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# Anger, Action and Hope: A Picture of Islamist Terrorists by Means of Qualitative Research, Sentiment Analysis and Machine Learning

**Dr. Gianluca Tirozzi**

*Sapienza University of Rome*

## Abstract

This study is a qualitative and interpretative research that starts from a self-ethnographic work performed by the researcher thanks to his experience as a counterterrorism intelligence operator. The chosen technique is a content analysis aimed at detecting and evaluating the sentiment of a series of wiretapped conversations in a criminal proceeding made by the Italian Law Enforcement. For this purpose, the criminal investigation documents have been analysed following two approches, a traditional human analysis of contents and a technological one made by using the computer. In accordance with the new Information Technologies (IT), as that of Artificial Intelligence (AI), we produced a digital "emotional categorization" of the emerged sentiment. The aim of the research is to establish, thanks to a non-intrusive approach, whether and to what extent there is a spectrum of sentiments which characterizes the typical mood of terrorists. So, giving elements for establish a communicative channel between Intelligence, Security Forces on one hand and the terrorists on the other.

## INTRODUCTION

More and more often the use of technology gives us the feeling of being able to dominate the future. The development of information technologies has allowed the management of a considerable amount of data and has led many scholars to look for a way to exploit this evolution in the predictive as well as in the evaluative field (Epstein, 2006; Sato, 2014; Bruno et al. 2016). Among these new scenarios, counterterrorism appears to be one of the privileged areas in which to test the predictive capabilities of computers (Dugan and Distler, 2016). One of the simplest and easiest ways to do so, even by scholars belonging to the fields of human sciences, is the sentiment analysis. Sentiment analysis is an important field of study in natural language processing. In the massive data and irregular data, sentiment classification with high accuracy is a major challenge in sentiment analysis (Rajput, Chauhan, 2019). Therefore, its study could allow counter-terrorism operators to intervene in communications with jihadists and other terrorists, such as in emergency negotiations or mediation activities.

Numerous studies that have applied this method to written texts available in virtual public spaces found in social media services, such as Facebook, Twitter, Instagram, etc., have emerged from the recent literature review (Oh et al. 2011; Klausen, 2015; Benigni, and Carley, 2016; Garg, Garg, and Ranga, 2017; Cunliffe, and Curini, 2018; Ahmad, et al.

2019;). These are activities that, although not intrusive, draw on communications originated and conveyed through those filters and those typical criteria of public communication (Bonetti et al. 2010; Martin and Nakayama, 2013). However, much rarer are those studies that have applied this analytical tool to the transcriptions of the dialogues between subjects of study (Muralidhar, 2013). But in most of these cases, the analyzed sample was the result of intrusively acquired dialogues, given the interlocutors' total or partial awareness of being the subject of study.

For the above reasons, the intention of this work has been to apply the Sentiment Analysis without any predictive purpose but only as a governance tool (Kumar et al. 2015; Kumar and Joshi, 2017; Dwivedi et al. 2019). This is a straightforward way to think of new effective operative scenarios which could implement such kind of technology. One must imagine a tool capable of capturing the real-time sentiment and emotional status of individuals, for instance after having transcribed a conversation, such as a phone conversation between a terrorist and a police officer. This would undoubtedly provide useful feedback to the field worker. In fact, thanks to the rapid analysis carried out by the computer, this could be an additional tool in support of human activities that, in any case, must always remain predominant.

This study was possible to conduct by using Sentiment Analysis, a particular type of content analysis (Azizan and Abdul Aziz, 2017) which is becoming one of the most attractive topics, along with machine learning, for those involved in computer sciences (Feldaman, 2013). The predictive expectations on this kind of studies are increasingly high but, in my opinion considering the actual stage of Artificial Intelligence's technologies (He and Wang, 2019; Xua et al. 2019), they are more concrete for the governance processes, based on facts read in retrospect. To this purpose, an "R library" was used, called *Textwiller* (Solari et al. 2016), which allowed us to apply this content analysis tool, in an absolutely "non-intrusive" way, on Italian words.

