

# Historical European Martial Art in the spectrum of martial arts.

Part 1: What are Historical European Martial Arts and Historical Fencing and how do they fit in the spectrum of Martial Arts. A scoping review.

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## Abstract

**Introduction:** Martial arts and combat sports are a wide spectrum of sports and disciplines. The spectrum can be divided in several clusters, by origin and geography, content (Striking arts, grappling arts, armed arts, armored arts and others), by contact (non, limited, full) and goal (recreative, competitive, self-development, self-defense, etc.) **Aim:** The aim is to investigate the place of Historical European Martial Arts in the broad spectrum of Martial Arts and how it relates to other martial arts. **Methods:** A scoping narrative review of martial arts and Historical European Martial Arts. **Results and Conclusion:** Historical European Martial Arts is defined by its own properties and aspects that are defined by its origin, content, impact forms and goals. They are a cluster of martial systems developed in Europe and can be seen as the European counterpart of many comparable eastern martial arts such as a.o. the Japanese Budo and Chinese Wushu/kung fu with sometimes comparable techniques and with a variety of (often comparable) weapons. They can consist of grappling arts, striking arts, armed arts, armored arts and any combination thereof, depending on the discipline. Comparable to Budo, Wushu or other (Eastern) martial arts, some European martial arts also incorporate Kata-like drills, exercises, and plays. There are different contact forms ranging from non-contact with no protective equipment to full contact sparring and tournaments with a full set of protective equipment. Due to its own properties, it also has a specific injury profile. It deserves its proper place in the spectrum of martial arts and more research in the field of injury prevention is required.

**Keywords:** Historical European Martial Arts, Martial Arts, Historical Fencing, striking, kickboxing, grappling, armed martial art

## Introduction

### *Background*

Martial arts and combat sports are a wide spectrum of sports and disciplines. Generally they are a collection of technical applications, technicalities and aspects and applied physics to another human body in order to control the adversary, which are based on getting the opponent off balance (literally and figuratively) to neutralize the opponent or its threat, or to hurt or injure the adversary (Crowther, 2007; Elmore, 2020; Green, 2001; Wauters, 2021; Weimann, 1997). Many types of martial arts have been developing in many different parts of the world. When martial systems began to develop is very difficult to state, but earlier sources as ancient artwork and iconography like the tombs in Beni Hassan, Egypt (Crowther,

2007; David, 2003) or the rock art in Arnhem, Australia suggest that martial practice has been present for a very long time, perhaps 6000 to 10.000 years (Despraz, 2022; Tacon & Chippindale, 1994). However, with a lack of technical explanations, it is very difficult to determine how well these systems were developed or evolved. Warfare and the need to protection is present in all ages and eras. Prehistoric (Horn, 2013; Turek, 2017), ancient (Crowther, 2007; Green , 2001; Kristianse, 2002), medieval (Gevaert , 2016; Mardsen, 2016), renaissance or early modern (Gevaert , 2016; Mardsen, 2016) to modern and present ages ( Alemany et al., 2021; Motamedi, Ebrahimi & Askary, 2012) all have known war, warfare, violence and the need for (self) protection. All martial arts rely on the same application of anatomy and physics (Elmore, 2020; Ozkaya & Nordin, 1999; Wauters, 2021). Only the means, measures and materials used in martial arts change in time and place and are prone to evolution. This can be the consequence of general cognitive evolution (proceeding knowledge, mindset), technical evolutions (stronger materials, more efficient production process,...), or the needs and goals of a martial art (sport, self-defense, spirituality), et cet (Crowther, 2007; Elmore, 2020; Gevaert , 2016; Green , 2001; Mardsen R. , 2016; Turek, 2017; Wauters, 2021; Weimann, 1997).

Since martial arts are based on the same principles of physics and anatomy (Elmore, 2020; Ozkaya & Nordin, 1999; Wauters, 2021), it is more than normal that some of them closely resemble one-another. When looking more deeply martial arts can be divided into a few groups (Crowther, 2007; Elmore, 2020; Green , 2001; Papas, 2007; Tabben et al, 2014; Wauters, 2021; Weimann, 1997).

These groups are:

- Grappling forms
- Striking and kicking forms
- Armed forms
- Armored forms
- Others (mounted combat, etc.)

