Original Article

Biofield Frequency Bands—Definitions and Group Differences

Global Advances in Health and Medicine
Volume 9: 1–10

DOI: 10.1177/2164956120982568
journals.sagepub.com/home/gam
SAGE

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Abstract

Background: In the biofield literature, it is suggested that electromagnetic energy is part of the biofield. However, little is known about the exact definition of potential electromagnetic biofield frequency bands (FBs).
Primary Study Objective: The current study sought to identify biofield FBs and test potential group differences.
Methods/Design: High-frequency (i.e. >200 Hertz) voltage was measured at body parts along the spine and the brain.
Setting: Measurements were conducted in an electrically shielded laboratory.
Participants: Twenty experienced biofield practitioners (BPs, sample 1) and twenty-four students (STs, sample 2) participated in the study.
Interventions: The BPs performed a wide set of biofield exercises, while the STs participated in an assessment centre (with exercises such as role play). A total of $N = 342$ exercises were performed.
Primary Outcome Measures: Based on surface electromyography, high-frequency (i.e., >200 Hertz) voltage was utilized as outcome measure.
Results: 10 FBs were identified across all the data sets. The BPs had higher spectral power across these bands compared to the STs.
Conclusion: The present paper presents a replicable method for the assessment of electromagnetic FBs which are potentially useful for future biofield research.

Keywords

biofield, complementary and alternative medicine, electromyography

Received May 12, 2020; Revised December 2, 2020. Accepted for publication 00, 0000

"*God is in the spine*."

Paramahansa Yogananda

Introduction

While the current neuroscientific paradigm focuses on the brain as the primary source of cognitive experiences, the statement above, a quote from an important yoga leader in the west, emphasizes the potential importance of body parts other than the brain in helping our understanding of spiritual (and other psychological or cognitive) subjective experiences.

The importance of the whole body and its biofield for our subjective experiences and well-being is emphasized in many cultures.[1,2] For example, it is hypothesized in the Hindu and yoga literature that 'energy centers' (Sanskrit *chakras*) along the spine (a) form the basis of the electromagnetic aspects of the biofield, and (b) process energy which is responsible for physical, emotional, mental and spiritual experiences.[3,4]

However, to date, no research has provided a peer-reviewed and replicable method of assessing the electromagnetic frequency bands (FB) which can be conceptualized as a biofield marker.[5,6] Thus, given the

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premise that subjective experiences are processed both in the brain and 'in the spine', the purpose of the present study is to explore such a measurement approach and to test whether group-specific differences exist within these FBs.

Definition of the Biofield

The biofield has been defined as a "... complex organizing energy field engaged in the generation, maintenance, and regulation of biological homeodynamics,"[1(p8)] and "... living systems coexist within and co-contribute to a biofield, which we define in terms of electric, magnetic, and electromagnetic fields ...."[7(p1081)] Thus, neuroscientific studies which include electroencephalographic (EEG) measurements of brain activity, can be seen as only one aspect of biofield research.[5,8] Other aspects include the electromyographic (EMG) measurement of muscle activity. For example, it has been demonstrated in a case study that a biofield practitioner (BP) was able to alter a client's EMG significantly.[8] The key point here is that while current neuroscientific research tends to separate various aspects of the biofield (EEG, EMG, and others) in order to study them in isolation, the biofield, per definition, neither distinguishes between these aspects nor does it focus exclusively on certain body parts, such as the brain.[2,5]

This makes sense, since from an evolutionary perspective all living beings, even monocytes, have an electromagnetic field surrounding their body.[9] Moreover, it has already been demonstrated that monocytes communicate with their biofield.[10] In line with Yogananda's quote above, this demonstrates that the biofield surrounds the whole body (including the spine), and not just the brain. Therefore, it should be studied using (multiple) measurement locations both inside and outside the brain area. This idea is in line with earlier research conducted by Becker,[11] whose findings supported the notion that a biologically relevant electromagnet field exists around all living beings.

