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Pranayama and Prosody: Unilateral Nostril Breathing to Enhance

Recognition of Emotional Tone

Natalie Stratton

The Richard Stockton College of New Jersey

and mind, Breathing patterns are a mirror of our mental and physical conditions. For instance, if one is rushed or stressed in their thinking or activities, the breathing pattern is often shallow and the same pattern. On the other hand, when one is calm, the breathing process is smoother,

studied right before their (B minute *arti i*ation and &ithin !i+e minutes a!ter, 5 heart rate, systoli and diastoli)lood *ressures, *ea\$ e4*iratory !lo& rate .s*eed o! e4hale/, sim*le *ro)lem sol+ing a)ility, and mental e!!i ien y &ere all e4amined,

"he)aseline readings o! all three grou*s &ere similar, 5o&e+er, a!ter the (B minute regimens, signi!i ant de lines in heart rate and systoli)lood *ressure, signi!i ant im*ro+ements in *ea\$ e4*iratory !lo& rates, and redu tion in the time ta\$en to solve mathemati al e-uations, &as only seen in the e4*erimental grou*, No signi!i ant di!!eren es in ontrol A or B &ere re*orted, "his sho&ed that normal rela4ation and/or !o us on)reathing alone ould not om*are to ANB in results, "he authors mention)alan ing o! the)rain>s hemis*heres as a *ossi)le me hanism,

"he authors cite in reases in al*ha &a+e a ti+ity, noted in other resear h on yogis, as a *ossi)le orrelate to the results o! their o&n study, Al*ha &a+es are seen during an alert)ut dee*ly rela4ed state, as o)ser+ed in ele troen e*halogram>s .EED/, "hey state that the o)ser+ed redu tion in heart rate, *artnered &ith in reases in utaneous *eri*heral +as ular resistan e .redu tion in)lood !lo& to the sur!a e o! the s\$in/ noted in yogis a!ter meditation, also indi ate *hysiologi al rela4ation along &ith their heightened mental alertness, "hus, *ranayama, s*e i!i ally ANB, seems to im*ro+e)oth mental and *hysi al health and !un tioning, "he ne4t study is an e4 ellent e4am*le o! this,

#amei and olleagues .(BB1/, loo\$ed at orrelations)et&een *ranayama indu ed al*ha rhythms, and natural \$iller ell .N#%/ a ti+ity in the)ody, A N#% signals the immune system to !un tion, *laying a ma;or role in !ighting o!! +iruses and tumors, 6n this study, eight +eteran yoga instru tors .< men and < &omen/ *arti i*ated, During testing,)rain rhythms &ere ontinuously re orded +ia ele trodes *la ed on the su);e ts>

any given time, depending on which nostril is dominant, the opposite hemisphere of the brain has been observed to show more activity. Sauer, (1984), Yogis have claimed that unilateral nostril breathing can be used to alter certain cognitive tasks. Dilbert, (1997), ideally, one might coordinate one's activities with the cognitive functions linked to the hemisphere of the brain that is presently dominant,

though the body does naturally switch to its dominant hemisphere throughout the day, yogis believe that the alternating rhythm is often disturbed, so performing ANB could help assist in balancing the two hemispheres once again, if one desired to manually switch the dominant hemisphere, in order to be better equipped for a specific task, Unilateral Nostril Breathing (UNB), also described by Dilbert (1997), could do the trick, Dilbert (1997) explains that the cool air being inhaled through the dominant nostril can apparently suppress the dominant side of the hemisphere directly above it, allowing the opposite hemisphere to then dominate, however, not all studies have shown this,

Stanford and Shuna (1997) studied the EED readings of 10 trained subjects when practicing in UNB, they called this technique "Alternate Nostril Breathing (ANB)", however the description of what was recorded showed that they were actually studying UNB, and of the subjects recorded consistent left nostril inhalation and right nostril exhalation, while the other half recorded right nostril inhalation and left nostril exhalation, Both of these were recorded for two rounds of 15 minutes each, These entire

of the study, All participants engaged in (minutes of UNB prior to any testing to ensure that a minimum baseline was met, In this study, the traditional yogi protocol for UNB was not used, Rather, one nostril was allowed completely for all inhalation and exhalation to occur through the opened nostril,

Four rhyming words were spoken in four emotional tones, "these were joy, anger, sorrow, and neutrality in the four emotions of angry, happy, sad, and neutral, For the emotional targets portion of the testing, subjects were instructed to breathe yes when they heard an angry voice, and no when they did not, when listening for words, they were to breathe yes when they heard the voice speak the word joy, and no when they did not, there were 12 trials of each completed,

The authors noted a significant three-way interaction between listening task, nostril dominance, and nostril assignment, UNB appeared to induce activity in the detection of emotional tones in right nostril dominant participants, UNB did not, however, seem to affect,

successful social interaction relies on immediate perception of both visual and auditory emotional cues as well as multi sensory integration (MSI),

The high functioning adults with PDD and thirteen cognitively healthy adult controls participated in the study. All were given the Wechsler Adult Intelligence Scale, Dutch edition (WAIS-III), and were also found to be free of other neurological disorders and substance abuse. PDD adults and controls were matched for age and IQ scores. Subjects were compared while processing fearful faces and happy faces. MSI was studied, using EEG, by distinguishing the effects of cross-modal presentation, such as happy facial expressions were partnered with congruent or incongruent emotionally-toned audio. Subjects were permitted to take all the time they needed to come to their answers.