Most martial arts are hybrid forms of these factors. Of course, there are differences between martial arts in the groups themselves. English, French (Savate) or Thai Boxing (Muay Thai), for instance, all have other regulations and limitations about the allowed striking or kicking techniques being respectively only hands, hands and legs, or hands legs, elbows and knees (Green , 2001; Weimann, 1997). Judo and Jiu Jitsu differ in, among other techniques, the allowed joint locks (Green , 2001; Van Haesendocnk, 1994; Weimann, 1997). The differences can be for many reasons. Clothing, equipment, weapons, rules and regulations in sport settings, safety, historical evolution, tradition, etc (Crowther, 2007; Gevaert , 2016; Green , 2001; Weimann, 1997), but generally basic techniques will always be based on the same parameters: anatomy and applied physics (Elmore, 2020; Ozkaya & Nordin, 1999; Wauters, 2021). Basic human anatomy has not changed much over the last thousands of years (Higham et al, 2011). It consists of two arms, two legs muscles, ligaments, tendons, nerves and bones, all connected by specific joints that move in certain directions (regulated by anatomical structures and physics). An elbow or wrist, for instance, has a specific range of motion in specific directions generated by muscles and tendons with the coordination of nerves. This is also why some historical martial arts or martial arts in general are complementary sports and training in one might or can be beneficial for results in another (Obminski et al, 2016; Szafranski & Boguszewski, 2015; Vrijens, Bourgeois, & Lenoir, 2007)

Historical European Martial Arts (*HEMA*) are a mix of historical martial systems in Europe. Historical Fencing (HF) is the armed subcategory like fencing with the messer, arming sword, rapier, longsword, and many others. It can be compared with and seen as the European counterpart of armed and unarmed eastern martial arts or systems like the Japanese *Budo*, and despite some differences there are a lot of similarities (Forgeng, 2015; Forgeng, 2018; Gevaert, 2016; Jaquet et al, 2015; Jaquet & Walczak, 2015; Mardsen R., 2016; Wauters & Vantiggelen, 2016; Wauters, 2020; Wauters, 2021; Weimann, 1997).

### ***Purpose***

This series of papers fits into a larger project on injuries and their prevention in HEMA. The aim of this paper is to delineate the position of HEMA in the spectrum of martial arts.

## **The spectrum of Martial Arts**

Martial arts (M.A) are a broad spectrum of sports, arts and disciplines. The profile of a M.A. is defined by its origin (geography), content, impact form, goal, benefits, and injuries.

Generally, martial arts/sports and combat art/sports can be divided in several clusters or groups, by ***geography*** (Fig 1) (Crowther, 2007; Green, 2001; Weimann, 1997), like Japanese Budo, Chinese Wushu, Filipino martial arts, Western Martial Arts, Historical European Martial Arts etc, or by ***content*** (fig 2) (Crowther, 2007; Green, 2001; Tabben et al, 2014; Wauters, 2021; Wauters, 2022; Weimann, 1997) like striking arts, grappling arts, armed combat, armored combat or others. Some styles are very focused on one aspect such as boxing (striking), Judo (grappling), or Kendo (armed & armored), others can have combinations of different aspects. Another way to divert is by ***impact/contact*** form (Brudnak et al, 2002; Crowther, 2007; Green, 2001; Miller et al, 2022; Origua Rios et al, 2017; Weimann, 1997) such as low impact/soft styles to high impact/full contact/hard styles. There is some discussion about differences between combat and martial disciplines and sports or art disciplines in this setting. Whether a discipline belongs to a martial art, martial sport, combat art or combat sport is beyond the purpose of this review. The properties of a martial art (content and impact form) will determine its ***goal***. There are forms that only train for recreational purposes, without competition while others mainly or only focus on competition. There are the ones that are focused on health (Brudnak et al, 2002; Miller et al, 2022), on sport (Bruke et al, 2005; Channon & Jennings, 2014; Zetaruk et al, 2005), on self-defense in professional (Bugala et al, 2016; Channon & Jennings, 2014) and/or civilian life (Channon & Jennings, 2014; Staller & Abraham, 2016), law enforcement and/or military combat (Alemany et al., 2021; Siedlik et al, 2021) or only for the purpose of personal (Channon & Jennings, 2014; Dodd & Brown, 2016) or spiritual development (Brown et al, 2022; Dodd & Brown, 2016) and even therapy (Bruke et al, 2005; Savard, 2017).

### ***Geography***

Many different martial arts have developed in specific geographical regions. Japanese Budo, Chinese Wushu, Russian martial arts, Filipino Martial Arts, African martial arts, are only some of the many examples. Often the content is directly linked to the geographical region, time, spirit of the age, rules and laws of the given time etc. Modern Japanese Budo are often participated in a traditional kimono representing the traditional Japanese clothing. Karate-(do) means (by the means/way of) the empty hand and was originally a form of self-defense in a time that wearing or wielding arms was forbidden (for certain people) (Crowther, 2007; Green, 2001; Weimann, 1997).