The above was found in the present writer's ethnographic background, based on a twenty-year's experience as an anti-terrorist operator, an appropriate context to find out the data sources from well-known intelligence activities. In fact, the last Italian investigation on the local Al Qaeda's branch[1] was carried out by the present writer between 2006 and 2009. The investigation had started precisely to identify possible clandestine financial routes with the connivance between human traffickers and terrorist organizations in North Africa. These were the years of the second life of Al Qaeda, after its transformation from a criminal organization to a global threat, to a logo.

We therefore wanted to understand whether a "normless" condition of young islamists, as emerges today from the scientific literature on the psychological and emotional condition of shahids (Barum, 2011; Cottee, 2011; Bowman-Grieve, 2013; Fiske, 2013; Postel, 2013; Kruglanski, et al., 2014; Goerzig and al-Hashimi, 2015; Berger, 2016; Cruz et al. 2019), could have a confirmation from the above described analysis' technique.

In trying to understand if and to what extent a communication with terrorists aimed at counterterrorism is possible, detecting the emotional states of terrorists, I tried to add to theoretical knowledge the experience of fieldwork. The terrorist must be therefore

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[1] [1] Registered at nr. 17681/07 R.G.N.R. of the Prosecutor Office of Bari (Italy).

understood as an individual whose personal *Jihad*[2] (effort) must be the search for the achievement of the balance of three logics based on social action: belonging; integration; subjectivation (Dubet, 2014).

This research originates precisely from here: the phenomenon of terrorism dealt from the point of view of the individual plan in which the subject's relationship with his desires (Özbek, 2018) are voiced and acted out in a collective plan, in a larger and greater picture.

From this consideration, the idea arose to measure in some way the sentiment of terrorists to better define the approach of anti-terrorism operators in prevention activities as in mitigation ones. Thus, by building communication bridges with the alterity (the terrorist), we can benefit from dialogue as the most effective intervention tool in prevention (Horgan, 2008; D'Amato, 2019).

Being able to assess the type and quality of communication with the Islamist alterity would allow targeted threat mitigation activities. Among these, the emergency negotiation, not always appropriate and sometimes prologue of ambushes. In fact, during the attack on the Bataclan the ISIS's commando asked for the negotiators but only to confront themselves militarily with a SWAT team within which these figures are usually inserted (Tirozzi, 2019). A useful confrontation for the armed propaganda which that terrorist action was representing: a clash with the best enemies to prove that one is the best of all.

## METHODOLOGY

The analysed information was taken from the arrest order issued by Italian judges following an investigation directly led by the present researcher who, at the time, was employed in the Special Operations Unit[3] of the Carabinieri Corps.

The information included numerous transcriptions of telephone interceptions between members of the terrorist cell investigated at the time. The judicial documents, after the trial, were fully unclassified and releasable to the public. As mentioned above, the investigation aimed at identifying and dismantling the last terrorist cell of Al Qaeda in Europe.

The judicial document acquired at the Court of Bari Registry was analyzed according to two different content analysis techniques. The first was a manual technique which implied the reading of the documents to produce valid and reliable inferences. This technique was preparatory for the IT type through Sentiment Analysis and described in detail below. In fact, the first content analysis technique allowed the contextualized interpretation of the reported facts through which to read the results acquired with the second technique.

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[2] "Jihad" is an Arabic verbal noun that descends from the three letters verb (we only consider the vowels) jaHaDa, which means striving. So, it can be translated literally as the "Effort". In the Islamic religion the concept expresses a dichotomy of meanings: a) the Great Jihad or the individual, personal effort of every Muslim to live, according with religion, every day better than the previous one, growing culturally and spiritually; b) The Little Jihad that is the duty of each Muslim to protect his land and his people from the invader, what we mistakenly call "holy war" and to which every day the Islamists have always appealed.

