incorporate expansive movements and complex spatial patterns that would naturally utilize more extensive areas in authentic settings. Dancers, throughout the recordings, had to remain conscious of those spatial boundaries. So, we can reasonably assume they have subtly influenced their movement quality and expressive range.

Furthermore, one must not forget that the communal nature of these dances typically involves larger groups of participants who together create the full spatial dynamic of the dance. Our limited number of participants necessarily altered this aspect of the traditional dance experience.

3.3.3 Regional Variation Challenges

One of the most significant methodological challenges we faced, and we had to deal with, stemmed from the pronounced regional dance variations that characterize Greek traditional dance. Even between closely neighboring villages, dance styles can exhibit significant differences in execution (or even style and character, when working in different regions). This diversity complicated our

selection process. We needed to choose dances that would most effectively represent the general character of each broader region.

This variation also created minor challenges among our participants. Each dancer's interpretation of a particular dance was inevitably influenced by their specific learning context, where and by whom they had learned a dance, and which village's style they were emulating. These subtle differences in interpretation highlight, in the best possible way, the complex nature of documenting and comparing traditional dance forms that exist as living, varied traditions rather than standardized choreographies.

3.3.4 Ideal versus Actual Regional Representation. The Choice of the Dancers

The ideal methodological approach would have involved, of course, native dancers from each specific region, who would then perform only the dances indigenous to their communities. Such participants would have learned these dances through direct cultural transmission at local festivals (“panegyria”) and community gatherings rather than through formal instruction. This approach would have maximized authenticity and cultural fidelity in our recordings.

Unfortunately, practical constraints made this ideal scenario unfeasible. Financial limitations as well as time constraints, and logistical challenges of bringing dancers from Greece to Vienna for recording sessions necessitated a compromise. Instead, we worked with highly qualified semi-professional dancers, exceptionally knowledgeable about the regional styles. One must, however, take into consideration that in some cases, the embodied knowledge of lifelong dancers from a specific region cannot be fully replicated by someone non-indigenous to the region in question.

The above limitations highlight the inevitable compromises required when adapting traditional cultural expressions to laboratory-based motion capture measurement, particularly when those traditions originate from regions distant from the research facility. While the study's main objective is movement analysis rather than ethnographic documentation, the constraints nevertheless affect the authenticity of the recorded performances.

Statistical Analysis and Results

The current chapter presents the statistical analysis of the motion capture data, examining if and to what extent movement characteristics vary across regional dance traditions, musical parameters, and individual performers. The analysis employs a hierarchical approach, beginning with examinations of regional differences in four primary kinematic metrics (fluidity and complexity²⁷⁴, velocity and acceleration. Further information on chapter 4.1.3), followed by investigations of musical influences (tempo and meter effects). It concludes with assessments of measurement reliability and inter-performer variation. Both parametric and non-parametric statistical methods are utilized to ensure robust conclusions despite some violations of statistical assumptions in certain subsets of the data (e.g., p-values were often well below 0.05, at the Shapiro–Wilk hand/foot velocities by region).

²⁷⁴ Birgitta, Burger, and Petri Toiviainen. *MoCap Toolbox – A Matlab Toolbox for Computational Analysis of Movement Data*, in *Proceedings of the 10th Sound and Music Computing Conference* (Stockholm: KTH Royal Institute of Technology, 2013)

4.1 Data Processing Pipeline - Architecture and Configuration

The analysis pipeline was designed as a comprehensive system for processing, storing, and analyzing motion capture data from traditional Greek dance performances. The pipeline consists of several interconnected stages, each serving a specific purpose in transforming raw motion data into meaningful kinematic metrics and statistical insights.

The pipeline begins with the establishment of a robust computational environment. While the initial setup imports parallel processing capabilities, the implementation employs sequential processing with thread-safe database operations. Thread safety was ensured through the implementation of database locks as a means of preventing data corruption during database write operations. The system was configured with customizable parameters, including file paths, database locations, and processing options stored as global constants.

An SQLite database with Write-Ahead Logging (WAL) mode served as the central data repository. This configuration was chosen for its ability to handle concurrent reads while maintaining data integrity during bulk insertions. The database schema consisted of three primary tables: a *recordings* table containing metadata for each dance performance, a *mocap_data* table storing processed velocity and distance measurements, and a *raw_marker_data* table containing 3D positional coordinates.

The pipeline processed files iteratively, with comprehensive logging at the INFO level to track progress and identify any processing issues. This sequential approach, while potentially slower than parallel processing, ensured predictable execution order and simplified debugging of data transformation steps.

4.1.1 Data Ingestion and Preprocessing

The data ingestion phase processed two distinct file formats through separate but complementary pipelines.

TSV File Processing:

Tab-separated value files containing velocity and distance measurements underwent systematic parsing. The pipeline employed regular expression matching to deconstruct filenames into structured components: region codes, dance numbers, version identifiers, session letters, and measurement types (velocity or distance traveled). Each file's six-line header was parsed to extract critical metadata, including frame count, sampling frequency, and recording timestamps.

The data transformation process converted wide-format measurements into normalized long format through pandas melt operations. Each marker-measurement combination (e.g., "D1_HeadTop_vel") was decomposed into separate fields for dancer name (e.g., "D1"), marker name (e.g., "HeadTop"), and measurement type (e.g., "vel" for velocity). This normalization facilitated efficient database storage and enabled flexible querying patterns.

MAT File Processing:

MATLAB files containing raw 3D positional data required a different processing approach. The pipeline extracted labeled trajectory data from the hierarchical MATLAB structure, identifying marker labels and their corresponding 3D coordinate time series. Homogeneous coordinates were detected and removed when present, ensuring consistent 3-dimensional data representation.

For each marker trajectory, the pipeline parsed composite labels to identify dancer-marker pairs and extracted frame-by-frame positional data. These data were then inserted into the *raw_marker_data* table using optimized transaction batching, in an attempt to minimize insertion time.

A critical challenge involved reconciling different recording identification schemes between TSV and MAT files. The pipeline implemented a canonicalization function that mapped MAT file identifiers (e.g., “C11a”, the name of the region, followed by the number of the recording, the number of the dance, and the version of the dance) to their corresponding TSV file identifiers (e.g., “C_1-1_a_vel”). This mapping ensured that positional and velocity or distance_traveled data from the same recording could be properly linked for integrated analyses.

4.1.2 Quality Control and Data Enrichment

Following initial data loading, the pipeline executed comprehensive quality control procedures. These included systematic null value analysis across all database columns, with results aggregated into summary tables showing missing data patterns by column and table. The pipeline also performed data distribution checks and generated descriptive statistics for all numeric fields.

The data enrichment phase added derived metadata to support subsequent analyses. Anonymous subject identifiers were systematically assigned to maintain participant privacy while enabling individual-level tracking across sessions. Gender coding was incorporated based on predetermined mappings, with special handling for known participants. This addition ensured that demographic factors could be properly controlled and examined as independent variables in statistical analyses.

4.1.3 Kinematic Metric Computation

The pipeline computed two primary kinematic metrics that captured different aspects of dance movement:

- I. Fluidity Calculation

Fluidity quantified movement smoothness through a multi-step process:

1. Mean velocity was computed for each dancer at each time point by averaging across all tracked markers
2. Acceleration was derived as the time derivative of mean velocity
3. For each dancer-recording pair, aggregate statistics were calculated:

Average velocity: the mean of all instantaneous mean velocities

Mean absolute acceleration: average of absolute acceleration values

4. Fluidity has been defined by Burger & Toiviainen as the ratio: average velocity / mean absolute acceleration²⁷⁵

This metric provided a dimensionless measure of movement smoothness, with higher values indicating more fluid, controlled motion.

II. Complexity Analysis

Movement complexity was quantified using Principal Component Analysis on positional data:

1. For each dancer-recording pair, a wide-format matrix was constructed with frames as rows and marker-coordinate combinations as columns
2. PCA was applied to the cleaned matrix, extracting explained variance ratios
3. Normalized Shannon entropy was calculated: $-\sum(v_i \times \log(v_i)) / \log(N)$, where v_i represents variance ratios and N is the number of components

This entropy-based measure captured how movement was distributed across principal components, with higher values indicating more complex, multidimensional movement patterns.

²⁷⁵ Ibid

4.1.4 Virtual Marker Computation

To enable anatomically meaningful comparisons, the pipeline computed virtual markers representing key body segments. Center markers for hands and feet were calculated by averaging the positions of relevant physical markers. These virtual markers were stored in a separate table, *virtual_mocap_data*, with the same structure as the primary motion capture data, enabling seamless integration in downstream analyses.

4.1.5 Descriptive Statistics and Visualization

The pipeline generated comprehensive descriptive statistics and visualizations to characterize the dataset:

- Distribution histograms for velocity and distance measurements, revealing the typical ranges and patterns of movement
- Boxplots comparing measurements across dancers, with automatic guards against insufficient group sizes
- Summary tables showing mean values by dancer and measurement type
- Regional breakdowns of recording counts and characteristics

These exploratory analyses provided crucial insights into data quality and guided the selection of appropriate statistical tests.

4.1.6 Statistical Analysis Framework

A hierarchical statistical testing framework has been implemented:

I. Assumption Verification

Prior to parametric tests, the pipeline automatically verified:

1. Normality of distributions using the Shapiro-Wilk tests
2. Homogeneity of variance using Levene's test
3. Sufficient sample sizes for reliable inference

II. Hypothesis Testing

And multiple statistical comparisons have been conducted:

1. Regional Comparisons: One-way ANOVAs tested for differences in hand velocity, foot velocity, fluidity, and average velocity across regions (Crete, Epirus, Pontos).
2. Musical Characteristics: T-tests compared metrics between:
 - a. Even versus odd meter dances,
 - b. Slow versus fast tempo performances.
3. Individual Differences: ANOVAs assessed dancer-specific variations in movement patterns.
4. Version Comparisons: T-tests compared metrics between different versions of the same dance.

Effect sizes (Cohen's d) were calculated for all t-tests to quantify the practical significance of observed differences.

4.1.7 Results Aggregation and Export

The final stage of the pipeline aggregated all computed metrics into a unified *metrics* table containing:

- Overall fluidity and complexity scores for each dancer-recording pair
- Links to recording metadata (region, meter, tempo)
- Demographic information (sex, anonymous subject IDs)
- Derived virtual marker statistics

This denormalized structure optimized query performance for statistical analyses and report generation. The pipeline included transaction management and error recovery mechanisms to ensure data consistency throughout the multi-stage processing workflow.

4.1.8 Software and Statistical Tools

All data processing, analysis, and visualization were conducted using Python 3.13x²⁷⁶. The motion capture pipeline and statistical analyses utilized the following packages:

Data Management, Processing and Analysis:

sqlite3²⁷⁷ (Python standard library) for database management

pandas²⁷⁸ for data manipulation and analysis

numpy²⁷⁹ for numerical computing

scipy²⁸⁰ for reading MATLAB format files (scipy.io) and statistical functions

scipy.stats²⁸¹ for normality testing (Shapiro-Wilk test), homogeneity of variance testing (Levene's test), and entropy calculations

scikit-learn²⁸² and sklearn.decomposition.PCA used for Principal Component Analysis and complexity calculations

Statistical Testing:

²⁷⁶ Python.org

²⁷⁷ Python Software Foundation. *sqlite3 — DB-API 2.0 interface for SQLite databases*. In *Python 3.13 Standard Library Documentation*. Retrieved August 2025, from <https://docs.python.org/3/library/sqlite3.html>

²⁷⁸ The pandas development team. *pandas: Python data analysis library* (Version 2.3.3). Retrieved from <https://pandas.pydata.org/>

²⁷⁹ NumPy Developers. *NumPy documentation* (Version 2.3). Retrieved October 19, 2025, from <https://numpy.org/doc/stable/>

²⁸⁰ SciPy Developers. *SciPy tutorial* (Version 1.16.2). Retrieved October 19, 2025, from <https://docs.scipy.org/doc/scipy/tutorial/>

²⁸¹ Ibid.