It has long been known that the brain sends signals (e.g. between 20 and 100 Hz) to muscles, and that simultaneous measurements of the brain and muscles show coherent energy patterns,[12] suggesting that there is one connected (bio-)field, rather than only local mechanisms. In general, current neuroscience does not deny the importance of neurological processes outside the brain. For example, several ganglions located along the spine have been known to emit biologically and psychologically relevant electromagnetic energy in frequencies not just within, but also above, the 0-200Hz range which is typically studied.[13,14] However, what the empirical neuroscientific literature lacks, is an integrative study which considers more than two measurement locations simultaneously. Such a study would be in line with the biofield definitions quoted above.

Potential Assessment of the Biofield

The present study focuses on body parts that are all related to nerve centers, such as ganglions, along the spine. Both electromagnetic nerve impulses and biochemical processes charged with their respective electromagnetic signatures (e.g. hormones such as oxytocin, cf. Moreno-López et al.[15]) are important and, potentially, could form the basis of what is measured as an overall output of electromagnetic energy in these nerve centers.[7] Thus, they can be conceptualized as *energy centers*. It should be noted that these energy centers are not small dots like, for example, acupuncture points, but body areas because (a) the underlying tissue, such as ganglions, have a considerable size (e.g. several centimeters^3) and (b) by definition, the electromagnetic energy radiated by this tissue cannot be only local.[4] This has been empirically supported by research focusing on (electro) magnet fields around the heart, in which it was demonstrated that the field emitted by the heart muscles could be measured several feet away from the body.[16] A recent empirical study confirmed that BPs were able to assess intra- and inter-individual differences between energy centers along the spine.[17]

Frequency-Band Specific Biofield Research

Another limitation, in addition to the current neuroscientific focus on the brain, is the predominant focus on a limited set of frequencies when measuring cognitive (and motor) processes. In neuroscientific electroencephalographic (EEG) studies, frequencies below 100 Hertz (Hz) are typically utilized in brain research, while frequencies below 200 Hz are utilized in electromyography (EMG) research. These FB limitations can also be found in biofield research: For example, in a case ($N = 1$) study,[8] EMG frequencies up to 65 Hertz (Hz) were measured at various acupuncture points. It was found that the EMG amplitude was higher when a BP gave the subject a biofield treatment, compared to baseline levels.

While these first biofield research studies provide some insight into biofield assessment, frequencies above 200 Hz are potentially relevant for our understanding of cognitive (and other) processes.[18,19] For example, an empirical study revealed that neuron stimulation at 500 Hz inhibited the information processing in the cat hypothalamus.[20] With regard to biofield research, it was found in the Hunt et al. case ($N = 4$) study,[21] that the high-frequency (i.e., above 200 Hz) EMG which was emitted from areas located on the spine, as well as from the brain, was related to the BPs' description of the biofield. Several FBs were

identified and labeled in accordance with the BP's description of their subjective visual perceptions. For example, EMG frequencies around 300 Hz were described as having a "green color". It was claimed that this and, in turn other, *colors* were related to subjective physical, emotional, mental and spiritual experiences.

While this initial case study claimed to provide a detailed description of the biofield's EMG-based characteristics in the range above 200 Hz, it had considerable limitations. First, only four subjects were analyzed. While the biofield literature describes seven body parts which are important for the biofield (cf. Method section and Table 1 below), for each subject, only one to four body parts were utilized for EMG measurement. Thus, it was not possible to compare the subjects with each other. Next, it was unclear which body part had been used to conduct the EMG measurement for each subject. Third, the description of the assessment methods, as well as the subsequent statistical analyses, was at best, vague. Together, these limitations prevented replication of the study's results.[21,22]

Research Goals

It is possible to conclude from the review of the biofield literature provided above, that high-frequency EMG could be conceptualized as a potential biomarker for the biofield.[23] However, the few empirical studies that exist to date have considerable limitations. The present study aims to close this gap in the biofield literature, by pursuing the primary goal of testing whether FBs above 200 Hz which are common to all body parts can be identified empirically.

It is suggested in the biofield scientific[24–27] and practitioners'[28,29] literature that various exercises (such as yoga and praying) are conducted in order to change, or strengthen, the biofield. Thus, for the purpose of the present study, a sample of biofield practitioners (BPs) performed a wide range of biofield practices so that potential biofield FBs could be detected from the resulting EMG data. Thus, in this study, the main idea behind biofield assessment is that if the biofield is relevant to human (e.g., cognitive and spiritual) experiences, a diverse set of biofield practices performed by different practitioners, should yield common response types, in the form of FBs.