[3] Raggruppamento Operativo Speciale (ROS), is a department of the Carabinieri Corps with intelligence tasks, in the fight against terrorism and organized crime in Italy and abroad in relation to national interests.

We then concentrated on the transcripts of wiretappings used by the investigators to dispute the charges or build the sources of evidence. The texts have been divided into texts belonging to "old members" and texts belonging to "newcomers". We always, have reported all the conversations in which only the interlocutors directly involved in that criminal association were present. We have grouped in the ensemble of the "old members", those relating to conversations between subjects of long militancy in the organization (i.e. the specific cell but also belonging to other cells abroad), many of which were real radicalizers, while those among new adepts, the subjects under radicalization or neo-radicalized, were grouped in the set of "newcomers".

The transcripts examined in relation to the investigation consisted of 521 dialogues (of which 138 included in the set of the "old members" and 383 in that of the "newcomers"). The transcripts were originally translated from Arabic, the language used by the protagonists of those facts, to Italian by qualified interpreters appointed at the time by the operating Judicial Police.

The contents of the transcripts included in the two sets for the analysis were then purged of all the words devoid of proper semantic meaning (discourse markers, articles, conjunctions, etc.). Thus, leaving a remaining 78,994 words (with an average of 152 per dialogue) to analyse through the "R library", mentioned at pag.2. This software allowed for the sentiment semantically expressed in those dialogues to be established, thanks to an Italian dictionary specially implemented by the author of the software in which each word was given a value in terms of sentiment (positive, negative, neutral).

Parallel to the procedure described above, an emotional categorization of the selected conversations was carried out by applying a semantic approach that assigned each term to an explanatory category of sentiment (according to a ternary classification model, "positive, negative and neutral"). To do this, it was decided to use an application component (script Phyton), developed by Pegoraro and Isella (Bitcorp s.r.l. - www.bitcorp.it), which is able, first, to evaluate which algorithm of artificial intelligence (AI) was the most suitable to characterize the instrument through which to conduct the present study and subsequently to scan each word and bring it back to pre-established categories. The tool identified for this purpose was an AI's expert system[4]. Therefore, the application component set up had to initially select an artificial intelligence algorithm that would allow the learning process of the system (machine learning), to become, over time and with the exercise of its functions, an expert system. While at work, this system initialized the generation of a semantic filter that was automatically applied to all the thousands of words gathered, tracing them back to one of the pre-established subcategories, elaborated after the traditional content analysis, in which the departure classification model was drawn. That is, four categories for positive sentiments (quaternary sub-classification: "action, hope, compassion, friendship"), four categories for negative sentiments (quaternary sub-classification: "anger, refusal, abandonment, contempt") and one for neutral sentiments (single sub-classification: precisely the "other"

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[4] In artificial intelligence, an expert system is a computer system that emulates the decision-making ability of a human expert. Expert systems are designed to solve complex problems by reasoning through bodies of knowledge, represented mainly as if–then rules rather than through conventional procedural code.

sub-category, in the specific case all those terms not attributable to the other sub-categories).

The above mentioned nine categories, identified by the researcher after reading all the analysed conversations, were thus fed a second time to the system, through a second exercise done by exploiting in detail the model of supervised learning. The latter proved itself to be a more effective machine learning method, which could generate an expert system capable of using a discrete classification algorithm. In fact, after its first application on the single words, as described above, the system was put to work a second time on the same conversations. This time without eliminating the "service words" from the texts, working no longer on the value associated with individual words but on the most articulated structures at the level of entire sentences. Thus, managing to grasp the most probable context interactions allowed a more appropriate reclassification of the words with a greater "semantics" precision. Therefore, the expert system has distributed the analysed words within the eight semantic categories attributable to positive and negative sentiments, and the more "dubious" relations between lemmas and the phrase context, in the third grouping, the neutral one. It was the result of this last classification that was taken into consideration in the present study as summarized in Table No 1 on page 9.