## Content

In terms of content, there are **armed** or unarmed forms (fig.2). Armed martial arts like Kendo (Green , 2001; Schultzel et al, 2016), Kenjutsu (Green , 2001; Sakaue, 2018), Iaido/iaijitsu (Green , 2001; Okamoto & Adachi, 2015), Tankendo (Nakamura & Hoshino, 2019), Jukendo (Nakamura & Hoshino, 2019), Naginatado/jitsu (Nagy, 2015) and Olympic fencing are mainly focused on the use of a weapon. Sometimes no, or only a very limited amount, of grappling or striking techniques is allowed. The use of weapons in martial arts can be very broad and versatile: daggers (Jiu-Jitsu, Krav Maga, Tantojitsu, Tankendo), one-handed/short swords (wushu, tai chi, modern fencing, Tankendo), two-handed/longsword (Kendo, Kenjutsu, Iaido/jitsu) to polearms, spears, halberd, long sticks or other pole arms(sodo/sojitsu, naginata-do/jitsu, jodo/jitsu, wushu, tai chi, etc. (Crowther, 2007; Green , 2001; Kumar & Mishra, 2015; Weimann, 1997) . Styles like mounted combat and fighting on horseback is performed very rarely in modern setting and are done in Hema-Ross fechten or Budo-Bajutsu.

Figure 1: Geographical subdivisions of martial arts:



In unarmed form *striking/punching arts* (Crowther, 2007; Green , 2001; Wauters, 2022; Weimann, 1997) and *grappling arts* (Crowther, 2007; Green , 2001; Wauters, 2022; Weimann, 1997) can be distinguished. These disciplines do not use weapons in their modern forms (anymore). This is either because the historical precursor of the martial art did/does not use or allow arms (e.g. Karate) or, that modern setting does not allow the use of arms in their “modern form” (e.g. Judo). However, in some Kata or other forms of orchestrated fighting situations, the use of weaponry or can still be present (e.g. Judo) (Crowther, 2007; Green , 2001; Wauters, 2022; Weimann, 1997). **Striking arts** mainly focus on punching and kicking. Depending on the system this can be only hands e.g. modern English Boxing (Crowther, 2007; Green , 2001; Wauters, 2022; Weimann, 1997) hands and legs e.g. Savate, French Boxing (Kochar et al, 2004; Southwood & Delamont, 2018), hands, legs, knees and elbows e.g. Muay Thai, Jiu-Jitsu, some styles of Karate (Crowther, 2007; Green , 2001; Weimann, 1997) or even combined with headbutts like in Lethwei, some styles of combat sambo or others (Crowther, 2007; Dodd & Brown, 2016; Green , 2001; Kochar et al, 2004; Southwood & Delamont, 2018; Weimann, 1997)

Figure 2: content of martial arts:

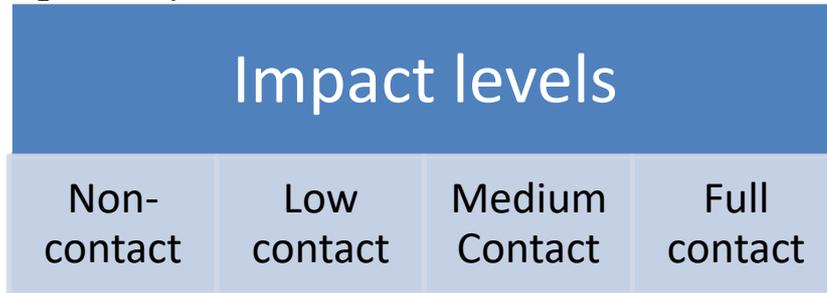


**Grappling arts** mainly focus on grappling techniques such as throws, sweeps, joint locks, controlling techniques, submissions and choke techniques without striking techniques. Some martial arts did/do have striking techniques in their earlier forms, but they were excluded in their “modern form” for a variety of reasons. This can either be for safe competitions or other reasons (Jiu-Jitsu Vs Judo, Kenjutsu vs Kendo, et cet) (Crowther, 2007; Green , 2001; Wauters, 2022; Weimann, 1997). As said this distinguishing (Striking/Grappling/Armed) is arbitrary and artificial in a way. Historically speaking many martial arts are/were **hybrid** forms using a variety of weapons, striking/punching and grappling techniques and numerous present day martial arts are still hybrid forms (e.g. Aikido, Jiu-Jitsu, some styles of Karate, Kenjutsu, Hapkido, Combat Sambo, Sanda, Wushu, etc.) depending on their origin, development and evolution (Crowther, 2007; Dodd & Brown, 2016; Green , 2001; Kochar et al, 2004; Southwood & Delamont, 2018; Weimann, 1997). Thus, separation of martial arts in this way by content (armed/unarmed, striking, grappling) is artificial and for classification purposes only.