If the biofield mirrors human experiences which are common to all humans, not only BPs, then other samples are important for the detection of potential biofield markers, such as FBs. For example, students (ST) must apply for jobs and therefore encounter situations such as job interviews. Thus, a second, independent sample (i.e. students) was acquired. Both samples, the BPs and the STs, were utilized to pursue the first research goal of identifying potential biofield FBs.

In the context of the second research goal, if biofield FBs exist, there should be meaningful differences between the groups. For example, BPs regularly perform exercises specifically to strengthening their biofields, so that they can use it for healing purposes.[19,26,30] Therefore, BPs should have stronger (i.e. higher spectral power) biofields than STs at baseline levels. The second research goal was to test this assumption.

Methods

Participants

Sample 1. BPs were acquired through the Crucible Program (see www.rosalynlbruyere.org), a long-term biofield training which has been previously scrutinized in peer-reviewed studies.[17,26] A total of twenty healthy

Table 1. Measurement Specifications.

Amplifier Channel	Electrode Placement	Body Part	Examples of Relationship to Nervous System
#1	Upper edge of pubic bone, right of the central line	#1	Coccygeal plexus
#2	bipolar to #1, left of the central line		
#3	Next to navel, right of the central line	#2	Sacral plexus
#4	bipolar to #3, left of the central line		
#5	Lower edge of sternum, right of the central line	#3	Solar Plexus
#6	bipolar to #5, left of the central line		
#7	5th Rip, right of the central line	#4	Cardiac plexus
#8	bipolar to #7, left of the central line		
#9	Larynx, right of the central line	#5	Superior, middle, and interior cervical ganglia
#10	bipolar to #9, left of the central line		
#11	Forehead, right of the central line, FP1[a]	#6	Center of forehead (brain/cortex)
#12	bipolar to #11, left of the central line, FP2[a]		
#13	Top of the head, right of the central line, C1[a]	#7	Top of head (brain/cortex)
#14	bipolar to #13, left of the central line, C2[a]		

[a]EEG locations (international 10/10 system).[56]

BPs volunteered to take part in the present study. The average age was 57.10 years ($SD = 7.45$), of which 15% were males, and all were Caucasian. Their education ranged from junior high school (15%), secondary school (35%), up to university degree (50%).

The BPs had, on average, 13.69 years ($SD = 9$) of formal training in biofield techniques and had worked for 13.81 years ($SD = 9.13$) as BPs (i.e. as medical doctors (15%), healing practitioners (25%), massage therapists (5%), hands-on healers (20%), and others (35%)), and had, on average, 5.49 ($SD = 7.22$) clients per week.

Sample 2. Students (ST) from a German University were acquired by the first author's research assistants. The STs had a secondary school (100%) qualification, and were in their fifth or sixth semester of management studies. A total of 45 healthy STs volunteered to participate in the present study. The average age was 22.50 years ($SD = 2.06$), of which 44% were males, and all were Caucasian.

Procedures

After receiving information about the studý s goals and having provided written informed consent, each participant was prepared for the biofield measurement, as described below.

Procedure for BPs. Each BP provided a baseline-measurement, followed by a self-chosen set of biofield exercises. The only requirement was that these were exercises that the respective BP performed regularly to strengthen their biofield. Since, to the best of the authors' knowledge, no survey providing an overview or categorization of biofield exercises exists, the authors wanted to allow the BPs to choose which exercises were most effective for their own biofields. This is in line with a recent paper[23] which emphasizes the importance of an expert-centered view, i.e. the BPs were viewed as experts for their own biofields (energy).

Each participant performed between 4 and 11 exercises ($M = 7.2$). In total, the BPs performed $N_{BP} = 139$ exercises (more information on these exercises can be found in Supplement S1). Thus, it can be concluded that they performed a considerable variety of exercises that, at least from their own subjective experience, had an impact on their biofields.

Examples of the exercises included physical exercises, such as push-ups or yoga, spiritual exercises, such as prayer, eliciting positive emotions, such as compassion, and mental efforts, such as reading job-related publications. These categories of exercises have repeatedly been reported on in the biofield literature[1,17,23] and were therefore suitable for the purposes of the present study.