²⁸² scikit-learn Developers. *scikit-learn documentation* (Version 1.7.2). Retrieved October 19, 2025, from <https://scikit-learn.org/stable/>

`statsmodels`²⁸³, `statsmodels.formula.api.ols`, `statsmodels.stats.oneway` for ANOVA

`statsmodels.stats.multicomp.MultiComparison`, and `statsmodels.api` for general statistical modeling

Visualization:

`seaborn`²⁸⁴ for statistical graphics

`plotly`²⁸⁵ for interactive visualizations

Utility Libraries:

`pathlib` (Python standard library) for file path management

`re` (Python standard library) for filename parsing

`logging` (Python standard library) for process tracking

4.2 Regional Variations in Movement Characteristics

At that point, it is important to acknowledge that all references to 'Epirus', 'Crete', and 'Pontos', in this analysis, are used to denote specifically the dances from these regions that have been recorded for the study. These references do not represent an exhaustive overview of all dance traditions from these areas.

4.2.1 Movement Fluidity

The analysis of movement fluidity revealed highly significant regional differences ($F = 104.66$, $p < 0.001$). As illustrated in the violin plot distributions (see Figure I),

²⁸³ Seabold, Skipper, and Josef Perktold. "[statsmodels: Econometric and statistical modeling with python](#)." Proceedings of the 9th Python in Science Conference, 2010.

²⁸⁴ Michael, Waskom. *seaborn: Statistical data visualization (Version 0.13.2)*, 2021. Retrieved October 19, 2025, from <https://seaborn.pydata.org/>

²⁸⁵ Plotly Developers. *Plotly for Python documentation (Version 6.3.0)*. Retrieved October 19, 2025, from <https://plotly.com/python>

Epirus demonstrated the highest mean fluidity ($M = 0.497$, $SD = 0.055$), followed by Crete ($M = 0.358$, $SD = 0.135$) and Pontos ($M = 0.262$, $SD = 0.082$). The violin plot visualization reveals additional nuances in the distribution patterns. Epirus's violin shape is notably tall and narrow, indicating not just high fluidity but exceptional consistency in execution, with values tightly clustered around 0.45-0.55. This contrasts sharply with Crete's wider distribution spanning approximately 0.20-0.60, suggesting diverse stylistic interpretations even within individual performances. The Pontos distribution, centered at lower values of 0.15-0.40, shows intermediate variability.



Figure I: Fluidity by Region – Violin Plot

Post-hoc comparisons confirmed that all pairwise regional differences were statistically significant. The bar plot with 95% confidence (see Figure II) intervals demonstrates non-overlapping error bars between all three regions, reinforcing the robustness of these differences. The bar-and-dot plot presentation provides additional clarity through the overlaid individual dancer points, revealing that the regional differences persist at the personal level with minimal within-region scatter. Notably, Epirus exhibits both higher fluidity and greater consistency in execution,

aligning with ethnographic descriptions of the region's emphasis on controlled and dignified movement patterns.

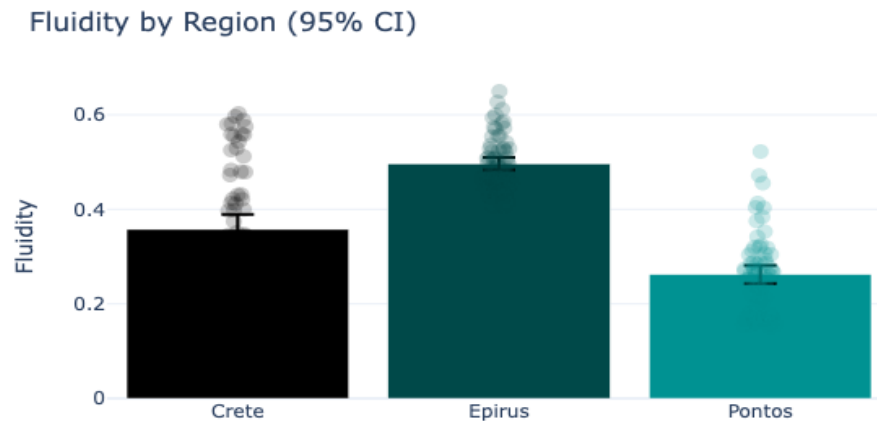


Figure II: Fluidity by Region – 95% CI

4.2.2 Movement Complexity

Regional analysis of movement complexity, measured through entropy calculations, revealed significant differences. Welch's ANOVA ($F = 3.16$, $p = 0.046$) was used, due to heterogeneous variances. However, the non-parametric Kruskal-Wallis test did not reach significance ($H = 2.68$, $p = 0.259$). That is likely due to lower power and reduced sensitivity to distribution tails. The raincloud plot (see Figure III) illustrates that Crete exhibited both the highest median complexity and the widest distribution, with outliers reaching entropy values of 0.37. In contrast,

Epirus and Pontos showed tightly clustered distributions centered around 0.12-0.15.

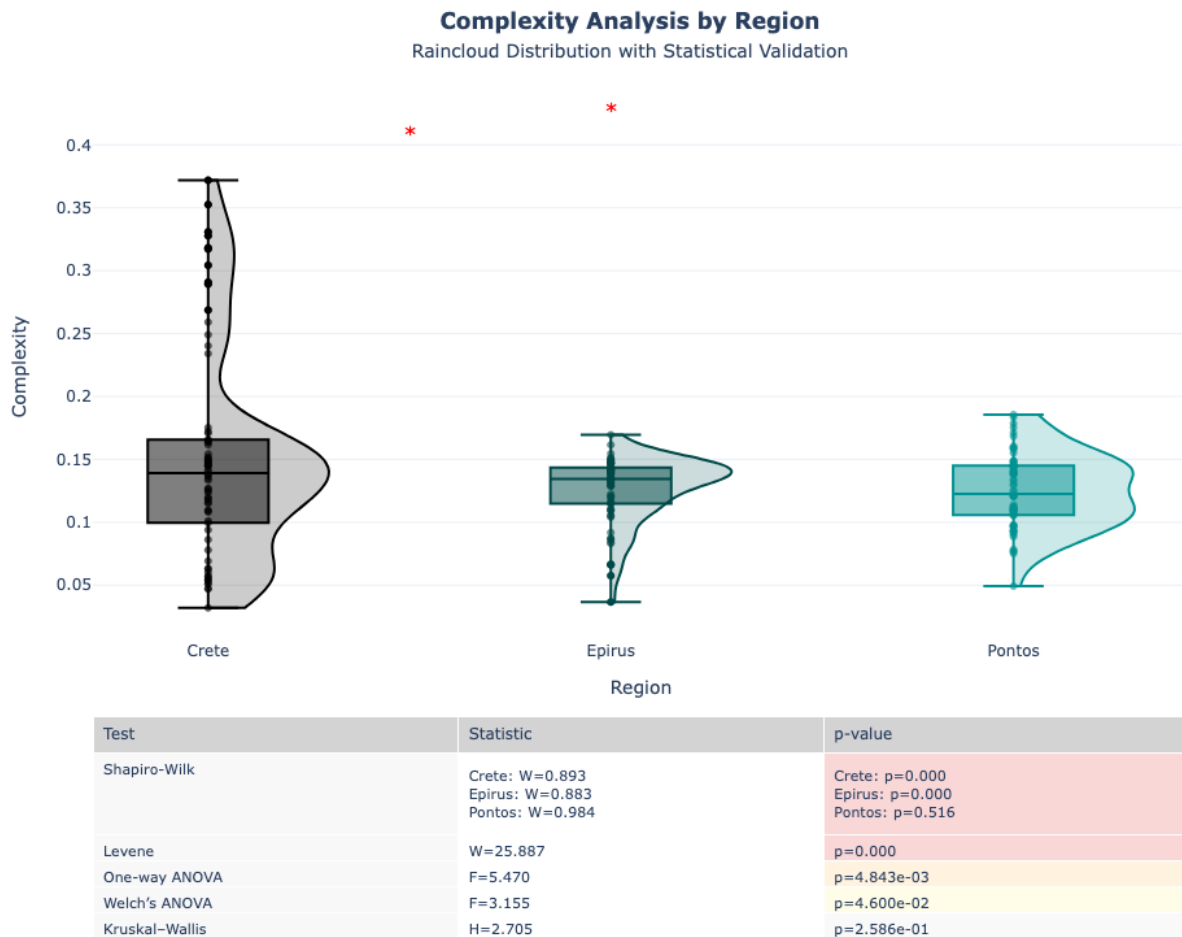


Figure III: Complexity Analysis by Region – Raincloud Plot

The complexity analysis benefits from multiple visualization approaches. The simplified violin plot (see Figure IV) provides a cleaner view that underscores Crete's uniquely broad complexity spectrum, with values ranging from 0.05 to 0.32.



Figure IV: Complexity by Region – Violin Plot

4.2.3 Velocity Patterns

Analysis of average velocity across regions revealed significant differences ($F = 55.32$, $p < 0.001$). Crete and Pontos demonstrated comparable mean velocities (approximately 490-510 mm/s), while Epirus showed significantly lower values ($M \approx 350$ mm/s). The violin plot visualization (see Figure V) confirms that Epirus maintains consistently lower velocities with minimal variation, while Crete and Pontos exhibit broader distributions extending to higher velocity ranges. The shape of the plot reveals that while Crete and Pontos share similar median overall velocities, Crete's distribution tail extends notably higher (up to ~ 950 mm/s), indicating a greater range of tempo variations within dances.



Figure V: Average Velocity by Region – Violin Plot (mm/s)

Further decomposition into hand and foot velocities revealed distinct regional movement characteristics:

Hand Velocity: Pontos demonstrated quite higher hand velocities ($M = 884.23$, $SD = 521.10$) compared to Crete ($M = 615.86$, $SD = 194.38$) and Epirus ($M = 423.39$, $SD = 108.73$). The violin plot (see Figure VI) shows Pontos reaching extreme values exceeding 1800 mm/s, consistent with the region's tradition of expressive arm movements and elevated hand positions. Both standard ANOVA ($F = 35.03$, $p < 0.001$) and non-parametric Kruskal-Wallis tests ($H = 45.55$, $p < 0.001$) confirmed these differences.



Figure VI: Hand Velocity by Region – Violin Plot (mm/s)

Foot Velocity: Crete, on the contrary, exhibited the highest foot velocities ($M = 671.17$, $SD = 232.25$), significantly exceeding both Epirus ($M = 335.71$, $SD = 89.50$) and Pontos ($M = 405.36$, $SD = 127.53$). The ANOVA (see Figure VII) revealed an even stronger effect ($F = 84.14$, $p < 0.001$). The foot velocity analysis provides compelling visual evidence of regional specialization. Even with a floor of 200 mm/s in the y-axis, Crete's distribution extends to extreme values approaching 1,150 mm/s, with the median centered at 650-700 mm/s. This tale of high values suggests that Cretan dance steps include explosive movements or rapid sequences that distinguish it from Pontos (median 250-500 mm/s) and Epirus (200-350 mm/s). While Cretan dances emphasize dynamic steps and weight transfers, Epirus prioritizes stability in posture and controlled steps.



Figure VII: Foot Velocity by Region (mm/s)

4.2.4 Regional Movement Signatures

The expanded parallel coordinates plot (see Figure VIII) synthesizes these findings into distinct regional movement profiles across six dimensions (average velocity, mean absolute acceleration, fluidity, complexity, hand velocity, and foot velocity). The application of parallel coordinates reveals precise patterns: Crete's performance metrics typically show high values in terms of foot velocity and complexity, while maintaining intermediate levels in hand velocity and fluidity.