### **Contact form**

Further, there is the differentiation in impact forces and contact forms (fig 3). Many martial arts can be divided in either soft/ non-contact/stylized (e.g. Tai Chi, Capoeira, Iaido, Tameshigiri), light contact and impact (some forms of Tai Chi, some types of Kenjutsu), medium contact and impact (e.g modern fencing) to full contact like some styles of Karate, Muay thai, tae kwon do, boxing et cet. (Bruke et al, 2005; Critchley et al, 1999; Crowther, 2007; Green , 2001; Lystad, 2015; Lystad et al, 2020; Strotmeyer & Lystad , 2017; Weinman, 2006). Non-contact forms do not allow any form of contact in their practice and therefore (some) do not have any form of sparring (e.g.. Iaido, Tameshigiri,... ). Some of them might be evolved into more stylized forms (Tai Chi, Qi Gong,...). Other martial arts only allow low or medium contact (e.g. some styles of Tai chi) while others mainly, but not only, train in medium to full contact (Muay Thai, Savate, Sanda, Combat Sambo, Karate, Tae kwon do,...). Some martial arts might have more than one impact form depending on the (traditional) way of training, competing, or performing e.g. Karate, Kendo, Jiu Jitsu, Judo, Wushu varying from no or limited contact to full contact (Bruke et al, 2005; Critchley et al, 1999; Crowther, 2007; Green , 2001; Lystad, 2015; Lystad et al, 2020; Strotmeyer & Lystad , 2017; Weinman, 2006). Injuries in general tend to be more severe and more frequently present if contact and impact forces increase rather than contact hours of training alone (Brucke 2007, Critchley, 1999; Lystad, 2015; Kujala, 1995; Tsang et al 2008). The laws of mechanics dictate that energy transfer in unrigid/deformable objects and bodies can cause deformation of the object or body. Elastic deformation means that after (light) stress, strain or impact the object regains and retains its original structure and form. When the force or energy increases above a certain point, this elastic deformation evolves into plastic/permanent deformation. This is when damage to the object occurs. This same principle applies in human tissue as well. This damage to tissue is an acute injury. Small deformations can lead to minder deformation such as bruises (deformation of the blood vessels). Large deformation after impact or stress can lead to significant damage and injury of structural tissue such as broken bones, torn muscles, torn ligaments, visceral or brain damage etc. The greater the impact on an object or body, the greater the amount of energy that is transferred in and through the object/body, resulting in deformation, damage, or injury (Hamil & Knutzen, 2009; Ozkaya & Nordin, 1999; Schunke et al, 2010). Thus, preventive measures have to be with attention to this parameter (Wauters S. & van Tiggelen D., 2016; Wauters, 2022). Tai Chi for instance can have a high number of training hours, yet the impact is very limited resulting in less risk of injuries.

Figure 3: Impact and contact forms.



### *Armored*

In case of armed types there are armored such as Kenjutsu, Kendo (Green , 2001; Nakiri, 2019; Schultzel et al, 2016; Yamamoto et al, 2013) and unarmored such as Iaido, Wushu, Olympic fencing (Crowther, 2007; Green , 2001; Kumar & Mishra, 2015; Lu, 2008; Okamoto & Adachi, 2015; Weimann, 1997).

### *Kata, plays and stylized forms*

Another very important aspect of many martial arts are stylized forms like Kata and other orchestrated forms and plays. These stylized forms and/or orchestrated plays are in many ways part of the style or discipline. They can have many purposes from didactical in a technical or self-control way, spiritual, practical (less impact or predictable movements), tradition, physical training, safety, etc. Depending on sport or discipline it can be performed solo, duo or even with multiple opponents. In some disciplines, it is the only way of performing. It differs from shadowboxing and flow practice that are more improvised combination of techniques that can/could be different in every training session or practice, whereas Kata(-like) practice always involves the same orchestrated movements where the technicalities, accuracy, precision, performance, speed etc, have to be very precise. It can be found in many martial arts such as Judo, Kendo, Karate, Kenjutsu, Iaido/jitsu, Naginata-do/jitsu, Tanto-do/jitsu, Wushu, Tai Chi, etc. Other styles might be less orchestrated but nevertheless stylized (smooth and without resistance by the opponent) such as in Aikido and Tai chi (De Cree & Jones, 2011; De Cree, 2013; De Cree, 2015; Dodd & Brown, 2016; Green , 2001; Kumar & Mishra, 2015; Massuca , 2014; Tutor , 2021; Weimann, 1997).

### *Benefits and injuries*

Martial arts can have many health benefits in children (Stamenkovic et al, 2022), adults (Moore et al, 2021) and elderly people (Brudnak et al, 2002) but like any sport it is prone to injuries (Bolach et al, 2016; Papas, 2007; Zetaruk et al, 2005). Research suggests though that, depending on type of martial art, intensity of practicing and type of practicing, martial arts do not lead to more injuries than other common sports though. Each martial art has its own injury profile, injury presentation, injury risk and injury mechanism (Bolach et al, 2016; Papas, 2007; Zetaruk et al, 2005). The **profile** is the types of injuries and locations of injuries that occur within a given martial art. These types of injuries vary from martial art to martial art (Bolach et al, 2016; Papas, 2007; Zetaruk et al, 2005) and even within age (Baldwin, 2019; Macan et al, 2006), sports level (beginner, advanced, amateur or professional) (Boguszewski et al, 2013; Garcia-Isidoro et al, 2020) and gender (Boguszewski et al, 2013; Garcia-Isidoro et al, 2020). The **risk** of injury is how often injuries occur. It can