## FRAMEWORK OF THE INVESTIGATION

The investigation allowed us to reconstruct, as stated in the documents analyzed by the judges, one of the ways in which Al Qaeda, between 2004 and 2009, promoted the radicalization of future combatants in Western Countries. The latter came into being due to the presence of particularly charismatic militants who managed to establish themselves as guides in the Islamic cultural centers scattered throughout the country. Once they had become a reference point for local immigrant communities, they carried out a careful observation of the visitors of those centers. After having identified the most suitable subjects to espouse their ideology, they invited them to attend private meetings away from indiscreet ears. The "recruiters" who acted at the time in Europe, after 9/11 and before the "Arab spring", became catalysts of disaffected young people, transforming their vague inspiration to jihad into a precise line of action. The network analysis (oriented to define the leadership of every European Al Qaeda's cell) revealed that these "recruiters" respond to a precise profile, as shown even in this specific judicial investigation. Often aged between 40 and 50, war veterans (Afghanistan and Bosnia), who had moved to the West in the `90s often obtaining political asylum to escape the repression carried out on Islamic movements in their countries of origin (Algeria, Egypt etc.).

Specifically, the recruiter arrested in the investigation in question had escaped the police and Carabinieri investigations that had dismantled the Al Qaeda cell in Milan between 2002 and 2004 and had allegedly moved to "clean himself up" in the Apulian town of Andria. Here he had married an Italian woman for the purpose of obtaining citizenship. In a few years he had managed to reconstruct locally, albeit in smaller proportions than those of the Milanese reality of the Islamic Cultural Center of *Viale*

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*Jenner*[5], a reality that re-proposed the Milanese one both in ideological terms and in clear *qaedist* affiliation.

At the time, the "old member" was aiming to recreate conditions that could no longer be restored due to the total annihilation of the *qaedist* structure, both in Europe and elsewhere. For this reason, the suspect was deprived of the references and the connections of the past. In those years, the modalities of radicalization were changing, with less and less clandestine didactic material and more and more use of the Internet and of websites and media channels set up *ad hoc* for radicalization and self-radicalization. We were in the phase of the *homegrown terrorism* and therefore the old model was becoming obsolete at the time, also because the tendency was increasingly that of consuming the attacks in the same countries where the martyrs had radicalized rather than preparing them and then making them leave for the theaters of Jihad. In those years, in fact, these departures were increasingly difficult and complex, except for the copious resumption with the Arab spring and with the opening of the Syrian front.

This specific investigation was focused on thirteen (13) suspects from a purely judicial point of view.

Among them, only one is considered, for the purposes of this research, an "old member", being a long-time militant of Al Qaeda and more specifically, already operating in the Milanese cell before 9/11. The Cell of Milan was a leading logistics cell directly involved in the plan that also included attacks on the World Trade Center and the Pentagon. The leadership of the "Milanese cell", of which the "old member" was part, was in direct contact with top management figures located between Belgium and Tunisia and with Osama Bin Laden.

The remaining twelve (12) suspects were considered, only for the purposes of research, as "newcomers" as recently radicalized or still undergoing radicalization. It should be noted that between the "old member", the radicalizer, and the "newcomers", the radicalized, there is perhaps a considerable generation gap; the first was in fact born in 1967 while his acolytes were, except for one who was born in 1964, all born between 1977 and 1989. It is also important to notice that only two of the 12 radicalized were without documents and present in Italy for less than 5 years while the others were all holders of a Residence Card, with a home and a job, and two Italian citizens born from multiracial couples, with one Italian parent and the other an immigrant (second generation and in both cases with a Tunisian ancestry).

## RESULTS

According to the amount of results collected by the investigators, the analysis of sentiment carried out on the two groups of the selected conversations, as described in the methodological paragraph, led to the detection of an overall positive feeling (on a total of 521 conversation, 208 are positive, 161 negative and 152 neutral). The volume of the conversations concerning the "old member" is decidedly lower than those of the "newcomers"; this is due to greater caution of the old terrorist while using the telephone, compared to that of the new inexpert militants. The presence of a very low number of

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[5] The Italian Al Qaeda's cell was strongly linked with the Islamic Cultural Center located in Milan, *Viale Jenner*.