Epirus's lines consistently cluster at low levels across all velocity measures but peak at fluidity. Pontos shows the most distinctive spike in hand velocity while maintaining moderate values elsewhere. Each region exhibits its own characteristic signature:

- **Crete:** High foot velocity, moderate hand velocity, variable fluidity, and elevated complexity
- **Epirus:** Low velocities across all measures, exceptionally high fluidity, and constrained complexity
- **Pontos:** Even higher hand velocity, moderate foot velocity, low fluidity, and moderate complexity

The dense parallel coordinates visualization (see Figure VIII) validates the regional profiles at the individual-recording level, demonstrating that the three regional clusters occupy distinct volumes in the six-dimensional metric space. This granular view confirms that regional signatures remain separable even when examining individual performances, underscoring the robustness of the six-metric classification approach.

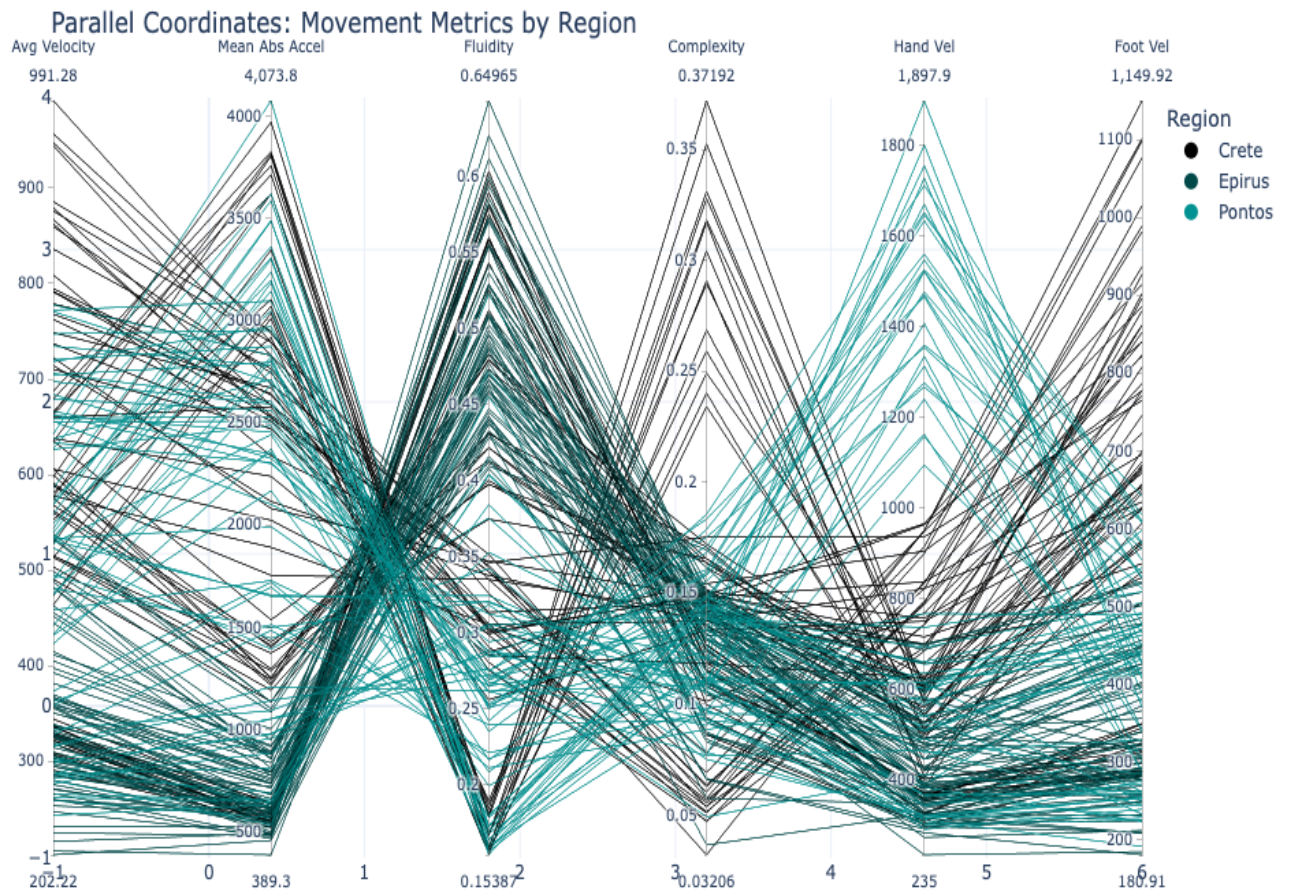


Figure VIII: Parallel Coordinates - Movement Metrics by Region

4.3 Musical Influences on Movement

4.3.1 Tempo Effects

Tempo emerged as the strongest predictor of movement fluidity. Comparison between slow and fast tempos revealed a massive effect ($t = 17.10$, $p < 0.001$), with slow tempos producing a mean fluidity of 0.460 compared to 0.246 for fast

tempos. The violin plot (see Figure IX) comparison depicts this important difference, with virtually no overlap between distributions.

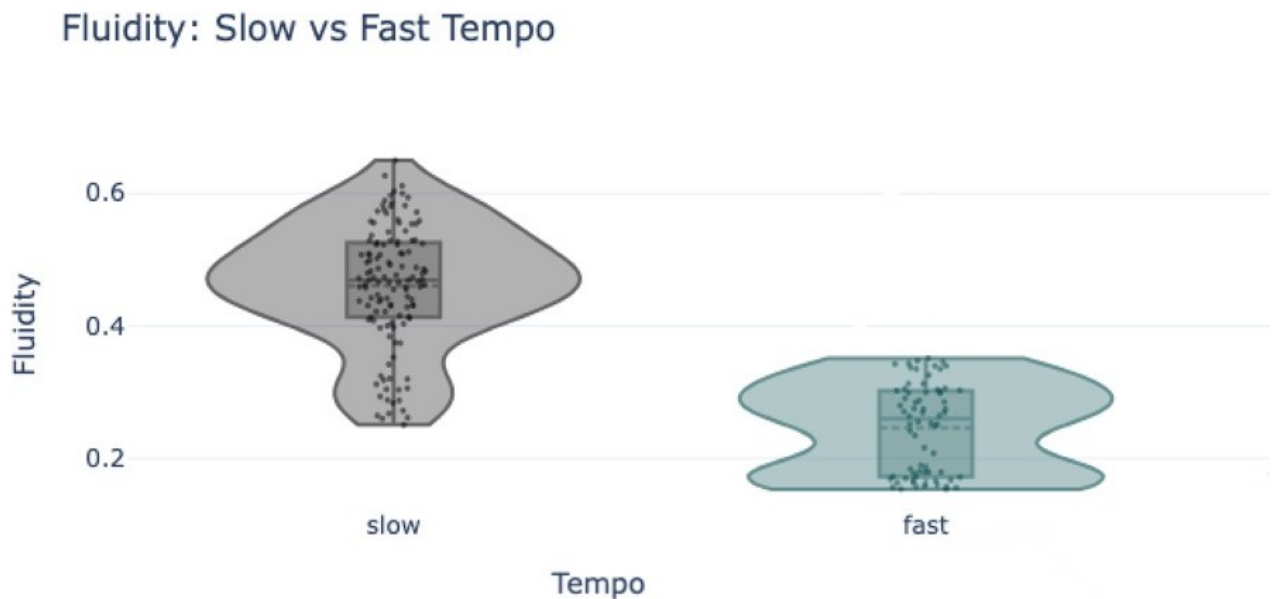


Figure IVIII: Fluidity: Slow vs Fast Tempo

The analysis reveals two distinct tempo categories with clear hierarchical effects on fluidity. The plot shows virtually no overlap between slow (clustering at 0.40-0.60) and fast (0.15-0.35) tempo distributions.

The interaction between region and tempo (see Figure X) revealed that while all regions showed reduced fluidity at faster tempos, the magnitude of this effect varied. The faceted analysis reveals region-specific tempo characteristics. Crete demonstrates the most dramatic shift (slow ≈ 0.50 to fast ≈ 0.26), while Pontos shows a more gradual three-tier progression (slow ≈ 0.34 , mixed ≈ 0.20 , fast ≈ 0.22). The absence of fast-tempo data for Epirus suggests a cultural preference for measured dignified pacing that aligns with the region's movement aesthetic. This tempo-fluidity relationship reflects biomechanical constraints: faster musical tempos necessitate quicker transitions between positions, reducing the time available for smooth acceleration and deceleration phases.

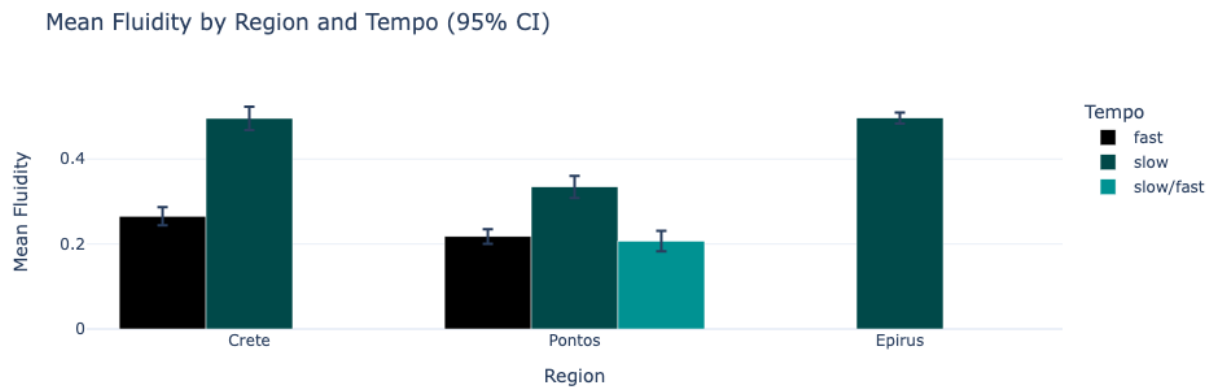


Figure X: Fluidity by Region and Tempo

Movement complexity (see Figure XI) showed an inverse relationship with tempo ($t = -4.41$, $p < 0.001$), with fast tempos yielding higher entropy values ($M = 0.159$) compared to slow tempos ($M = 0.124$).

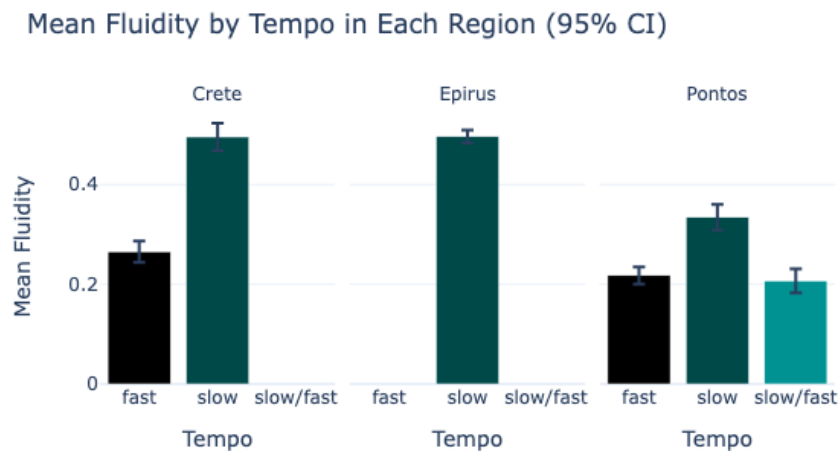


Figure XI: Fluidity by Tempo in each Region (95% CI)

Further analysis reveals that the relationship between tempo and complexity is robust (see Figure XII).

Fast tempos not only increase mean complexity but also expand the distribution range (0.10-0.32) compared to slow tempos (0.06-0.17). This suggests that rapid

execution introduces greater variability and unpredictability in movement sequences.