be calculated and measured in a variety of ways like the total amount (Arriaza et al, 2009; Macan et al, 2006), the injury rate per exposure time (Arriaza et al, 2009; Macan et al, 2006) or per combat bout (Arriaza et al, 2009; Macan et al, 2006). The **injury type and injury mechanism** are closely related and is specific for certain types of martial arts. This is because every martial art has its own properties. While *joint locks* in Judo and Sambo are quite common, they are forbidden in Karate and boxing, therefore shoulder hyper rotation, elbow hyper extension injuries, sprains and strains will be more common in grappling arts than in striking arts, and if they occur, the mechanism will be different (Lystad, 2015; Lystad et al, 2020; Papas, 2007). In case of impact injuries, martial arts that incorporate striking and kicking are prone to other types of injuries than grappling arts. Head and face injuries tend to occur more often in striking arts than in grappling arts, due to the impact force of the strikes that is present in striking arts and not in grappling arts. Head injuries and concussions do occur in grappling arts as well but have another injury mechanism (fall to the head) (Lystad, 2015; Lystad et al, 2020; Papas, 2007). Leg injuries are also more common in martial arts that incorporate kicking techniques (Savate, Muay Thai, Tae Kwon Do,) compared to striking arts that do not permit kicks (e.g. modern English Boxing). This is simply due to the fact that legs are on the giving and receiving end of the impact force of kicks and that legs are almost never targeted in English Boxing (Lystad, 2015; Lystad et al, 2020; Papas, 2007). Some grappling arts might also have more leg injuries than other if they incorporate joint locks (e.g. Judo vs Brazilian Jiu-Jitsu) but these have other injury mechanisms and presentation than striking arts that incorporate kicks (Lystad, 2015; Lystad et al, 2020; Papas, 2007). Hand injury presentation in grappling arts is also different than in striking arts since they are obtained by another injury mechanism. Striking arts have other hand impact forms than grappling arts resulting in other specific injuries such as the boxing fracture (Lystad, 2015; Lystad et al, 2020; Papas, 2007). Injury profiles and injury presentation can differ between martial arts due to their specific properties or rules. When rules within a certain martial art change, it can lead to a different injury profile, since rules will affect whether certain (injury provoking) techniques will be used more or less frequently (Arriaza et al, 2009; Kruszewski et al, 2014; Lystad, 2015; Lystad et al, 2020; Macan et al, 2006). It appears that injury rates in Mixed Martial Arts and other hybrid (competitive) forms are the highest. This might be due to the fact that these types of martial arts incorporate different styles (striking, grappling and sometimes armed combat) (Lystad, 2015; Lystad et al, 2020; Papas, 2007). One major contributing factor is intensity, impact force, and deforming energy. While MMA competition has a very high injury rate, even greater than other full contact arts (Ross, 2021), Tai Chi has a very low injury risk and rate compared to (full) contact arts (Zetaruk et al, 2005).

## **HEMA in the spectrum of martial art**

Hema has its **origins** in modern day western and central Europe. It is hybrid martial art containing many different styles and **content** that (can) contain striking arts, grappling arts, arms and even armor. There are variations **contact forms** such as non-, limited and full contact and consists of a variety of armed/unarmed and armored/unarmored combat techniques with a variety of **arms** like the one-handed arming sword, side sword, langes messer or long knife (all single use or in conjunction with a shield or buckler) and the rapier (either single, with dagger, buckler or cloak), the one-handed saber, the dagger, the two-handed longsword and great sword, and pole weapons in different styles and forms, all in both

Figure 4: Longsword fencing Left Longsword fencing in tournament (FEF). Right Longsword fencing in minimal equipment(MEF)



unarmored and armored settings (fig.4-10) (Crowther, 2007; Gevaert , 2016; Green , 2001; Jaquet et al, 2015; Jaquet & Walczak, 2015; Mardsen, 2016; Wauters & Vantiggelen, 2016; Wauters, 2022; Weinman, 2006). There are records and **settings** of mixed or unequal weapons, multiple opponents, or mounted combat. Almost all these martial systems can be combined with close-combat grappling techniques, In this perspective HEMA can be compared to the Japanese Budo wherein every discipline has its own value and properties with sometimes overlapping content. There are the **unarmored** disciplines/variants (Blöss fechten, dagger, unarmored one-handed sword fencing, unarmored two-handed longsword fencing, etc.) and **armored** disciplines (Harnish fechten with longsword or polearms etc.). Some technical aspects of the earlier (late antique, Medieval, and Early Modern) European settings and sources are comparable to Sumo, Judo/Jiujitsu, Tankendo for short sword or knife fencing, and even Jukendo for the bayonet fencing styles.