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conversations with neutral sentiment in the old member's wiretappings indicates how the full-time commitment of long-term militants in the organization does not leave room for small talks nor for frequent contacts with subjects outside the organization. Thus, in the "old member", the values relating to the two opposite sentiments, negative and positive, are almost equivalent, with a slight preponderance of negative sentiment compared to positive.

It is striking how the conversations intercepted from the "newcomers" are much more numerous. This is due to their greater vulnerability to investigative tools and because they are more inclined to use the telephone, for two main reasons:

- they have recently left their past comfort zone for a new adventure; therefore, they are in a phase of transition between their previous existence as ordinary citizens and a new dimension as aspiring martyrs;

- they are younger and therefore more inclined to use smartphones, the Internet, social media and so forth.

The presence of a neutral sentiment in their conversations is very high. These are often conversations with family members, work colleagues or subjects who, in any case, are unrelated to their projects – conversations carried out hastily and for the most part with a lack of interest from the point of view of the investigators.

Instead, with regards to the proportion between the two opposite sentiments, negative and positive, the second is expressed almost twice in the conversations analyzed, confirming what had been said in general. This preponderance of a positive sentiment compared with the negative one is due to the greater enthusiasm of the young militant (not to be understood in terms of age but of militancy, even though the two often coincide) with respect to the pursued subversive project and to a blind faith in the organization that welcomes them.

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Figure 1 - Detected sentiments

**Old member's Sentiment** (138 conversations) NEG
　　　Positive Sentiment 59
　　　Negative Sentiment 67
　　　Neutral Sentiment 12

**Newcomers' Sentiment** (383 conversations) POS
　　　Positive Sentiment 149
　　　Negative Sentiment 94
　　　Neutral Sentiment 140
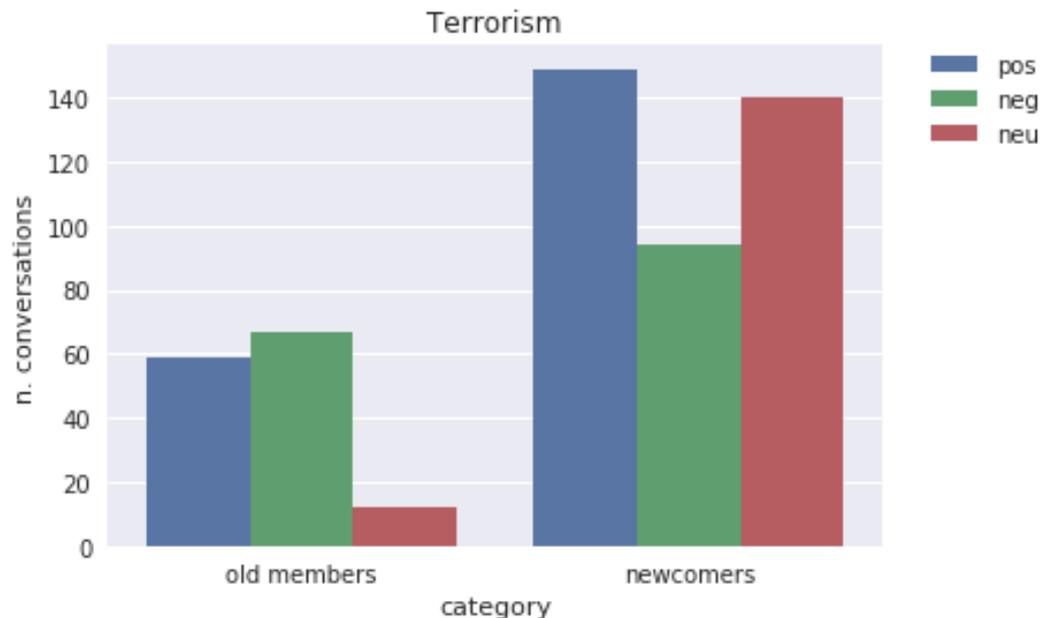


As it emerged by analyzing each conversation through R software and the related procedure, the sentiments detected from the telephone conversations intercepted in the context of the criminal proceedings, excluding a neutral sentiment, appeared to be positive (39.9% versus 30.9 negative).