It was found that the PDD individuals differed from the controls in their MSI of fearful information from visual and auditory samples. Although both groups showed similar readings concerning visual emotion processing, the PDD group showed irregularities in processing of the fearful face combinations. The authors state that, because of the importance of immediate MSI for social competence, MSI differences in PDD may be correlated to the deficits shown in their emotional behavior. Deficits in one's ability to detect and understand the emotions of others are seen in socially inept disorders, such as schizophrenia, as well,

Blair and Mitchell (2006) echo the sentiments of the above researchers, as they state that the processing of emotional expressions is fundamental for normal socialization and interaction. They studied the ability of schizotypal and non-schizotypal adults to process emotional prosody. They used the State Psychology Inventory (SPI) to assess

R, D, 5are, 1??1/, to determine ea h su);e t's status,

"he e4*eriment onsisted o! t&o grou*s, "hirtyInine men *arti i*ated all together, All &ere in ar erated indi+iduals &ho &ere se*arated)ased on their diagnosis o! *sy ho*athy, Blair et al .(BB(/ *resented *arti i*ants &ith neutral &ords that &ere s*o\$en &ith intonations on+eying ha**iness, disgust, anger, sadness, or !ear, Parti i*ants &ere as\$ed to identi!y the emotion o! the s*ea\$er)ased on +o al a!!e t, not the de!inition o! the &ord, Su);e ts &ere gi+en as mu h time as they needed to ans&er ea h, "he hoi es o! &hi h emotion might)e heard &ere ontinuously a+aila)le !or the *arti i*ants to +ie&, !t should)e noted that these ad+antages, &hi h &ere also seen in the *re+ious study, &ould not)e a+aila)le during real!!i!e intera tions,

!t &as !ound that *sy ho*athi indi+iduals &ere se+erely im*aired in identi!ying !ear!ul +oi e intonations, "here &as also a strong orrelation !ound)et&een a high s ore on the *sy ho*athy s ale and an im*aired a)ility to identi!y sad +o al a!!e t, "here &as no signi!i ant di!!eren e seen)et&een the t&o grou*s and their a)ility to re ogni0e other emotional tones,

Blair and olleagues .(BB(/)elie+e that these !indieth!M"dehen the laims that *sy ho*athy is a neuro! ogniti+e disorder, "hey state that it is a**arent a ross a *erson's li!els*an as hildren &ho dis*lay *sy ho*athi tenden ies also sho& su h im*airments, "hese, o! ourse, ould)e onsidered e4!Rne ases!! yet a+erage *eo*le an ha+e di!!i ulty *i \$ing u* on the su)tle emotional ues o! others as &ell, "his is something than im*air the -uality o! one's inter*ersonallationshi*s and e+en ones o u*ation,

Ste&art and Reynolds .(BB(/ re+ie& the im*ortan e o! em*athy in do tor!atient intera tions and -uality o! are, "hey state that em*athy is a multi!dimensional on e*t

with moral, cognitive, emotional, and behavioral components, Research in the areas of mental health and nursing has shown that it plays a key role in care,

Minimal empathy is defined as encompassing an ability to understand a patient's situation, perspective, and feelings and attached meanings, to communicate that understanding and help its accuracy, and to act on this understanding in a helpful and therapeutic way for the patient. Stewart, et al, (2007), Emotionally, empathy calls for an ability to experience and share in another's emotional state and feelings. Morally, they claim an altruistic force should be present, Empathy also calls for the cognitive ability to identify and understand another's emotional state objectively, Finally, it requires the behavioral ability to convey the understanding of a person's feelings to that individual and respond appropriately,

When all of the above are present, empathy can improve outcomes in the consultation process, Stewart and colleagues. (2007) believe that empathetic consulting in primary care should be encouraged, "they state that empathy can be successfully taught in medical school, especially if it is done during the student's actual interaction with patients using role played experiential teaching methods, "they believe that the human dimension of the clinical encounter is important and that the tradition of holism or holistic health/ is a strong basis,

For a person, such as a doctor, nurse, therapist, or everyday individual for that matter, these abilities are not only essential but also

s*e ulate that loo\$ing at this area might hel* in the understanding and treatment o!
ogniti+e disorders su h as PDD and *sy ho*athy as &ell,