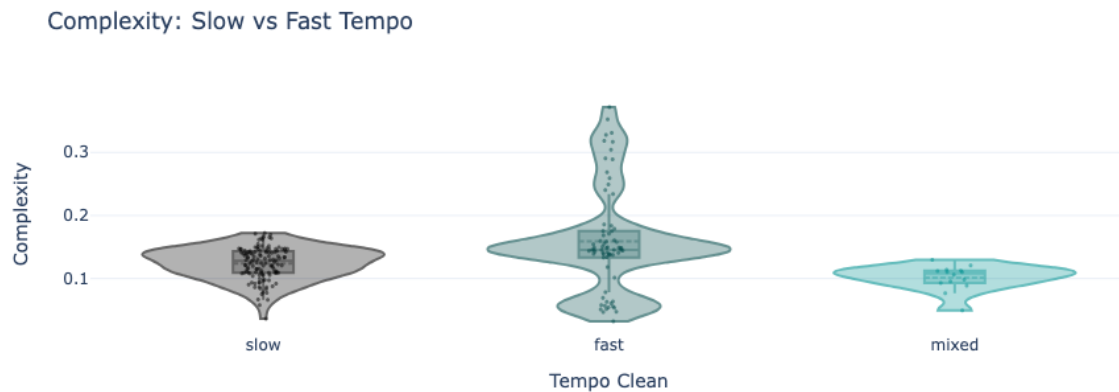


Figure IX: Complexity - Slow vs Fast Tempo

4.3.2 Meter Type Effects

Analysis of meter type (even versus odd meter types) revealed subtle but statistically significant effects. Odd meters produced slightly higher fluidity ($M = 0.398$) compared to even meters ($M = 0.359$), though the effect was marginally significant ($t = -1.97$, $p = 0.0497$). The violin plot comparison (see Figure XIII) shows substantial overlap between distributions despite the statistical significance. The violin plot morphology reveals that odd-meter dances achieve slightly higher median fluidity (~ 0.40 versus ~ 0.35), though with substantial overlap.

Fluidity: Even vs Odd Meter

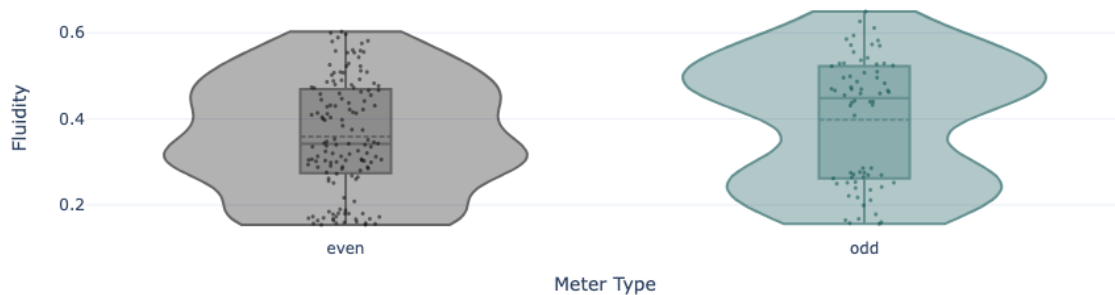


Figure X: Fluidity - Even vs Odd Meter

Conversely, even meters generated significantly higher average velocities ($t = 2.66$, $p = 0.0085$), with means of 510.34 versus 438.51 mm/s for odd meters. This pattern (see Figure XIV) suggests that the rhythmic regularity of even meters facilitates sustained momentum and predictable phrasing. The effect on velocity is more pronounced, with even-meter dances showing medians of 550-600 mm/s compared to 320-380 mm/s for odd meters, suggesting that the rhythmic irregularity of odd meters may impose natural speed constraints while potentially facilitating smoother transitions through added beats.

Avg Velocity: Even vs Odd Meter



Figure XI: Average Velocity - Even vs Odd Meter (mm/s)

4.4 Reliability and Individual Variation

To assess measurement reliability, subset analyses compared two recording versions of identical dances. Across all dances that were recorded twice, with all participating dancers included, results demonstrated exceptional consistency across all metrics. For fluidity, no significant difference emerged between versions ($t = 0.22$, $p = 0.827$), with nearly identical means (Version 1: 0.374, Version 2: 0.370). The violin plot comparison (see Figure XV) shows virtually superimposed distributions.

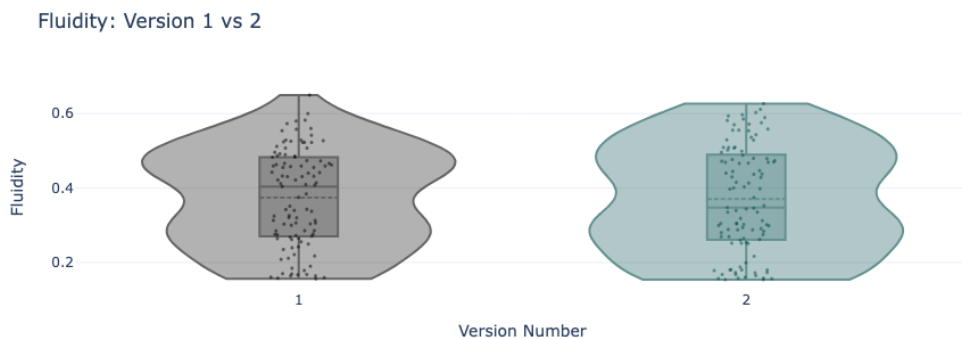


Figure XII: Fluidity - Version 1 vs 2

Male-only comparisons yielded similarly negligible differences, with Cohen's d effect sizes ranging from -0.139 to 0.049 across all metrics (see Figure XVI). The reliability analysis was further strengthened by examining the mean distance traveled, which captured the spatial extent of movement patterns. Comparisons between recording versions (see Table II) revealed no significant difference in distance traveled ($t = -0.286$, $p = 0.775$), with a negligible effect size (Cohen's $d = -0.060$).

Cohen's d (V1 vs V2) — Male Participants

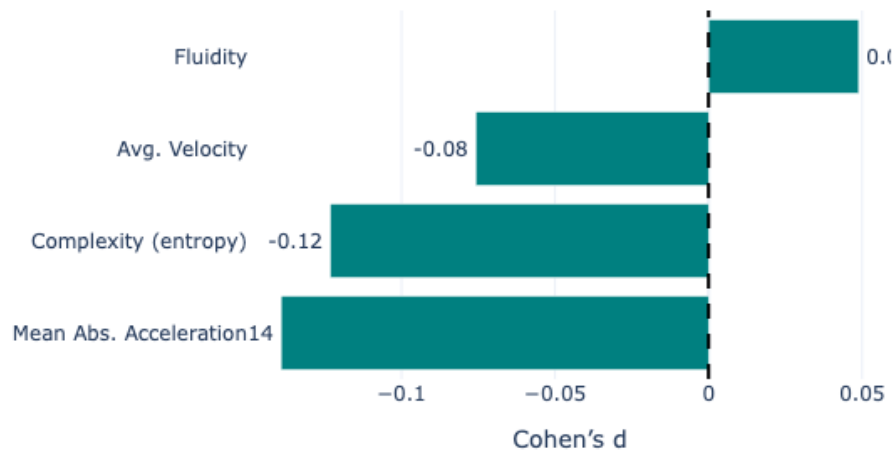


Figure XIII: Cohen's d – Version 1 vs 2, Male Participants

Metric	t-statistic	p-value	Cohen's d
Complexity	-0.584	0.560	-0.123
Fluidity	0.232	0.817	0.049
Average Velocity	-0.360	0.720	-0.076
Mean Absolute Acceleration	-0.660	0.511	-0.139
Mean Distance Traveled	-0.286	0.775	-0.060

Table II: Male-Only Version 1 vs 2 Comparison of Key Movement Metrics

This spatial consistency shows that dancers maintained similar movement trajectories and coverage patterns in different recording sessions. These values fall well below the 0.2 threshold for even small effects, confirming high measurement reliability and minimal influence of recording conditions on captured movement characteristics.

Analysis of variance by dancer revealed no significant effects on fluidity ($F = 0.65$, $p = 0.583$) and only marginal effects on average velocity ($F = 2.55$, $p = 0.057$). The violin plots by subject (see Figures XVII and XVIII) show largely overlapping distributions with minor variations in central tendency and spread.

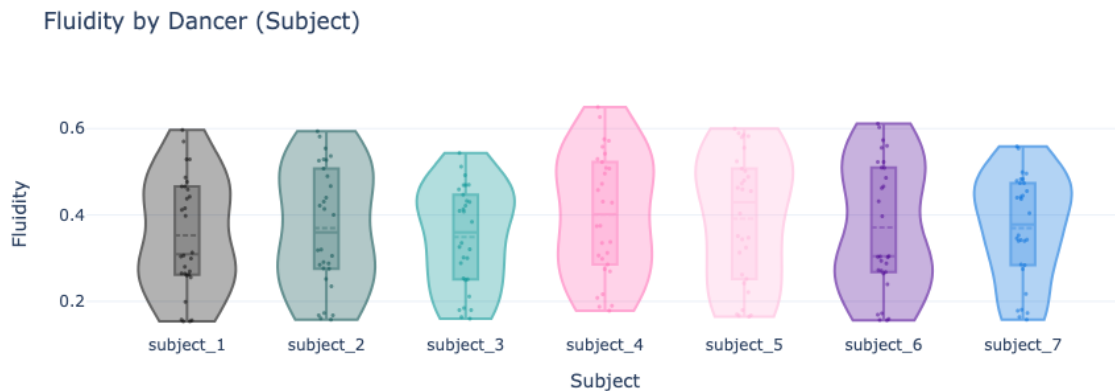


Figure XVII: Fluidity by Subject

While overall dancer effects remain minimal, subtle individual patterns emerge. Subject 4 displays a slightly elevated fluidity median, while Subjects 3 and 7 trend toward higher average velocities (visible in the tail extensions reaching 900+ mm/s). These modest individual signatures pale in comparison to the dominant regional and musical effects. This minimal inter-dancer variation suggests that regional style and musical parameters exert stronger influences on movement characteristics than individual

performance differences, supporting the validity of treating dances as representatives of regional traditions rather than personal interpretations.



Figure XVIII: Average Velocity by Subject (mm/s)

4.5 Correlational Patterns

The correlation matrix (see Figure XIX) revealed strong relationships between movement metrics:

1. Fluidity and Acceleration ($r = -0.88$): The strongest correlation indicates that smooth movements inherently involve lower acceleration magnitudes (measured as mean absolute acceleration, capturing intensity regardless of direction), reflecting the mathematical relationship between jerk minimization and controlled velocity changes. This exceptionally strong negative correlation suggests these represent opposing movement strategies. One cannot simultaneously maximize smoothness and rapid directional changes.
2. Velocity and Acceleration ($r = 0.79$): High positive correlation confirms that faster movements require greater accelerative forces, a fundamental biomechanical principle.

3. Complexity and Acceleration ($r = 0.39$): Moderate positive correlation suggests that more complex movement patterns involve increased velocity changes, though this relationship is weaker than the others. This indicates that varied movement patterns require some degree of dynamic motion but can be achieved through multiple strategies.