Completely different is, instead, the sentiment detected through words' semantic analysis did as base of the emotional categorization of the data samples. In fact, in this case the sentiment appeared to be negative (23.9% versus 19.5 positive). This reversal, although with only 4.4% difference between negative and positive sentiment, because in many cases, conversations that expressed overall a negative sentiment was definitely denser of negative terms compared to those associated with positive sentiment.

Finally, the result obtained by associating terms with the emotional value attributed to sentiment indicated a preponderant tendency. With regards to positive sentiment, words were attributable to the concept of "hope", while for the negative one, words were attributable to the state of frustration and sentiment of "anger" that arise from the willful impulse that follows resentment and that often urges towards the desire for revenge, emotions evidently common both in those who flee from a life that does not gratify them and in those who decide to subvert an established order that does not satisfy them. The explained distribution of words correspondent to the their emotional categorization is represented in Figure 2.
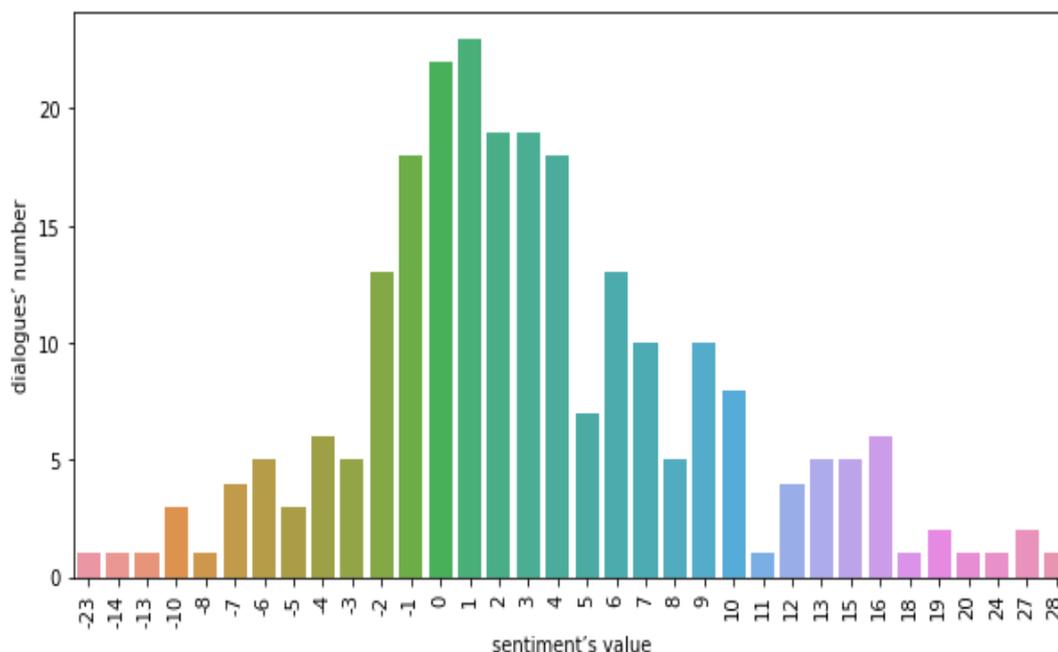
Figure 2 – Emotional Category of words
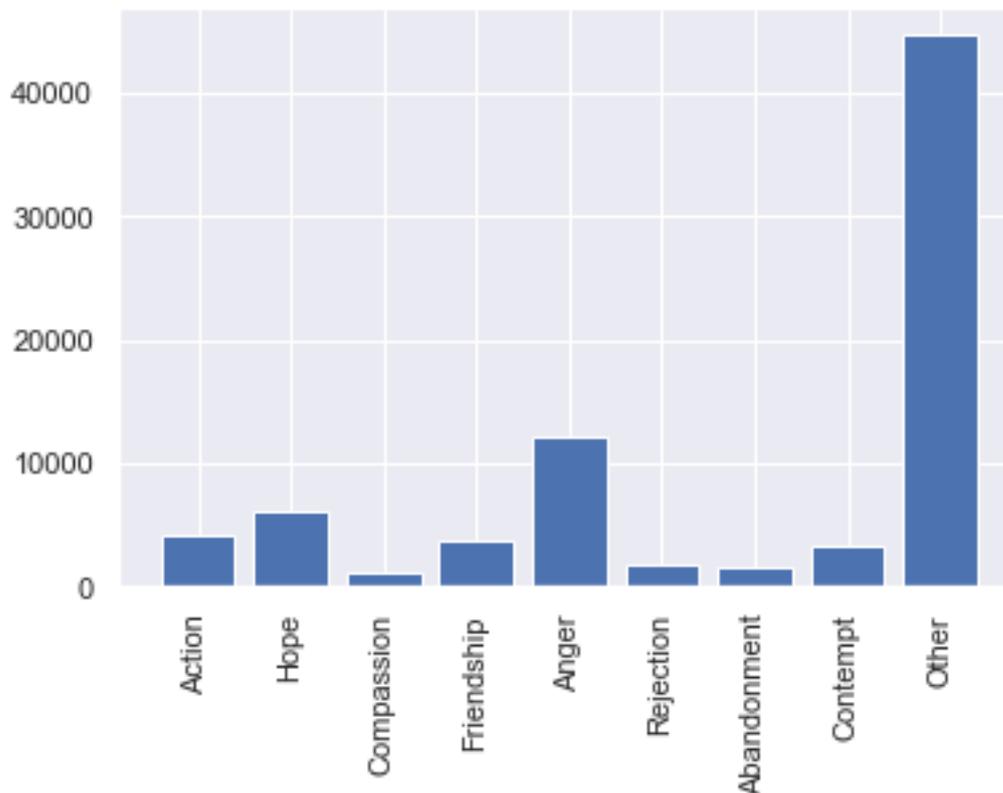