Procedure for Students. Like the BPs, each student (ST) provided a baseline-measurement and then performed a set of exercises. In contrast to the BPs, the set of exercises was pre-determined because the overall setting was a simulated assessment center (which was part of an extra-curricular university course) that aimed to provide the ST with a realistic outlook regarding potential future personnel selection experiences. Since STs need to apply for internships or jobs, the assessment center represents a setting typical of a ST's life, and thus, was suitable for the present study.

Three exercises were performed in this assessment center: First, the Trierer Social Stress Test,[31,32] a standardized procedure, which focused on a self-presentation. Second, a mindfulness exercise which required the ST to focus on subjective perceptions, such as posture and breathing.[33] Thirdly, twenty-four students were assigned the role of 'manager' and twenty that of 'subordinate' in a one-on-one role play (see Supplementary Table S1), aiming to simulate a typical, job-related task (i.e., goal-setting), as it is commonly done in management training.[34] Exercises such as self-presentation and role play are routinely included in assessment centers.[35] The mindfulness exercise was included since it allowed the ST to regain their (e.g. mental and physical) resources after the self-presentation. Problems with the data assessment occurred during several of the measurements (e.g. broken cable, excessive sweating due to heat). These measurements were not included in the final data set, which contained $N_{ST} = 203$ data sets.

Data Acquisition

The respective measurement was taken between two exercises, with the aim of assessing the previous exercise's effect on the biofield. The participant sat comfortably on a chair during the measurement and was instructed not to move.

EMG was recorded at the body parts described in the biofield literature.[3,17] In line with prior studies,[21,24] two electrodes per respective body part were placed 2.5 cm from the frontal line. Table 1 summarizes the electrode locations and their relationships to the nervous system.

In line with the EMG methodological literature, bipolar electrodes (11 mm/2 mm Ag/AgCl electrodes, prefilled with soft gel) were utilized,[14] in accordance with the recommended guidelines.[36,37] An electrode cap with 13 mm/4 mm Ag/AgCl electrodes was used for the two brain areas.

In addition to the seven bipolar electrode pairs, a ground electrode was placed on the wrist for the following reasons. First, the grounding electrode is supposed to be placed on an inactive site,[37,38] and since the present study is aimed at measuring biofield 'energy', the wrist is

a distal position. Second, placing the grounding electrode on the wrist is in line with the previous biofield studies.[21] Furthermore, and in line with the methodological neurophysiological literature,[37,38] a reference electrode was placed on the earlobe.

A g.GammaBox from g.tec (Guger Technologies, Austria; see www.gtec.at) was utilized as a pre-amplifier to ensure a high common-mode rejection ratio and a gUSBamp amplifier (Guger Technologies, Austria) was used to amplify the pre-amplified signal (38.4 kHz internal sampling).

All devices were battery driven, in order to minimize power line artifacts. The laboratory was electromagnetically shielded. The respective body parts' skin was abraded and cleaned with alcohol before the measurements. The impedance was kept below 30 KOhm ($M = 1.53$, $SD = 1.82$),[36,39] and the sampling rate was 4800 Hz. The raw data were processed off-line with the help of MATLAB (V. 2016a). Each measurement included 5 minutes of unfiltered data.

Removal of Artifacts

The total data set contained the measurements from the BPs ($N_{BP} = 139$) and the STs ($N_{ST} = 203$) sample (total $N = 342$). The data sets were first detrended and the baseline was removed, then the data were checked for potential movement artifacts. Thus, based on their respective kurtosis, probability and power spectrum, bad channels were rejected, and, subsequently, interpolated.[39,40] Since EEGLAB is not designed for electrode positions along the spine, the positions were approximated by positions near Cz. Thereafter, EEGLAB's[41] cleanline tool[39,42] was used to purge the data sets from potential instrumental or line noise.

Each data set was epoched (2 seconds) to check for problematic time segments and, thereafter, EEGLAB'S automatic (a) spectrum rejection, and (b) artifact epoch detection and rejection algorithms were both performed, thus rejecting improbable epochs. Finally, the data sets were re-referenced.

Power Spectra

The goal of the first step of the analysis was to analyze the power spectrum separately for each body part. More specifically, for each body part and exercise separately, the power spectral density (PSD) was calculated using Welch's[43] algorithm. A Hamming window[44–46] was utilized, together with a 50% overlap. Thereafter, each PSD was smoothed (using a Savitzky-Golay filter) and normalized.