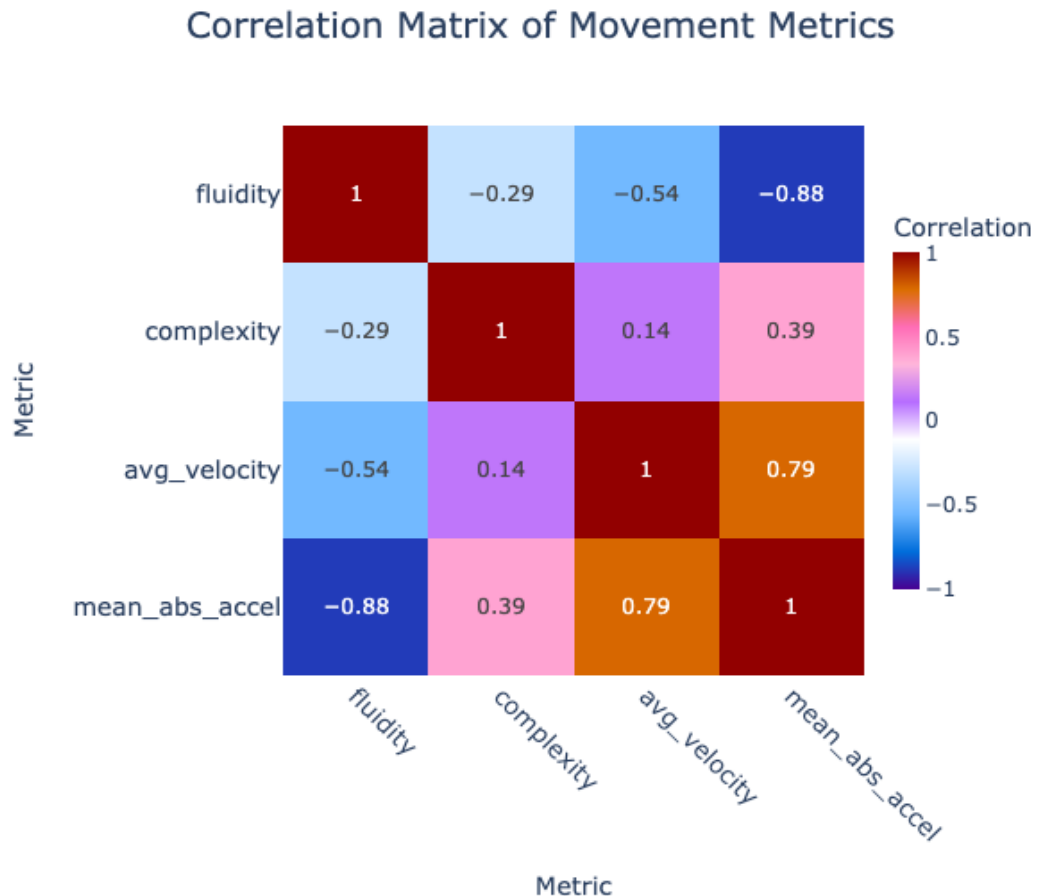


Figure XIV: Correlation Matrix of Movement Metrics

These correlational patterns reveal the interdependence of movement qualities and highlight fluidity as a fundamental principle that constrains other kinematic properties. The correlation heatmap reveals a hierarchical structure of biomechanical factors that govern traditional dance execution.

4.6 Synthesis of Findings

The current comprehensive statistical analysis shows that Greek traditional dances exhibit quantifiable regional signatures in their movement characteristics. The bootstrapped sampling distribution of fluidity means (see Figure XX) demonstrates low sampling variability (bootstrapped SD = 0.025), confirming the reliability and generalizability of observed group differences. The distribution's close match to the theoretical normal CLT curve, combined with the low bootstrap standard deviation, could be considered evidence for the generalizability of the findings beyond the sampled performances to the broader regional dance traditions they represent.

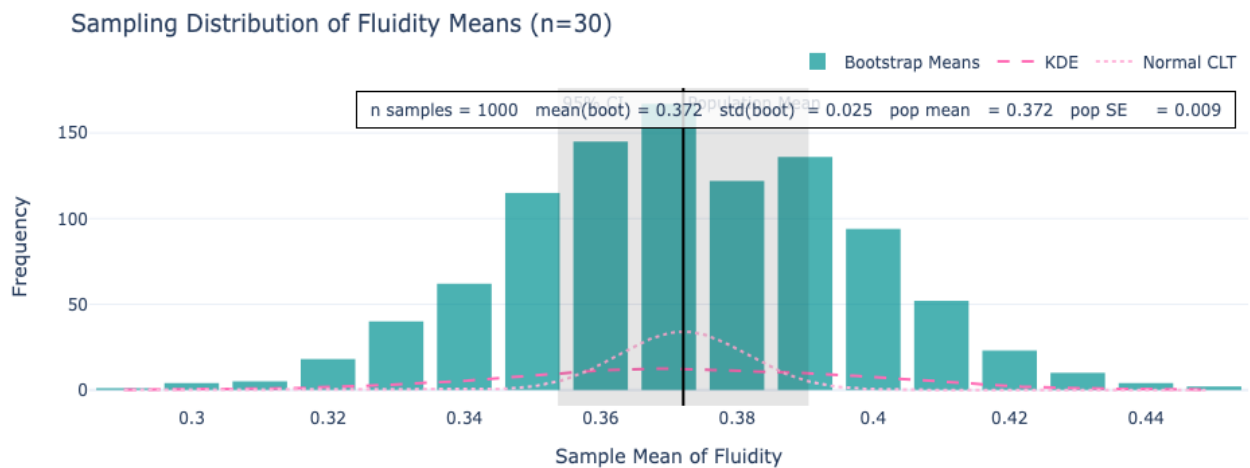


Figure XV: Bootstrapped Sampling Distribution of Fluidity Means (n = 30)

The fluidity distribution histograms by region (see Figure XXI) provide an alternative perspective using straightforward frequency counts. Crete's wide histogram with peaks around 0.30-0.40, Epirus's sharp peak at 0.45-0.55, and

Pontos's concentration at 0.20-0.30 reinforce the violin plot findings through a more traditional visualization approach.

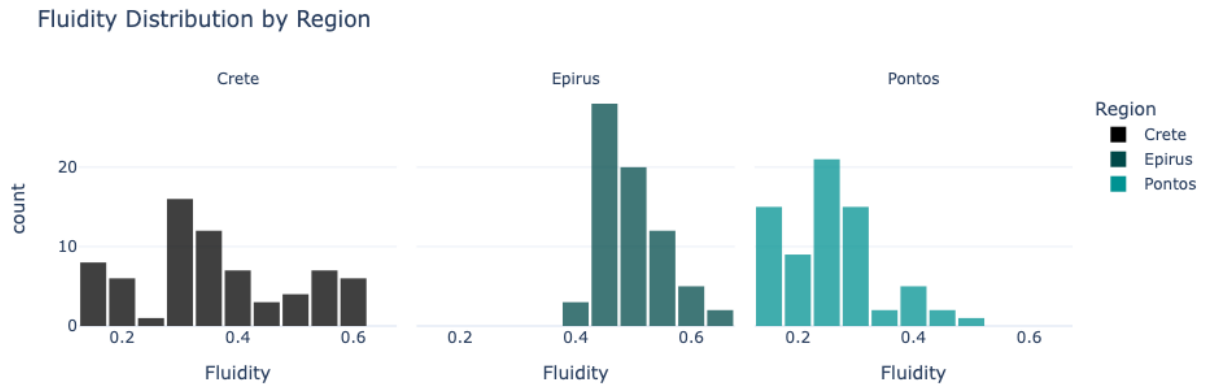


Figure XVI: Fluidity Distribution by Region

Key findings can be summarized as follows:

1. **Regional Distinctiveness:** Each region maintains a unique movement profile characterized by specific combinations of fluidity, complexity, velocity patterns, and limb-specific emphases.
2. **Musical Determinism:** Tempo emerges as the dominant factor influencing movement quality, with slow tempos in all regions promoting fluidity. Meter type shows subtler effects, primarily influencing velocity and rhythmic flow.
3. **Measurement Reliability:** High consistency across recording versions and minimal individual dancer effects validates the robustness of motion capture methodology for analyzing cultural movement patterns.
4. **Biomechanical Constraints:** Strong correlations between movement metrics reflect fundamental physical principles governing human motion, with fluidity serving as a central factor that influences other kinematic properties.

Research Contribution and Future Perspectives

5.1 Methodological Innovation and Research Contribution

The present study constitutes an inaugural step, as previously mentioned, towards the combination of motion capture technologies with the study and preservation of our intangible cultural heritage. A comparative analysis has been conducted among dancers, regions, dances, and body parts with the objective of identifying regional kinetic patterns within the context of Greek traditional dance. While the present research focuses specifically on Greek dance traditions, the methodology demonstrates applicability to cultural dance forms worldwide. Regional variation in movement patterns represents a universal characteristic of traditional dance across diverse cultures and geographical contexts. The present study took into consideration the influence of the dancer's biological sex on movement. In addition, the impact of music and rhythm on motion was investigated, and consequently on the dance itself. This approach constitutes a substantial innovation in comparison to the conventional methodologies that are traditionally employed in ethnochoreological research.

Traditional approaches to dance documentation, as evidenced in the work of Raftis²⁸⁶, Dimas²⁸⁷, and other researchers mentioned earlier, have relied primarily on observational analysis, written notation as well as video recordings. While these methods have provided valuable insights, they face inherent limitations in capturing the movement's full complexity and subtlety. As noted by Tyrovola²⁸⁸ in her morphological approach to dance analysis, dance comprises multiple structural levels. It starts from its very first unit, its core, a singularity, which is the

²⁸⁶ Alkis Raftis, Χορός, Πολιτισμός και Κοινωνία (Athens: Theatre "Dora Stratou", 1992)

²⁸⁷ Ilias S. Dimas, Vasiliki K. Tyrovola, and Maria I. Koutsoumpa, Ελληνικός Παραδοσιακός Χορός: Θεωρήσεις για το λόγο, τη γραφή και τη διδασκαλία του (Athens: [n.p.], 2010)

²⁸⁸ Vasiliki K. Tyrovola, Ο Ελληνικός Χορός: Μια διαφορετική προσέγγιση (Athens: Gutenberg, 2001)

very basic kinetic element and extends to a whole cluster of singularities that combine to create a choreographic composition. Well, motion capture technology enables precise measurement and analysis across all these levels with unprecedented accuracy.

The methodology employed in the current research allowed for quantitative measurement of movement characteristics that have previously been described only qualitatively. If we consider what Tyrovola²⁸⁹ describes as the “dynamic properties” of dance movements, which are “selected from a scale of human capabilities” and “based on the endurance and physiology of human kinetic ability”, we realize how valuable this precision actually is. Since Motion capture provides objective data on all these very specific properties, it enables more rigorous comparative analysis.

5.1.1 Documentation of Regional Characteristics

The comparative analysis among Crete, Pontus, and Epirus, our three regions, has yielded preliminary evidence of distinctive kinetic motifs that characterize each regional dance tradition. The above observation could also align with Raptis’ observation based on which, although every village influences and is being influenced by its surrounding regions, it also follows its own distinctive path of creation and evolution. The motion capture data in our research provided quantifiable evidence of these regional particularities and could potentially become a means of documenting what might be called the “kinetic dialect” of each region.

If we take the knee flexion, for instance, referred to as 'spasimo' (breaking) or 'lygisma sto gonato' (knee bending/flexion), which is considered a distinctive characteristic of Pontic dances such as Tik and Kotsari, we can witness it captured with precision in the data. Similarly, the characteristic dynamics of Cretan dances,

²⁸⁹ Ibid.

such as Pentozalis, described in our sources as “clipped and nervous in quality,” are quantifiably represented in the motion data.

5.1.2 Biological Sex’s Influence on Movement Execution

The analysis at the dancer level also allowed for a preliminary examination of whether biological sex influences the execution of the dances. Traditional Greek dance formations, as examined earlier through the introduction to the Greek “panegyri” (festival), reflect broader social structures, with the whole existence of the participants being influenced by societal expectations associated with biological sex, age, and social position. The dance circle itself often serves as a microcosm of the community's social organization. It is inevitable, therefore, to expect that an individual's expression through movement would be bound by culturally established permissions and limitations.

However, it must be acknowledged that the current study's participant composition, with the male consistently occupying the lead position, presents significant methodological limitations for drawing definitive conclusions about sex-based movement differences. A rigorous investigation of this phenomenon would require much larger sample sizes determined through randomization of dancer positions within the circle formation, and controlled manipulation of the social variables that naturally structure traditional dance participation. Such a study would be challenging to implement authentically. It would necessitate either a controlled laboratory environment that disrupts the natural social order of traditional dance or a fieldwork scenario specifically designed for this scientific purpose, where the customary structure could be systematically varied.