It should be noted that in the "Figure 3"[6] the dialogue sentiments are graphically represented by "bar charts". As we can see, at the center of the chart there are those whose neutrality is predominant, whereas on the right those dialogues whose sentiment is positive and vice versa on the left those that express a negative sentiment.

Figure 3 – Tendency representation of sentiment

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[6] In the figure the numerical value of the dialogue's sentiment is represented on the abscissa, with an integer that varies in an interval, from the dialogue with the highest sentiment in a negative sense to the one with the highest sentiment in a positive sense (and not as a ternary value -1/ 0 /+1 negative /neutral/ positive.) Therefore, to define the three negative / neutral / positive intervals in the least subjective way possible we started from 0 as an absolute neutral value and we used the standard deviation ($\sigma$) as a unit of measure to say when a value is far enough away from the average to be considered positive or negative, so we obtained bars that represent the number of dialogues, as indicated on the ordinate, with a certain intensity of sentiment, thus creating a Gaussian bell where the sentiment value that falls at least 1/2 a standard deviation from the mean we say is positive or negative. If it falls in the central band then it is neutral. So, from 0 to $-1/2\sigma$ and from 0 to $+ 1/2\sigma$ it represents the area of neutrality while $\leq 1/2\sigma$ the area of negativity and vice versa $\geq 1/2\sigma$ the area of positivity.

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Observing the representation of the sentiment tendency pointed out highlights the overall positive tendency expressed in the whole of the conversations analyzed. What is shown instead in Figure 1 suggests to us how this overall trend is strongly influenced by the greater number of recorded conversations that have seen the newcomers as protagonists.