Results

Identification of FBs

In line with the present study's primary research goal, the second step in the analysis was to identify potential biofield FBs. Since each of the seven body parts can be seen as biofield measurement points, the goal of the FB identification was to focus on the part of the biofield that was consistent across the body parts and exercises, and to ignore any information in the PSD that was either very weak or noisy, or specific to one body part. Neuroscientific research often looks for local PSD peaks in order to identify FBs. For example, alpha brain waves can be recognized by a local spectral peak between 8 and 12 Hertz.

One way of identifying FBs in PSDs across multiple measurement locations is to use parallel factor analysis (parafac, cf. Tomasi and Bro[47] and Andersson and Bro[48]). For example, it was used in EEG research to detect spectral bands (e.g. EEG alpha rhythm) in a 3-dimensional (i.e. EEG-Channels x Time x Frequency) data-matrix.[49] Parafac makes no assumptions on the factor solutions known from classical factor analyses, such as orthogonality of factors, etc. Therefore, it is suitable for detecting unique spectra in three-way data. For the purpose of our study, parafac was used to detect peaks within spectra (i.e. frequency domain), across body parts and exercises; a 3-dimensional (i.e. body parts x exercises x frequencies) data-matrix was used as an input to the present parafac analysis.

Parafac was performed with MATLAB's N-way toolbox,[48] resulting in two factors which accounted for 81.39% of the variance in the data. For parafac, the model's fit is regularly evaluated by checking the core consistency, which should ideally be 100% to indicate a valid model.[47] In the present analysis, the core consistency was 100%, indicating a valid model. Figure 1 shows the parafac result in the frequency domain (results for the exercise and body locations domains, respectively, can be found in Supplement S2).

The overall shape of the first factor (see Figure 1, blue line) followed the 1/f 'power law', which is typical for neuroscientific data.[50] This 1/f-trend in PSDs is typically ignored in the EEG literature, since biologically relevant information is usually contained in deviations from the 1/f-trend.[51]

The second factor (see Figure 1, red line) revealed several clearly identifiable peaks. Following the methodological literature,[52] we calculated the 95% confidence interval based on 1000 bootstrap samples, each with 50% of the original sample size (i.e. $N = 171$) (with no replacement). Clearly, the various peaks in the second factor stand out significantly.