Nevertheless, the motion capture methodology demonstrates the potential to move beyond general observations about biological sex differences and quantitatively measure specific variations in movement quality, amplitude, and emphasis. This

highly quantitative approach could complement the rich ethnographic descriptions found in the literature, providing empirical evidence of how social norms and roles are embodied in dance execution, provided that future research addresses these methodological requirements with appropriate experimental design and adequate participant sampling.

5.1.3 Rhythm and Movement Relationship

The relationship between music and movement is fundamental to Greek traditional dance. In the traditional context, music and dance exist not as separate entities but as integrated expressions of cultural identity. According to Mavrovouniotis²⁹⁰, movement, sound, and word function only as inseparable elements that merge within dance practice. Even when these elements are examined individually, they represent only fragments of a unified whole that constitutes what we understand as the complete dance experience.

Understanding this profound interconnection among those three elements, it is considered meaningful to examine if and how musical structures directly influence bodily movement. By analyzing the temporal relationships between musical beats and movement impulses, we sought to quantify the precise ways in which rhythmic patterns affect movement and dance execution. This allowed us to observe how dancers physically embody musical elements, responding to changes in tempo, accentuation, and melodic contours with corresponding adaptations in their movements.

²⁹⁰ Fotios Mavrovouniotis, Alexandros Malkogeorgos, and Eirini Argyriadou, *Ελληνικοί λαϊκοί χοροί: διδακτική των χορών, ο κοινωνικός & ψυχολογικός ρόλος του χορού, χορός & υγεία-χοροθεραπεία* (Thessaloniki: University Studio Press, 2013)

Through this approach, our purpose was to document empirically what has long been observed ethnographically: that in Greek traditional dance, music and movement exist in constant dialogue, each informing and transforming the other.

5.2 Future Research Directions and Potential Applications

The main purpose of the current study, as previously emphasized, is not to draw definitive conclusions about the regions in question. Instead, the objective is to establish a foundation for expanded research utilizing motion capture technology in the documentation, analysis, and preservation of tradition. The study so far has yielded several promising research directions for future, more intensive, and larger-scale research.

5.2.1 Expanded Comparative Analysis

What the main aim of future research should be, is to expand the database by incorporating a more diverse array of performers. It should particularly emphasize the participation of dancers, native to the regions from which the documented dances originate. The primary objective would be to increase both the quantity and authenticity of the kinetic data collected through motion capture technology to a greater extent. By recording traditional dancers who have acquired their skills through cultural immersion rather than formal instruction, subsequent studies could capture even more movement qualities and regional variations.

This broader sample not only would function as a great tool for the preservation of the wealth and multifarity of Greek tradition, but it would also enable a more nuanced documentation of all those subtle differences in execution that distinguish one village's dance tradition from another's. Thereby, it would add to the preservation of this dance heritage in its most authentic form.

Furthermore, the establishment of such a comprehensive and diverse dataset would allow for many more definitive conclusions regarding the similarities and differences in dance practices among different regions. It would provide a more authoritative foundation for comparative analysis of Greek dance traditions.

5.2.2 Historical Movement Analysis

A compelling potential application of motion capture technology lies in the comparative analysis and study of regional dance traditions, in our case, particularly between Crete and Pontus, to identify potential cultural exchanges that might be present in the movement and that would confirm what scholarly literature suggests about these geographically distant populations' historical interactions and coexistence. This intriguing proposition, which has been the initial concept of the current study, is not, of course, limited to the comparative analysis of regions only but also extends to the analysis of historical epochs. So, it could extend into investigating potential continuities between traditional Greek dance forms and ancient Greek practices.

The scholarly literature, along with archeological findings, provides strong indications that certain traditional Greek dances represent continuations of ancient ones. These dances appear to have persisted in Greece from antiquity to the present day, maintaining similar movements, patterns, expressions, hand positions, and musical meters across centuries. While establishing direct historical continuity remains unfortunately methodologically challenging, motion capture data from dancers could be analyzed in relation to ancient visual representations and textual descriptions to identify potential movement continuities.

Such research would contribute to ongoing scholarly discussions about dance as a vessel of cultural memory and historical continuity, particularly considering how

dance organically embodies and transmits collective memory through generations without relying on formal written methods of instruction.

5.2.3 Educational Applications

Perhaps the most immediately applicable potential of motion capture technology lies in dance education. As traditional contexts for dance transmission diminish, formal instruction becomes, as discussed, more and more the primary mode of transmission for many Greek dance forms. Motion capture offers powerful tools to enhance this instructional process while also helping maintain greater fidelity to authentic movement qualities.

The technology enables:

1. Remote learning opportunities through a detailed visual representation of movement. A fact of great importance in the modern lifestyle
2. Comparative analysis between student and teacher executions. This comparison enables precise identification of all those subtle differences in movement quality, weight shifts, timing, and even spatial orientation, allowing learners to understand not just the external form of steps but also the internal mechanics and dynamic qualities that distinguish authentic regional dance styles from their standardized derivatives
3. Visualization of subtle movement qualities, difficult to articulate verbally. So, it becomes an invaluable tool for identifying all those distinctive regional characteristics that collectively contribute to the formation of a unique regional style
4. Preservation of regional stylistic particularities.

These applications address a critical concern in contemporary folk-dance preservation. There is the danger that even accomplished dancers can become overly focused on fixed routines rather than embodying the improvisational spirit

essential to traditional dance²⁹¹. As the dance transitions from its original communal context to performance settings, dancers risk losing the ability to spontaneously express themselves, concentrating on memorized sequences rather than living the dance as an organic expression. Motion capture-based educational tools could help bridge the gap between choreographic precision and authentic expressivity by making implicit movement qualities explicit and accessible to learners outside traditional contexts.

Additionally, the quantified movement data can be transformed into interactive three-dimensional models for self-directed learning. These digital tools would enable students to practice from home, addressing the needs of learners who feel inhibited in group settings, while offering capabilities such as adjustable playback speeds, multi-angle viewing perspectives, and repeatable examination of specific movement sequences. The integration of such technology could offer access to traditional dance education while respecting individual learning styles and social comfort levels.

5.2.4 Cultural Heritage Preservation

Beyond the academic research and the educational purposes that have been discussed so far, motion capture technology holds significant potential for cultural heritage preservation. As Kritsioti²⁹² notes, traditional dance “carries and transmits the knowledge and history of a society”. In contemporary contexts where traditional dance is increasingly separated from its original social functions, comprehensive, detailed documentation becomes crucial, more so than ever before.

²⁹¹ Rickey Holden and Mary Vouras, *Greek Folk Dances* (Newark, NJ: Folkart Press, 1965)

²⁹² Marigoula Kritsioti, “Χορός και Προφορική Ιστορία,” in *Χορός και Ιστορία* (Aridaia: Diethnis Organosi Laikis Technis, 2000)

The creation of a digital archive of traditional dance forms, captured with the precision afforded by motion capture technology, would constitute an absolutely invaluable cultural resource. Such an archive could serve multiple purposes:

1. Preservation of movement traditions facing potential loss
2. Resource for dance practitioners seeking authentic reference materials
3. Educational material for cultural heritage programs
4. Source data for cultural exhibitions and digital presentations
5. Training datasets for AI-aided classification and recognition of dance forms from video recordings
- 6.

5.3 Methodological Recommendations for Future Research

Based on the experiences gained from the current study; several methodological considerations have emerged that could be of use for future research utilizing motion capture in Greek traditional dance documentation.

Future studies should aim to include dancers representing different generations, particularly emphasizing practitioners who acquired their dance knowledge through traditional community contexts rather than formal instruction. As our literature review indicates, the most valuable informants for understanding traditional dance are often the elderly, who can provide information about the importance of dance in the traditional communities.

While motion capture provides precise movement data, the documentation should be complemented by comprehensive contextual documentation, including interviews with dancers regarding their experience, their understanding of the dances' significance, as well as their personal relationship with the tradition. This

combined approach would address Tyrovola's²⁹³ methodological observation that dance structure should be examined in relation to both form and content. Regarding the future of research methodologies, the use of markerless motion capture technologies (such as AI-based systems like Theia Markerless) is set to represent a significant development for the documentation of dance. The elimination of the need for tight-fitting suits and physical markers is a key benefit of these emerging technologies. This would allow dancers to move more naturally and behave more authentically, thereby reducing the artificiality inherent in marker-based systems while maintaining the precision necessary for those kinds of analysis.

5.4 Final Observations: The Promise of Motion Capture Technology

Concluding, we realize that the application of motion capture technology to the study of Greek traditional dance represents a significant methodological innovation with far-reaching implications for research, education, and cultural preservation. By enabling precise documentation of movement characteristics across regions, between biological sexes, and in relation to musical structures, this approach provides new insights into the dynamic internal expression of human spiritual powers through movement.

Dance in traditional Greek society, as it has been discussed several times so far, was holistically functional. It occupied a central rather than supplementary role in community life. The comprehensive documentation made possible by motion capture technology offers a means to preserve its holistic quality, even nowadays that dance increasingly exists outside its original cultural contexts. Through

²⁹³ Vasiliki K. Tyrovola, *Ο Ελληνικός Χορός: Μια διαφορετική προσέγγιση* (Athens: Gutenberg, 2001)

continued refinement and expanded application, this approach could potentially contribute significantly to the documentation as well as the analysis, and transmission of Greek dance traditions for future generations.

This unprecedented level of detail afforded by motion capture makes it a really powerful tool for that purpose. It is able to capture the very essence of authentic dance mastery, meaning the ability to extend traditional movement vocabularies without betraying their fundamental character. This technology allows us to document this very delicate balance between tradition and personal expression that characterizes authentic traditional dance, preserving not just the steps but the spirit of this vital cultural heritage.

CONCLUSION

The present study employs motion capture technology to explore and compare morphological features of traditional Greek dances. Constrained by the limited dataset, the findings are to be regarded as foundational insights rather than definitive conclusions. The analysis relies exclusively on the currently available evidence, thereby establishing a robust framework for more extensive future research.

As proven earlier in the theoretical part of the study, traditional communities employed dance as a sophisticated system for encoding and transmitting social knowledge, with movement sequences serving as the community's living memory. Village festivals operated as laboratories of cultural transmission, where each gesture encapsulated institutional relationships and community hierarchies. Even the order in the dance circle embedded social codes reflecting age, status, and structures that governed traditional societies.

By substantiating the morphological framework for dance analysis, the present research demonstrates that structural characteristics can be reliably identified through systematic movement assessment. Moreover, integrating motion capture

technology with anthropological and historical perspectives has proven effective in contextualizing movement within broader cultural frameworks. Analysis demonstrates that traditional dance functions as a valid historical source, providing nuanced insights into social structures and cultural practices that complement written records.

Several constraints limit these findings' generalizability beyond the current dataset. The geographic scope across three regions cannot capture Greek traditional dance's full diversity, while temporal restrictions limited access to practitioners with authentic knowledge. Technical limitations prevent, of course, documentation of experiential and spiritual dimensions essential to genuine performance. Motion capture records movement patterns precisely but cannot capture emotional resonance, community context, and improvisational spirit that define traditional practice.

Future research should expand to additional Greek regions where traditional customs remain vibrant. Comparative studies with neighboring Balkan traditions could illuminate broader cultural patterns connecting Greek dance to its regional context. Comprehensive digital archives integrating motion capture data with oral histories and ethnographic documentation represent a critical priority. Training programs could and should implement new methods of teaching and disseminating the subtle yet distinctive characteristics of regional movements. By utilizing motion capture as one of those methods, cultural heritage could benefit greatly.