**Armored** variants consist of different techniques than unarmored disciplines simply because the body is well protected by armor thus the techniques involve attacking “weaker” or exposed body parts. HEMA, for instance, consists of a lot more half-sword techniques (that go to the openings of the harness) than blöss fechten does (Crowther, 2007; Gevaert , 2016; Green , 2001; Jaquet et al, 2015; Jaquet & Walczak, 2015; Mardsen, 2016; Wauters & Vantiggelen, 2016; Wauters, 2022; Weinman, 2006).

**Origin and content** are, as on other marital arts, very related. The original and early forms of Hema involve swift sword strikes, thrusts and cuts with a rather rigid and heavy blade with medium to full contact forces, grappling techniques and in some cases boxing and kicking techniques (Crowther, 2007; Green , 2001; Forgeng, 2015; Hagedorn, 2008; Murgu, 2006; Weinman, 2006) This could have been in a variety of settings such as self-defense, recreation, tournament and competition, or other. Modern day practice tries to replicate that setting as much as possible which are all not allowed in modern Olympic fencing (foil, epee and sabre) (Harmer, 2008; Murgu, 2006). Therefore, the early forms of HEMA are probably, in terms of these technical factors, content and aspects (not in terms of lineage), closer comparable to hard style of martial arts like Kendo, Judo, Jiu Jitsu etc. than to modern Olympic Fencing. In terms of later (Early Modern to modern) sources, settings and fencing systems that involve the rapier, small sword and saber HEMA can be seen as the predecessor from modern fencing that evolved from the single-handed (arming and side) sword to the rapier and “smallsword”, eventually into modern fencing, although modern Olympic Fencing still has less impact forces to endure (Crowther, 2007; Deutscher et al, 2019; Gevaert , 2016; Green , 2001; Murgu, 2006).

Figure 5: Single rapier fencing. Left fencing postures, right, wrestling action.



Different styles in different time periods and places in Europe have been developed and evolved (Crowther, 2007; Deutscher et al, 2019; Gevaert , 2016; Green , 2001; Murgu, 2006). In Medieval and Early Modern (Renaissance) Europe for example there are the so called “German” tradition, the “Italian tradition, the “English” tradition, etc. The martial techniques are written down in historical fencing manuscripts and many teachers and instructors use these manuscripts for their technical aspects. Yet interpretations of these manuscripts should be done in the sociocultural mindset of the given time. (Chidester & Hagedorn, 2021; Forgeng, 2015; Forgeng, 2018; Gevaert , 2016; Green , 2001; Hagedorn, 2008; Hagedorn, 2017; Hagedorn, 2021; Jaquet et al, 2015; Jaquet & Walczak, 2015) (Mardsen, 2016; Offenber, 2018; Wauters & Vantiggelen, 2016; Weimann, 1997) In contrast to historical reenactment and Buhurt, HEMA uses modern protective equipment (photo5-10) such as a modern fencing helmet, throat protector, padded fencing jacket, heavy duty fencing gloves, padded fencing pants, hard shell shoulder, elbow, knee, shin and underarm protection and groin protector. In some cases, a scumcap and/or mouthguard are used for extra protection.

As for the **impact forms**, depending on style and intensity, different equipment is used. There is a wide spectrum regarding impact forces, varying from no contact/impact to full contact, comparable to other martial arts. Non-contact fencing (NCF) does not allow contact between the fencers, so there is no/less need for protection. In medium contact fencing (MCF) more protection is needed to fence safely with a minimal risk of injuries (photo 6). Commonly used equipment includes a fencing helmet, throat protector and light fencing gloves. Full contact fencing (FEF) and tournaments require the full set of protective equipment (photo 5-10).

Figure 6: Fencing with the shield. Left late Iron age/Early medieval round shield (MEF). Right Medieval heater shield (MEF)



Figure 7: left Longsword fencing in tournament, wrestling action. Right saber fencing in tournament.



Modern tournaments are held in a variety of settings. They range from stylized Kata-like performance tournament (as known in many eastern martial arts such as Karate-do, Kendo, and Judo), cutting performance tournaments (such as seen in Iaido and Tameshigiri), medium contact (such as seen in Kenjutsu, and medium impact striking/kicking martial arts) to full contact tournaments fencing tournaments (like seen in Kendo).