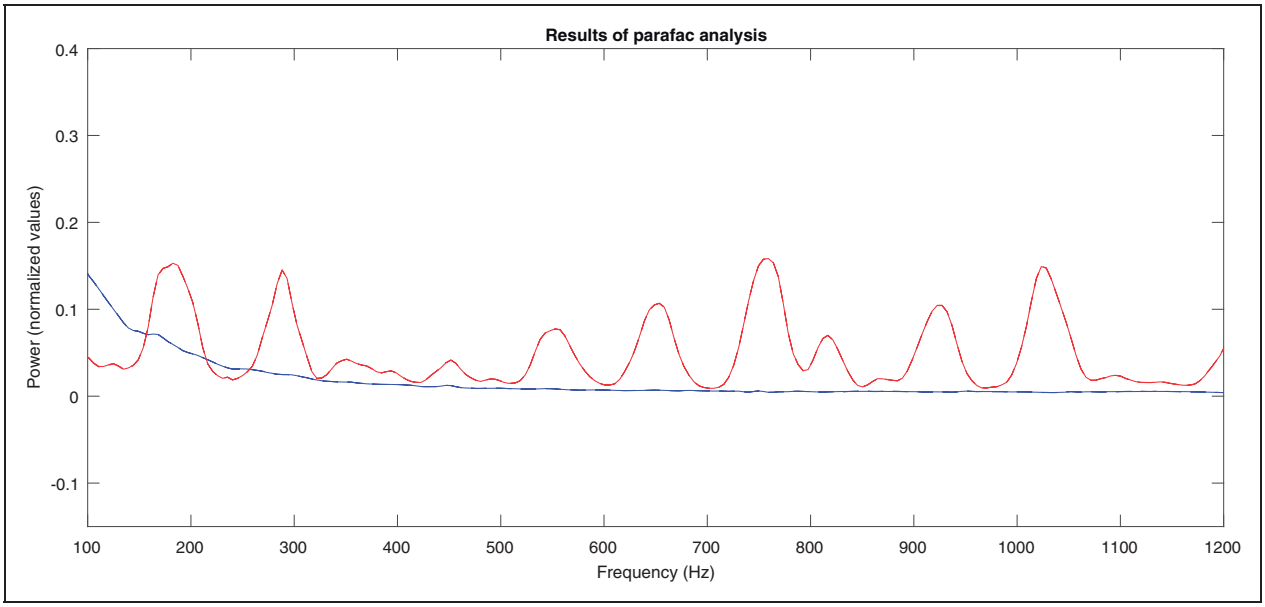

Figure 1. Results of Parafac Analysis. Note. Results from parafac analyses in the frequency domain: The first factor (blue line) represents a 1/f-factor, while the second factor (red line) contains potential biofield information. Due to the large sample size, the 95% confidence intervals (from 1000 bootstrap samples with 50% sample size of the total sample) are very tight around the mean.

For the exact definition of FBs, we followed prior biofield research,[21,22] which suggested that the relevant biofield information could be found between ~180 and ~1100 Hz: Ten peaks were identified within this range of frequencies with the help of MATLAB's peakfinder.[53] As visualized in Figure 2, a FB was defined around each of these peaks by the respective local minima below and above the respective peak. Thus, with regard to the first research goal, it could be confirmed that biofield FBs could be identified across body locations and exercises. Table 2 summarizes the key characteristics of these FBs.

As can be seen from Table 2, in general, these FBs are in accordance with earlier case studies.[21,22] To enable a more detailed comparison, the 10 FBs were interpreted and labeled as *biofield colors* in the following way: In the studies conducted by Hunt et al.,[21,22] the FBs were assigned *colors,* since these colors had been perceived by independent BPs who had observed the participants being measured. For example, it was found that power around 200 Hz was associated with a dark blue color. Thus, when the first FB to be revealed by the parafac analysis in the present study was between 135 and 240 Hertz, it was labeled as dark blue. The same was true for the remaining FBs, with two exceptions: Whereas the prior research claimed to have identified one green FB, the present study revealed two FBs. The same was true for red FBs. For purposes of comprehensibility, the color spectrum identified in prior research has been included at the bottom of Figure 2. It should be noted that the prior research conducted by Hunt et al.[21,22] was not unequivocal regarding the exact definition of FBs. Thus, the assignment of specific biofield colors to the FBs found in the present study should only be seen as preliminary.

Testing Differences Between BPs and STs

As was described in the Method section, the respective baseline measurements were the only measurements that were mandatory for both samples, the BPs and the STs. Thus, in order to test group differences (i.e. BPs versus STs), we focused on the BPs' baseline measurements ($N = 20$) and those of the students ($N = 24$), respectively.

In order to remove the 1/f trend in the data, the PSDs were standardized across frequency bins. Thereafter, 95% CIs were calculated around the mean of each group. Figure 3 shows the results.

As can be seen, the BPs had significantly higher power values for most parts of all the FBs. On the other hand, STs revealed higher power values than the BPs for certain frequencies within the *red(1)*, *red(2)*, *purple*, and *white* FBs, respectively.

With regard to the second research goal, a *t*-test was performed to determine which group had higher power values across frequencies. The results demonstrated that the BPs ($M = 0.09$, $SD = 0.15$) had significantly ($p < \text{e-}18$) higher (biofield) power than the students ($M = -0.07$, $SD = 0.12$).