This investigation reaffirms dance's fundamental role as a carrier of collective memory in traditional Greek society. The documented movements represent expressions of social organization, spiritual conviction, and collective identity that have persisted across centuries of change. Dance serves as a vital bridge between the past and the present, giving contemporary communities access to ancestral knowledge embedded in movement patterns that predate written records. However, the ongoing transition from community-based practice to institutionalized folkloric presentation endangers this irreplaceable knowledge, which is at risk of permanent loss. Therefore, our preservation efforts must go beyond merely documenting choreographic sequences, capturing instead the living pulse of

traditional Greek cultural identity. This will ensure that future generations inherit not just the steps but also the cultural wisdom they embody.

LITERATURE

Aristidou, Andreas, Stavrakis, Efstathios, Chrysanthou, Yiorgos. Motion Analysis for Folk Dance Evaluation. In Proceedings of the Eurographics Workshop on Graphics and Cultural Heritage, University of Cyprus, Nicosia, Cyprus, 2014.

Athanasiadis, Dimitrios. Πυρρίχιος Χορός (Σέρα – Τρομαχτός): Ιστορική Ανάλυση – Συμβολή στη Λαογραφία [Pyrrichios Dance (Sera – Tromachtos): A Historical Analysis – Contribution to Folklore]. Thessaloniki: Ekdoseis Kyriakidi, 2006.

Burger, Birgitta, and Toiviainen, Petri. MoCap Toolbox – A Matlab Toolbox for Computational Analysis of Movement Data, in Proceedings of the 10th Sound and Music Computing Conference (Stockholm: KTH Royal Institute of Technology, 2013)

Bury, John B. The Imperial Administrative System in the Ninth Century, with a Revised Text of Kletorologion of Philotheos. London: Published for the British Academy, 1911. <https://archive.org/details/imperialadminist00buryrich/mode/2up> (accessed April 15, 2025).

Cambridge Dictionary.

<https://dictionary.cambridge.org/de/worterbuch/englisch/professional> (accessed April 15, 2025).

Chatzisavvidis, Sofronis. Η ΠΟΝΤΙΑΚΗ ΔΙΑΛΕΚΤΟΣ: Η ΙΣΤΟΡΙΑ ΤΗΣ ΚΑΙ Η ΧΡΗΣΗ ΤΗΣ ΣΤΟΝ ΕΛΛΑΔΙΚΟ ΧΩΡΟ ΣΗΜΕΡΑ [The Pontic Dialect: Its History and Its Use in Greece Today]. Thessaloniki: Aristotle University of Thessaloniki, 2012. <http://ikee.lib.auth.gr/record/265066/files/PontiakhDialektos.pdf> (accessed April 15, 2025).

Collective work. Ήπειρος: 4000 χρόνια ελληνικής ιστορίας και πολιτισμού [Epirus: 4000 Years of Greek History and Culture]. Athens: Ekdotiki Athinon, 1997.

Coros, Mary. What Traditional Dances Do Cretans Know? In Χορός και Ιστορία [Dance and History], compiled by Diethnis Organosi Laikis Technis. Aridaia: Diethnis Organosi Laikis Technis, 2000.

Cowan, Jane K. Dance and the Body Politic in Northern Greece. New Jersey: Princeton University Press, 1990. <http://www.jstor.org/stable/j.ctt1dxg8mf> (accessed April 15, 2025).

Dimas, Ilias S. Ελληνικοί παραδοσιακοί χοροί [Greek Traditional Dances]. Athens: Grafikes texnes Alekou Kalemi, 1993.

Dimas, Ilias S., Tyrovola Vasiliki K., and Koutsoumpa Maria I. Ελληνικός Παραδοσιακός Χορός: Θεωρήσεις για το λόγο, τη γραφή και τη διδασκαλία του [The Greek Traditional Dance: Theories on Its Discourse, Notation, and Pedagogy]. Athens: [n.p.], 2010.

Dimitriou, Nikolaos V., and Dimitriou Eleftherios N. Βόρειος Ήπειρος: τραγούδια και χοροί [Northern Epirus: Songs and Dances]. Athens: Trochalias, 2000.

Dumbarton & Oaks. Hagiography Database
<https://www.doaks.org/research/byzantine/resources/hagiography/hagiointro.pdf>
(accessed April 15, 2025).

Gaitanidis, Pavlos A. Η ποντιακή μουσική παράδοση, η σημερινή κατάσταση [The Pontic Musical Tradition, Its Current State]. Thessaloniki: Aristotle University of Thessaloniki, Department of Music Studies, 1993.

Gaitanidis, Pavlos A. Η ποντιακή μουσική ως επέκταση της βυζαντινής μουσικής [Pontic Music as an Extension of Byzantine Music]. PhD diss., Thessaloniki: Aristotle University of Thessaloniki, Faculty of Theology, Department of Pastoral and Social Theology, 2018. <http://ikee.lib.auth.gr/record/302162> (accessed April 15, 2025).

Giannopoulos, Meletios E. Βίος, Πολιτεία, Εικονογραφία Θαύματα και Ασματική Ακολουθία του Οσίου και Θεοφόρου Πατρός ημών Νικοδώμου του “Μετανοείτε” [Life, Conduct, Iconography, Miracles, and the Hymnal Office of Our Venerable and God-bearing Father Nicodemus “Repent”]. Athens: Ekdoseis Papanikolaou, 1933.

Giantamidis, Christos. Οι Ακατάλυτοι Δεσμοί Ποντίων και Κρητικών [The Indisputable Bonds of Pontians and Cretans]. Athens: Arxeion Politismou, 2020.

Georgiadis, Thanasis. Εγκυκλοπαίδεια του Ποντιακού Ελληνισμού: ιστορία, λαογραφία, πολιτισμός [Encyclopedia of Pontic Hellenism: History, Folklore, Culture]. Thessaloniki: Malliaris-Paideia, 1990–1992.

Grigoriadis, Georgios. Ο Πόντος και το Κάρς: (ιστορία, λαογραφία και “ο Κορπακόρτς ο Πέτρον”): εντυπώσεις από επίσκεψη του 1972 [Pontus and Kars: (history, folklore, and “o Korpakopts o Petron”): impressions from a 1972 visit]. Athens: Typois Promitheus, 1973.

Gottlob, Hertlein Fr Karl. Xenophons Anabasis. Deutschland: Weidmann, 1854.

Hegarini, Ega, Dharmayanti, Abdus Syakur. Indonesian Traditional Dance Motion Capture Documentation. Faculty of Computer Science & Information Systems, Gunadarma University, Indonesia, 2016

Holden, Rickey, and Vouras, Mary. Greek Folk Dances. Newark, NJ: Folkart Press, 1965.

Holzapfel, Andre. Leaping Dances in Crete: Tradition in Motion. ICS-FORTH (Institute of Computer Science, Foundation for Research and Technology–Hellas), Heraklion, Greece, and Boğaziçi University, Istanbul, Turkey, 2014.

Holzapfel, André. Structure and Interaction in Cretan Leaping Dances: Connecting Ethnography and Computational Analysis. Ph.D. Thesis, Istanbul Technical

University, Graduate School of Arts and Social Sciences, Department of Music, June 2018.

Jiang, Xin. Application of Motion Capture Technology Based on Dance Big Data in Dance Retrieval. Applied Mathematics and Nonlinear Sciences. China, 2023.

Kalaitzakis, Vasilis I. Η Κρήτη και οι Σαρακηνοί [Crete and the Saracens]. Athens: Rontas, 1984.

Kanev, Nikolay. Byzantine Rank Hierarchy in the 9th – 11th Centuries. Studia Ceranea: Journal of the Waldemar Ceran Research Centre for the History and Culture of the Mediterranean Area and South-East Europe 8 (pp 153–165), 2018. <https://www.cceol.com/search/article-detail?id=744399> (accessed April 15, 2025).

Karayannopoulos, Johannes. Die Entstehung der byzantinischen Themenordnung [The Origin of the Byzantine Theme System]. Vol. 10. München: Walter de Gruyter GmbH & Co KG, 2020.

Kokkinos, Giannis G. Ελληνικοί Χοροί: Ιστορική Εξέλιξη και μουσική ανάλυση [Greek Dances: Historical Evolution and Musical Analysis]. Thessaloniki: Salto, 1993.

Kolias, Taxiarchis G. Νικηφόρος [Β'] Φωκάς (963–969): Ο Στρατηγός Αυτοκράτωρ και το Μεταρρυθμιστικό του Έργο [Nikiforos [II] Fokas (963–969): The Emperor-General and His Reformative Work]. Athens: Istorikes Ekdoseis St. D. Vasilopoulos, 1993.

Kornarakis, Eleftherios, and Makri, Stavroula. “Κρητικός Χορός: Ιστορία και Μύθος” [Cretan Dance: History and Myth]. In Χορός και Ιστορία [Dance and History]. Aridaia: Diethnis Organosi Laikis Technis, 2000.

Kraus, Richard G. Ιστορία του Χορού [History of Dance]. Athens: Nefeli, 1980.

Kritsioti, Marigoula. “Χορός και Προφορική Ιστορία” [Dance and Oral History]. In Χορός και Ιστορία [Dance and History]. Aridaia: Diethnis Organosi Laikis Technis, 2000.

Kritsiotaki, Marianthi. Ο Χορός στη Μινωική Κρήτη [Dance in Minoan Crete]. Trikala: University of Thessaly, 2000.

Ktenidis, Filon Th. Ο τελευταίος ο χορός: ποντιακή ηθογραφία σε τρεις πράξεις και μία εικόνα [The Last Dance: Pontic Ethnography in Three Acts and One Image]. Thessaloniki: [n.p.], 1959.

Kyriakidis, Theodosios Ar. Η πολυτροπία μιας ταυτότητας: δοκίμια για τον Ποντιακό Ελληνισμό [The Multifaceted Nature of an Identity: Essays on Pontic Hellenism]. Thessaloniki: K–M. Stamouli, 2021.

Laferrière, Carolyn. “Dancing with Greek Vases: Communicating through Sight, Movement, and Material.” Greek and Roman Musical Studies 9, no. 1 (Special issue). Netherlands: Brill, 2021: 85–114.

Lampsidis, Panos. Δημοτικά τραγούδια του Πόντου [Folk Songs of Pontus]. Athens: Typographeion Mavridi, 1960.

Lykesas, Giorgos Ch. Οι Ελληνικοί Χοροί: Ιστορική – Πολιτιστική – Κοινωνιολογική και Μουσικοκινητική θεώρηση [The Greek Dances: A Historical, Cultural, Sociological, and Music-Dance Analysis]. Thessaloniki: University Studio Press, 1993.

Mammpoulos, Alexandros Ch. Ήπειρος: λαογραφικά-ηθογραφικά-εθνογραφικά [Epirus: Folklore, Dance, and Ethnography]. Athens: Typographeio Pan. Drouka kai Nik. Konsola, 1964.

Mavrovouniotis, Fotios, Alexandros Malkogeorgos, and Eirini Argyriadou. Ελληνικοί λαϊκοί χοροί: διδακτική των χορών, ο κοινωνικός & ψυχολογικός ρόλος του χορού, χορός & υγεία-χοροθεραπεία [Greek Folk Dances: Dance Pedagogy,

the Social & Psychological Role of Dance, Dance & Health – Dance Therapy]. Thessaloniki: University Studio Press, 2013.

Mavrovouniotis, Fotios, Alexandros Malkogeorgos, and Eirini Argyriadou. Ελληνικοί Χοροί [Greek Dances]. Thessaloniki: Ekdotiki Aiginou, 2006.

Michaelis, Attalates. Historia, recensuit E. Th. Tsolakis (Athens, 2011), <https://dn721905.ca.archive.org/0/items/cfhb-11.1-nicetae-choniatae-historia/CFHB%2050.%20Michaelis%20Attalatae%20Historia%2C%20recensuit%20E.%20Th.%20TSOLAKIS.%20Athens%202011.pdf> (accessed April 15, 2025).

Monfasani, John. George of Trebizond. In: Lagerlund, H. (eds) Encyclopedia of Medieval Philosophy. New York: University of Albany, 2020.