Regulations in full contact tournaments differ from organization to organization. To date, the most common setting is the following: 3-to-5-minute rounds with multiple exchanges. Points can be gained by hitting, either with a cut, thrust or slice. Generally, the head values two or three points, torso two to three points, and upper arm and leg one to two points, lower arm/leg and foot/hand, zero to one point, but variations are possible. Paired drills and Kata-like performance, individuals or teams are judged on their performance of certain techniques. Skills such as timing, speed, accuracy, technical performance, footwork, blade work etc. are scrutinized as is often seen in other martial arts (e.g. Judo, Karate, Jiu-Jitsu, kendo,...). Often there is a certain play or flow selected by the tournament organization and informed to the participants several weeks before the tournament. In the tournament the selected plays are performed by the participants and judged by the jury.

HEMA can be considered a general safe combat sport, however, **injuries** are possible, and it also has its own **injury profile, mechanisms** and **presentation**. Few research is done on this topic. Own research found that the injury profile is unique compared to other Martial Arts. The injury mechanism of a specific injury type, the swordsman's thumb, is unique to this type of martial arts due to the used weapons, arms, materials and protective equipment. Other injuries as ankle, hand, and shoulder injuries are the most common site. Protective equipment in this part seems to be challenging. Helmet fitting and gloves protective properties and mobility are a problem. More research is necessary(Wauters, 2016; Wauters, 2022;Wauters, 2023).

Figure 8: Single arming sword/Messer fencing. Left. fencing action, Right wrestling action.



Figure 9: Swprd and buckler fencing: Left Mef- fencing, Right Fef fencing



## Conclusion

Historical European Martial Arts is defined by its own properties and aspects that are defined by its origin, content, impact forms, and goals.

They are a cluster of martial systems developed in Europe and the European counterpart of many comparable eastern martial arts like a.o. the Japanese Budo and Chinese Wushu/kung fu with sometimes comparable techniques and with a variety of weapons.

HEMA can consist of grappling arts, striking arts, armed arts, armored arts and any combination thereof, depending on the discipline. Comparable to Budo, Wushu or other (Eastern) martial arts, some European martial arts also incorporate Kata-like drills, exercises, and plays.

There are different contact forms ranging from non-contact with no protective equipment to full contact sparring and tournaments with a full set of protective equipment. Due to its own properties, it also has a specific injury profile. It deserves its proper place in the spectrum of martial arts and more research in the field of injury prevention is required.

Figure 10: other styles: Left Shield and spear fencing, combination of MEF and FEF. Right Dussac fencing in tournament(FEF)



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## Appendix

Table 1: various styles of martial arts (non-complete list)

Martial group	Martial art	Origin	S/D/M	Impact form	Technical focus.	Also contains
<b>Budo/ Bujitsu</b>	Karate(-do)	Japan	S/D	No to full	Striking and kicking	grappling
	Judo	"	D	Low to full	Grappling	-
	Jiu-Jitsu	"	S/D	Low to full	Striking,kicking,grappling, armed	-
	Kendo	"	D	Low to full	Fencing	-
	Kenjutsu	"	D	No to full	Fencing	Striking, kicking, grappling
	Aikido/aikijitsu/Battojitsu	"	D	Low to med	Grappling	Striking, kicking, armed
	Aikibudo	"	D	Med to Full	grappling	-
	Iaido	"	S	No	Fencing	-
	Sumo	"	D	Low to full	Grappling	-
	Ninjitsu	"	D	Low to full	Striking, kicking, grappling, armed	-
	Naginata-do/-jitsu	"	S/D	Low to full	Polearm fencing (naginata)	Grappling
	Sodo/Sojitsu	"	S/D	Low to full	Polearm fencing (spear)	Grappling
	Jodo	"	S/D	No to med	Stick fighting	Grappling
	Tantojitus/ Tankendo	"	S/D	Low to med	Fencing with the dagger	Grappling
	Jukendo/-Jitsu	"	S/D	Low to Full	Bayonet fencing	grappling
	Tameshigiri	"	S	No	Cutting performance on tatami	Grappling
	Bajisu	"	S/D	-	Mounted combat	Sword, Speer, Grappling,
	Kenpo/Kempo	"	S/D	Low to Full	Striking and Grappling	Grappling
	Kusarigamajutsu	"	S/D		Sickle fencing	Grappling
	Bodo/jitsu	"	S/D			
others						
<b>HEMA</b>	Bronze-Iron age	Various parts of Europe	S/D/M	No to full	Fencing: late ancient onehanded sword or spear	Grappling, Striking, Kicking
	Early Medieval sword	"	S/D/M	No to full	Fencing: One-handed early Medieval sword	Early Medieval (great) shield Grappling, Striking, Kicking
	Arming sword	"	S/D/M	No to full	Fencing: one-handed (arming) sword	Buckler, heater shield, dueling shield
	Langes messer/ Falchion	"	S/D/M	No to full	Fencing: Long knife/(Langes) messer	Buckler, grappling
	Side sword	"	S/D/M	No to Full	Fencing: Side sword/spada da lato	Buckler, grappling, shield/rotella
	Rapier	"	S/D/M	No to full	Fencing: Rapier	Dagger, buckler, cloth
	Small sword	"	S/D/M	No to full	Fencing: Small sword	-
	Saber	"	S/D/M	No to full	Fencing: Saber	-
	Spear/Partisan	"	S/D/M	No to full	Fencing: spear	Grappling
	Other pole weapons	"	S/D/M	No to full	Fencing: pole weapons	Halberd, glaive, etc., grappling
	Ross fechten	"	D	Low	Fencing: mounted combat	Grappling
	Bare knuckle fighting	"	D	No to full	Striking, Kicking Grappling	-
	Dagger	"	S/D	Low to full	Fencing: Dagger	Grappling
	Ringen/wrestling	"	D	Low to full	Grappling	-
	Bayonet fencing	"	D	Low to med	Fencing with the bayonet and rifle (not shooting)	Grappling
	(single) stick fighting	"	D	Low to full	Fencing: (single) stick	Grappling
	Other weapons	"	S/D/M		Scythe fencing, sickle fencing, mace/club	Grappling