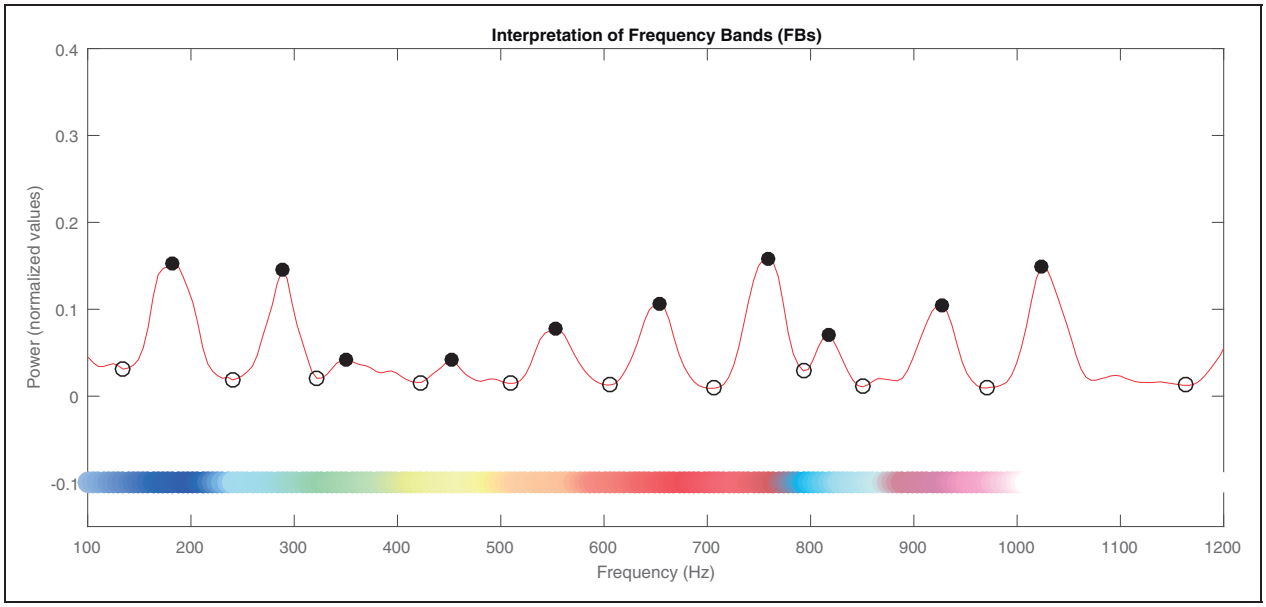

Figure 2. Interpretation of Frequency Bands (FBs). Note. Interpretation of the second factor (red line, cf. Figure 1) of parafac analysis (based on the total sample). Ten distinct peaks with their respective maxima (filled) and minima (circled) were detected. Exact values for the frequencies can be found in Table 2, respectively. For interpretation of the labeling of the newly identified FBs, the color spectrum at the bottom follows the suggestions from earlier research.[21,22]

Table 2. Definition of Biofield Frequency Bands (in Hz).

		Present Study		
Label	Prior Research[a]	$F_{lower\ bound}$	$F_{central}$	$F_{upper\ bound}$
#1 Dark Blue	200–240	135	183	240
#2 Green(1)	240–400	240	288	322
#3 Green(2)	240–400	322	351	423
#4 Yellow	400–500	423	452	509
#5 Orange	500–640	509	553	605
#6 Red(1)	640–800	605	654	706
#7 Red(2)	640–800	706	759	793
#8 Bright Blue	~800	793	817	851
#9 Purple	~900	851	927	971
#10 White	>1000	971	1023	1163

[a]The bounds of the various frequency bands were derived from prior biofield research.[21,22]

Discussion

The present study is the first systematic, neuroscientific research effort to demonstrate that ten FBs above 200 Hz can be distinguished across participants and body parts. This supports the western/modern theoretical notions[5,7] that the human system includes a complex, electromagnetic (bio-)field. While prior research agreed that brainwaves consistently include alpha, beta, etc. FBs, as a part of the biofield[7], the present study is the first to demonstrate that ten FBs above 200 Hz can be consistently found across participants and body parts. This also supports the eastern/ancient notions[3] that seven body parts (energy centers or chakras) cooperateto produce one single, multifaceted biofield. The results of the present study go beyond Hunt et al.[21,22] findings: First, the combination of twenty BPs and forty-four STs provided more than 340 data sets and a huge variety of exercises were performed. The large data set enabled advanced statistical modeling (i.e. parafac) and yielded results with small confidence intervals (see Figure 1). Although neither sample was representative for the general population, well-defined FBs emerged.