Hence, a predominantly positive sentiment emerged from the conversations drawn from the "newcomers" as well as in all the conversations. In this regard, it is also evident that the emotional category called "action", among those associated with positive sentiments, occupies the fourth position in general percentage terms, equal to 5.3% of all words, after 7.8% of "Hope", 15.4% of "Anger" and 56.5% of the category " other ", that is associated with the "neutral" value of sentiment.

| Table 1 – Emotional categories | | | | |
|---|---|---|---|---|
| Rank by number of occurrences | Emotion semantically recalled | Nr. of words related to emotion | Percentage on the total of the analysed words | Associated sentiment |
| 1 | Other | 44,711 | 56.6% | Neutral |
| 2 | Anger | 12,165 | 15.4% | Negative |
| 3 | Hope | 6,162 | 7.8% | Positive |
| 4 | Action | 4,186 | 5.3% | Positive |
| 5 | Friendship | 3,870 | 4.9% | Positive |
| 6 | Contempt | 3,318 | 4.2% | Negative |
| 7 | Rejection | 1,896 | 2.4% | Negative |
| 8 | Abandonment | 1,501 | 1.9% | Negative |
| 9 | Compassion | 1,185 | 1.5% | Positive |

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## DISCUSSION AND CONCLUSION

From the present work results, it emerges, both by the conversations sentiment analysis and the sentiment analysis through the semantic analysis of every single words, a substantial balance between the feelings expressed, positive and negative. This therefore suggests that, despite the strongly antisocial choice, there is a great awareness and a true conviction in those who undertake this path. In other words, there seems to be no trace of an "anomic" or "normless" state which could led to an irrational fanaticism characterized by an obsessive imbalance towards a sentiment, whatever positive or negative. Rather there is the emotional and practical urge towards a new order, considered more just, supportive or simply better for their own needs. What is interesting are the differences in the feelings of the old member and the newcomers. In fact, we have seen how in the first one a negative sentiment is predominant, albeit slightly, while in the second a prevalent positive sentiment is registered.

This analysis is useful to highlight how there is an altruistic commitment which is, paradoxically as it seems, that made by a terrorist who, having overcome his rage by choosing to embrace political violence, embarks on a journey where hope (of victory, of a better future, of heaven) is a real and distinctive characteristic.

Reading the documents that describe the cell's members, it was evident that almost all those who were radicalized were already in a phase of advanced integration, if not cultural at least social, in Italy; almost all of them had a permanent job, almost all of them had been in Italy for over 10 years, two were even Italian citizens.

On the other hand, a negative sentiment of anger emerged from the conversations carried out by the "old member". These conversations are in fact steeped in political discourses that recall the clash, the war and the duty of annihilation of the enemy, from which a negative sentiment follows. At the same time, however, there are references to *Paradise*, *brotherhood*, *love* for one's own people that mitigate the negative sentiment with a positive sentiment that is, in the "old member", almost equivalent.

On the contrary, the "newcomers" expressed conversations characterized by a sentiment of hope, therefore positive, and prevalent compared to the decidedly residual anger. In this case, hope is preponderant, and a strong positive sentiment characterizes both sets of conversations here ("old member" and "newcomers", even if in the former a negative sentiment is slightly predominant), there is also great enthusiasm and hope for the action, longed for by most. Hence, copious semantics referring to the concept / category "Action" are grouped into the ensemble of positive sentiments together with that of "Hope". In short, the aspiring shahids, as well as the old militant, are decidedly passionate in what they do, as if is expected in the case of every strong decision in human existence, and therefore they are full of hope for the future that they wish to change.

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For this reason, it seems possible in certain circumstances to conceive a negotiation activity with jihadist terrorists. In fact, with regards to certain types of negotiations, of a relational type, such as that underlying undercover operations, a profitable communication appears possible. In this case, the examination of a greater amount of data could effectively lead to the development of new communication strategies and new hi-tech tools in the fight against terrorism.

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