Table1: continue.

<b>Chinese martial arts (Wushu)</b>	Wushu and Kung-fu (very broad in styles)	China	S/D/M	Non to Full	Depending on style Striking, Grappling and Armed.	Different styles focus on different arts and techniques.
	Sanda & modern wushu	"	D	Medium to full	Striking and grappling	-
	Tai Chi/Chi gong/ etc. (very broad in styles)	"	S/D	No to low	Depending on style Striking, Grappling and Armed.	Different styles focus on different arts and techniques.
	Others (wing chun, etc.)					
<b>Striking styles</b>	Boxing	England	S/D	Low to full	Striking: mainly hands	Grappling not allowed
	Savate	France	S/D	Low to Full	Striking: mainly hands and feet	Grappling selectively allowed: clinching and swiping.
	Muay Thai	Thailand	S/D	Low to Full	Striking: Hands, elbows, knees and feet, art of eight limbs	Grappling: clinching and swiping.
	Lethwei	Myanmar	S/D	Low to full	Striking: Hands, elbows, knees, and feet, headbutts, art of 9 limbs	Grappling: clinching, swiping, and throwing.
	Capoeira	Brazil	S/D	Non	Stylized movement of punching and kicking.	-
	Vale Tudo	Brazil	D	Full	Hands, elbows, knees and feet.	-
	Tai kwon do	Korean	D	Low to full	Striking, kicking	-
	Hapkido	Korean	D	Low to full	Striking kicking	Grappling
	Hopak	Ukraine	D	Low to full	Striking kicking	Grappling
	Others					
<b>Grappling styles</b>	Brazilian JiuJitsu	Brazil	D	Low to full	Grappling	-
	Greco-Roman wrestling	Ancient Greece/Rome	D	Low to Full	Grappling	-
	Sambo	Russia	D	Low to Full	grappling	-
	Glima	Iceland	D	Low to Full	Grappling	-
	Yalgi	Turkey	D	Low to Full	Grappling	-
	Schwingen	Switzerland	D	Low to full	Grappling	
	Mushti	India	D	Low to full	Grappling	-
	Mongolian wrestling	Mongolia	D	Low to Full	Grappling	
	others					
<b>Modern fencing</b>	Foil	French	D	Low to med	Fencing	-
	Epee	"	D	Low to med	Fencing	-
	Saber	"	D	Low to med	Fencing	-
	Other styles of fencing					
<b>Other</b>	Krav maga	Israel	D/M	Low to Full	Striking, kicking, grappling	Armed fighting and self defense
	Pankration	Ancient Greece	D	Low to full	Striking, kicking, grappling	-
	Filipino martial arts	Philippines	S/D	Low to full	Striking, kicking, grappling, armed	-
	African martial arts	Continent of Afrika	S/D	Low to full	Striking, kicking, grappling, armed	-
	Combat sambo	Russia	D	Low to Full	Striking kicking grappling	-
	Systema	Russia	D	Low to Full	Striking kicking grappling	armed fighting and self defense
	Hankuk Haedong Kumdô	Korea	D	Low to Full	Fencing.	
	Jeet Kune do	Hybrid style	S/D/M	Low to Full	Striking, kicking, grappling, armed	
	Other					

**Legenda: S= solo, D= Duo, M= Multiple opponents**

## **Tables**

Table 1	Various styles of martial arts (non-complete list)
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## **Figures:**

Figure 1	Geographical subdivision of Martial Arts
Figure 2	Content of Martial Arts
Figure 3	Impact and contact forms
Figure 4	Longsword fencing
Figure 5	Single rapier fencing
Figure 6	Fencing with the shield
Figure 7	Longsword fencing & saber fencing
Figure 8	Single arming sword/messer fencing.
Figure 9	Sword and Buckler fencing.
Figure 10	Other styles.