Furthermore, the method described here is based on a standardized, simultaneous measurement of seven body

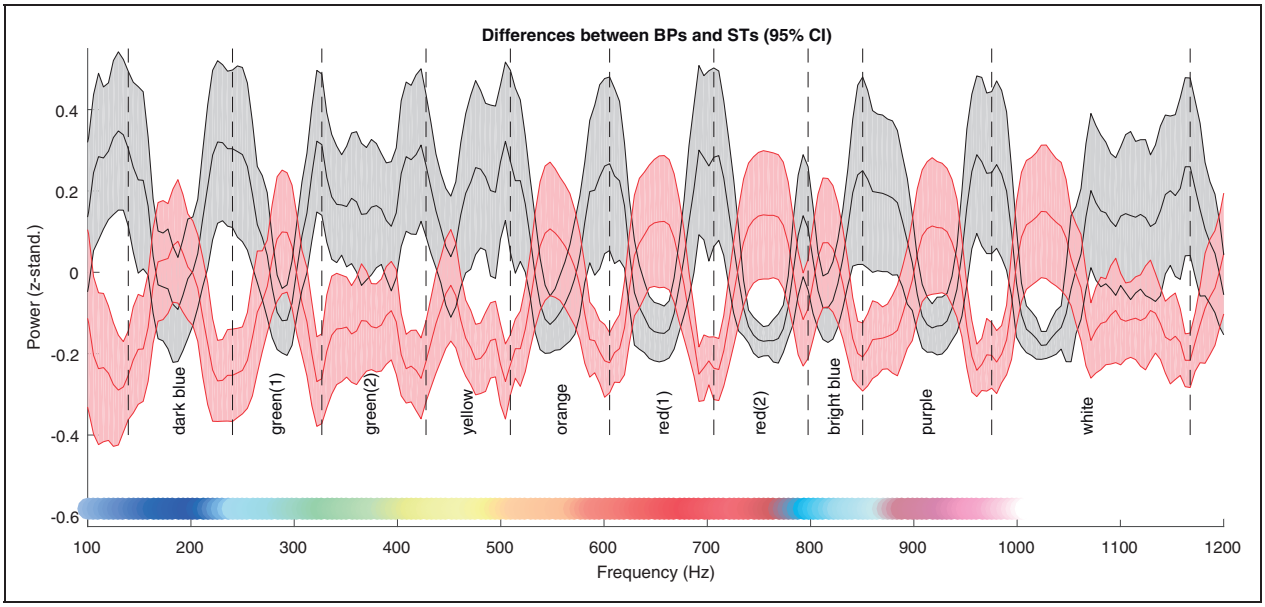

Figure 3. Group Differences (BPs Versus STs). Note. Baseline means and 95%CI for BPs (black) and STs (red).

parts. This biofield assessment approach is also (a) congruent with current neuroscience and (b) described in detail (see *Method* section). Thus, for the first time, it is possible for other researchers to replicate the present results.

This study demonstrates that BPs have higher biofield power compared to STs. This supports the biofield's construct validity: BPs who claim to have enough biofield energy to utilize it for healing purposes, should have higher baseline biofield power levels than people who do not focus on their biofields (such as students).

Limitations and Implications for Future Research

If BPs have more biofield power compared to STs, how are the identified FBs related to physical and emotional health? Which health-relevant physiological (such as hormones) and psychological (such as emotions) factors are related to the various FBs? Future research should address these important basic questions.

While collecting a set of self-chosen exercises from the BPs was an advantage because it yielded rich and diverse PSDs, it might be considered a disadvantage when it comes to testing exercise-specific effects: There were simply too few exercises per category. Therefore, future studies should examine the effect of one specific, previously selected exercise (such as Chi Gong) on the biofield colors, in a randomized, controlled trial.[54]

In contrast to previous research, the present study identified two green and red FBs. Future research including additional samples is needed to validate the FBs identified in this study. Stated differently, as each of the two samples performed exercises typical of their respective everyday lives, the FBs detected at least have internal validity for these two groups. Nevertheless, future research should include other groups, such as children. Ultimately, testing representative samples from various groups – as well as the general population - will yield higher levels of external validity for the reported FBs.

While the electromagnetic aspects form one part of the biofield, other indicators such as biophotons[5,55] are also important. Thus, future research should include both EMG and biophoton measurements, allowing a clearer understanding of the potential overlap between these two biofield indicators to emerge, and ultimately, making a clearer biofield construct definition possible.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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Supplemental Material

Supplemental material for this article is available online.

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