Panagi, Loukia. Η ανακατάληψη της Κρήτης από το Νικηφόρο Φωκά (961) [The Reoccupation of Crete by Nikiforos Fokas (961)]. Master's thesis, Thessaloniki: Aristotle University of Thessaloniki, Faculty of Philosophy, Department of History and Archaeology, 2009.

Papachristos, Vasileios K. Ελληνικοί χοροί [Greek Dances]. Thessaloniki: Salto, 1979.

Papailiakis, G. Οι αγώνες της Κρήτης: από της μινωικής εποχής μέχρι της απελευθερώσεως της: ομιλία ιστορική μονογραφία [The Struggles of Crete: From the Minoan Era to Its Liberation: A Speech – Historical Monograph]. Athens: Typois efim. “Kritiki Enotis”, [1940?].

Paparrigopoulos, Konstantinos. Η ιστορία του Ελληνικού έθνους από των αρχαιοτάτων χρόνων μέχρι το 1930 [The History of the Greek Nation from the Earliest Times to 1930]. Athens: Eleftheroudakis, 1932.

Pitsikakis, Grigorios Konstantinou. Η απελευθέρωση της Κρήτης από τον Νικηφόρο Φωκά και η αποκατάσταση του Εκκλησιαστικού Οργανισμού [The

Liberation of Crete by Nikiforos Fokas and the Restoration of the Ecclesiastical Organization]. Master's thesis, Thessaloniki: Aristotle University of Thessaloniki, Faculty of Theology, Department of Social Theology and Christian Culture, 2024.

Poulianos, Aris. Η καταγωγή των Κρητών [The Origin of Cretans]. Athens: Anthropologiki Etaireia, 2004.

Pranteidis, Giannis. Ο χορός στην ελληνική παράδοση και η διδασκαλία του [Dance in the Greek Tradition and Its Teaching]. Aiginio: Ekdotiki Aiginiiou, 2004.

ProtoThema. “961: Ο Νικηφόρος Φωκάς απελευθερώνει την Κρήτη από τους Σαρακηνούς” [961: Nikiforos Fokas Liberates Crete from the Saracens]. December 16, 2018.
<https://www.protothema.gr/stories/article/847788/961-o-nikiforos-fokas-apeleutheronei-tin-kriti-apo-tous-sarakinous/> (accessed April 15, 2025).

Protopapadakis, Eftychios, Voulodimos Athanasios, Doulamis Anastasios, Camarinopoulos Stephanos, Doulamis Nikolaos, Miaoulis Georgios. “Dance Pose Identification from Motion Capture Data: A Comparison of Classifiers.” *Technologies* 6. Rhodes, 2018
<https://doi.org/10.3390/technologies6010031> (accessed June 15, 2025).

Provelegios, Aristomenis. Νικηφόρος Φωκάς: τραγωδία εις πράξεις πέντε [Nikiforos Fokas: A Five-Act Tragedy]. Athens: Estia, 1914.

Qualisys Motion Capture Manual.
https://docs.qualisys.com/getting-started/content/getting_started/introduction.htm
(accessed April 15, 2025).

Raftis, Alkis. Ο Κόσμος του Ελληνικού Χορού [The World of Greek Dance]. Athens: Polytypo, 1985.

Raftis, Alkis. Χορός, Πολιτισμός και Κοινωνία [Dance, Culture, and Society]. Athens: Theatre “Dora Stratou”, 1992.

Raftis, Alkis, ed. *Dance and Oral History*. Ioannina: Municipality of Saint Dimitrios Ioannina and the International Organization of Folk Art – Greek Section, 2001.

Samoulidis, Christos S. *Ιστορία του ποντιακού ελληνισμού* [History of Pontic Hellenism]. [Athens]: Alkyon, [19—].

Savvidis, Alexios G. K. *Ο Βυζαντινός Πόντος (4ος – 15ος αιώνας μ.Χ.). Ιστορικές Συμβολές* [Byzantine Pontus (4th – 15th Century AD). Historical Contributions]. Athens, 2013.

Schlumberger, Gustave Leon. *Ο Αυτοκράτωρ Νικηφόρος Φωκάς* [Emperor Nikiforos Fokas]. Athens: Typois P. D. Sakellariou, 1905.
<http://invenio.lib.auth.gr/record/122896?ln=el> (accessed April 15, 2025).

Schlumberger, Gustave Leon, and Ioannis M. Chatzifotis. *Ο Αυτοκράτωρ Νικηφόρος Φωκάς και η Βυζαντινή εποποιΐα, κατά τα τέλη της I' εκατονταετίας* [Emperor Nikiforos Fokas and Byzantine Epic Poetry at the End of the First Millennium]. Athens: Grigoriadis, 1977.

Spiliotopoulou, Konstantina. *Εισάγοντας την Προφορική Ιστορία στην έρευνα των παραδοσιακών χορών* [Introducing Oral History into the Research of Traditional Dances]. In *Dance and Oral History*, edited by Alkis Raftis. Ioannina: International Organization of Folk Art–Greek Section, 2001.

Suh, Il Hong, Sang Hyoung Lee, Nam Jun Cho, Woo Young Kwon. *Measuring Motion Significance and Motion Complexity*. Information Sciences, Vols. 388–389, Korea, 2017.

Sullogiko. *Ήπειρος: ιστορία και πολιτισμός* [Epirus: History and Culture]. Athens: Ekdoseis Alexandros, 2007.

Taxidis, Ilias. *A Pirate in Aitolia: The Logos of Constantine Akropolites on St Barbaros* (Byzantion BHG 220). Thessaloniki: 92, 2022.

Tomadakis, Nikolaos V. Προβλήματα της εν Κρήτη Αραβοκρατίας 826-961 μ.Χ. περί της δήθεν αλλοιώσεως του πληθυσμού εξ απόψεως εθνολογικής και θρησκευτικής [Problems of the Arab Rule in Crete 826-961 CE regarding the Alleged Alteration of the Population from an Ethnological and Religious Perspective]. Athens, 1960.

Tompaïdis, Dimitris. “Η τύχη των μικρασιατικών ιδιωμάτων στον ελληνικό χώρο” [The Fate of Asia Minor Dialects in Greek Territory]. Δελτίο Κέντρου Μικρασιατικών Σπουδών [Bulletin of the Centre for Asia Minor Studies] 9 (241–250), 1992. <https://doi.org/10.12681/deltiokms.138> (accessed April 15, 2025).

Tsakli, Vasileia. Η Έννοια Της Αυθεντικότητας Στο Χορό: Η Περίπτωση Του Ποντιακού Χορού Της Λετσίνας [The Concept of Authenticity in Dance: The Case of the Pontic Dance of Letsina]. Master's thesis, Open University of Cyprus, 2020.

Tserebelakis, T. Georgios. Ο Νικηφόρος Φωκάς και η Απελευθέρωση της Κρήτης από τους Άραβες [Nikiforos Fokas and the Liberation of Crete from the Arabs]. Athens: Ekdotikos Oikos Stamouli, 2009.

Tyronola, Vasiliki K. Ο Ελληνικός Χορός: Μια διαφορετική προσέγγιση [The Greek Dance: A Different Approach]. Athens: Gutenberg, 2001.

Vavritsas, Nikolaos G. Παραδοσιακοί χοροί και η διδασκαλία τους: ρυθμοκινητική ανάλυση και ρυθμική αρίθμηση [Traditional Dances and Their Teaching: Rhythmic Movement Analysis and Rhythmic Counting]. Thessaloniki: Vavritsas Nikolaos, 2018.

Weber, Bernhard. “Zwei Beispiele für Verbreitungsmöglichkeiten von Musik και Tänzen – innerhalb von sehr langen και sehr kurzen geschichtlichen Zeiträumen.” In Χορός και Ιστορία [Dance and History], Diethnis Organosi Laikis Technis, 2000.

Xanthoudidis, Stefanos. Επίτομος Ιστορία της Κρήτης [Abridged History of Crete]. Athens: Elliniki Ekdotiki Etaireia, 1909.

<https://anemi.lib.uoc.gr/metadata/2/8/8/metadata-367-0000002.tkl> (accessed April 15, 2025).

Zografou, Magda. Ο χορός στην ελληνική παράδοση [Dance in the Greek Tradition]. Athens: Athanasopoulos – Papalamis, 1999.

Zournatdzidis, Nikos. Συμβολή στην έρευνα του Ποντιακού χορού: χορευτικές διαδικασίες και χοροί του πόντου [Contribution to the Research on Pontic Dance: Dance Processes and Dances of Pontus]. Athens: Choreftikos Omilos Pontion “Serra”, 2025.

Zusammenfassung

Hintergrund: Traditionelle griechische Tänze dienen als Ort für kollektives Gedächtnis und regionale Identität, doch ihre charakteristischen kinematischen Eigenschaften wurden bislang noch nie systematisch quantitativ dokumentiert oder zwischen verschiedenen Regionen verglichen. Diese Lücke schränkt unser Verständnis davon ein, wie kulturelle Überlieferung verkörperte Bewegungstraditionen prägt, und verhindert einen systematischen Vergleich zwischen regionalen Merkmalen.

Zielsetzung: Diese Studie verwendet Motion-Capture-Aufnahmen von fünf traditionellen Tänzen (jeweils zwei Versionen pro Tanz) aus Kreta, Epirus und Pontos, um statistische Kennzahlen zu quantifizieren. Flüssigkeit, Komplexität, Durchschnittsgeschwindigkeit, mittlere absolute Beschleunigung sowie Hand- und Fußgeschwindigkeiten werden verwendet, um regionale Bewegungsmerkmale zu untersuchen.

Methoden: Die mit Motion-Capture-Technik erfassten Daten von sieben Probanden, die authentische traditionelle Tänze aufführten, wurden anhand von Messungen mit reflektierenden Markern verarbeitet. Die Komplexität wurde anhand der normalisierten Shannon-Entropie der PCA-zerlegten Trajektorien gemessen. Die Flüssigkeit wurde als Quotient aus der Durchschnittsgeschwindigkeit und der mittleren absoluten Beschleunigung definiert. Die statistischen Analysen umfassten einseitige Varianzanalysen, Welch- und Kruskal-Wallis-Tests, t-Tests für unabhängige Stichproben, Tukey-Post-hoc-Vergleiche und bootstrapped Konfidenzintervalle, um regionale Unterschiede und musikalische Einflüsse zu bewerten.

Ergebnisse: Regionale Muster waren über mehrere Metriken hinweg sehr ausgeprägt (Flüssigkeit über Regionen hinweg: $F(2,207)=104,66$, $p<0,001$, $\eta^2=0,50$; Komplexität über Regionen hinweg: Welch's $F(2,115)=3,16$, $p=0,046$). Epirus wies die höchste Flüssigkeit und die niedrigste Geschwindigkeit auf. Kreta

zeigte die schnellste Fußarbeit. Pontos zeigte eine dramatische Beschleunigung der Hände. Das musikalische Tempo modulierte die Bewegungsflüssigkeit stark ($t=17,10$, $p<0,001$, Cohen's $d=2,47$), während die Auswirkungen von ungeraden gegenüber geraden Taktarten subtiler, aber dennoch erkennbar waren. Alle Messgrößen zeigten eine hohe Konsistenz über mehrere Aufnahmen hinweg (Cohen's $d<0,2$), was die Zuverlässigkeit der Messungen bestätigt. Schlussfolgerungen: Die quantitative kinematische Profilerstellung bestätigt erfolgreich die Zuverlässigkeit der Bewegungserfassung zur Darstellung kultureller Biomechanik, die regionale Stile unterscheidet. Die derzeitige Methode bietet einen skalierbaren Rahmen für die vergleichende Tanzforschung, der anthropologische und biomechanische Perspektiven verbindet und neue Möglichkeiten für interkulturelle Bewegungsstudien und die digitale Bewahrung immateriellen Kulturerbes eröffnet.

Keywords: griechischer Volkstanz; motion capture; fluidity; complexity; PCA entropy