6! the laims gi+en to ANB, UNB, and other *ranayama te hni-ues are orre t,
one should &onder &hy they are not)eing utili0ed more o!ten in *sy hology, medi ine,
the &or\$ *la e, or e+eryday !un tioning, %learly, they ould *otentially hold *ra ti al
a**li ations, *ossi)ly hel*ing to naturally im*ro+e !un tioning and e!!i ien y, "he a)o+e
studies do *ose a !e& -uestions themsel+es, es*e ially in relation to UNB,

Does *ra ti ing UNB !or a s*e i!i hemis*here truly hange the)rain>s
*er!orman e in ertain tas\$sL : ould a *erson>s a)ility to dete t emotional a!le t)e
signi!i antly enhan ed &ith its *ra ti eL : ould their em*athy)e signi!i antly in reased
as a resultL "hese are some o! the -uestions the urrent study attem*ted to ans&er, "his
study hy*thesi0ed that le!t!sided UNB .2UNB/,)ringing !orth right!hemis*here
dominan e, &ould)e !ound to in rease a *erson>s a)ility to dete t and orre tly identi!
another>s emotional tone,

Method

Participants

No compensation was supplied by the researchers; however, all were thanked for their time, efforts, and cooperation in the experiment.

Materials

it for 15 minutes before taking part in the same exercise again to see what effect, if any, it might have on their perception of these tones, "the form did not state what the potential effect was expected to be,

"the informed consent form made it clear that their participation in this experiment was completely voluntary and that not participating would not involve any penalty, it made them aware of any potential compensation and stated that they were responsible for making sure any credit that they were entitled to was received,

their dominant nostril by alternately breathing through each, one at a time, to see which was the easiest to breathe through, they recorded this on their worksheet, "the first part of testing then began,

Subjects listened to the EP" .Dreen et al., (BB1/ and filled out the corresponding worksheet, After completion of this first round, subjects were either taught a deep diaphragmatic breathing .see *roto ol in)o4)elo&/ and asked to practice this breath for 1B minutes or UNB in either the left or right nostrils .see *roto ol in)o4)elo&/, again, practicing for 1B minutes, this depended on which group they were randomly assigned to, Subjects were then asked to fill their worksheet over to once again test their ability to detect emotions, using the same recordings, Practice time was not considered to be an issue as all subjects had the same chance of correctly or incorrectly identifying the information regardless,

Once complete, all worksheets were collected and a debriefing form was handed out, this form requested that had taken place and stated the hypothesis of the study, thanked all for their participation and supplied the contact information of the researcher and finally once more, if subjects had any further questions, comments, or concerns, or desired to view the results of the study upon completion, they were invited to contact the researcher,

Diaphragmatic Breathing:

Subjects were asked to take slow, smooth breaths in and out as described previously in the Appendix

na+els to&ard their s*ines,8 using their a)dominal mus les to e4*el the air !ully !rom the lungs, "his dee*)reathing te hni-ue &as re*eated until e+eryone !elt om!orta)le and &as then *ra ti ed !or 1B minutes,

Unilateral Nostril Breathing .UNB/:

Su);e ts &ere instru ted to !old the inde4 and middle !ingers o! their right hand in to&ard the enter o! their *alms, "heir ring and *in\$y !ingers &ere to stay together and e4tended, thum) also e4tended, 6! this &as too di!!i ult, they &ere *ermitted to rest the ti*s o! the inde4 and middle !ingers on the !orehead in!)et&een the eye)ro&s, holding the other !ingers in the same &ay as des ri)ed a)o+e, 6! still too di!!i ult, they &ere as\$ed to sim*ly !old the middle, ring, and *in\$y !ingers in, and e4tend the inde4 and thum) only, "he !irst, and the se ond, hand *ositions are the traditional &ays to *ra ti e the te hni-ue in yoga, &hi h is &hy they &ere as\$ed to try these !irst,

6! assigned to le!t!sided UNB .2UNB/, the hand &as held u* to the nose and the thum), in any *osition, &as used to lose the right nostril, "he *arti i*ant &as told to inhale !ully through the le!t nostril, using slo&, dee*, steady)reathing, "hey &ere then as\$ed to *in h)oth nostrils losed, hold, and then release the thum) !rom the right nostril, still losing the le!t, to e4hale !ully !rom there, Su);e ts then *in hed the nostrils losed on e more and re*eated, inhaling through the le!t again and e4haling through the right,

6! assigned to right!sided UNB .RUNB/ the a)o+e &as *ra ti ed in the same &ay)ut in a re+erse order, 6nstead o! inhaling through the le!t, su);e ts o*ened the right nostril !irst, inhaled, and *in hed!! o*en the le!t nostril, e4haled, *in hed, and re*eated this *attern, 'ust as &ith the dia*hragmati)reathing, *arti i*ants *ra ti ed)rie!ly, until

emotions do not seem to produce statistical differences in these tests is left to speculation, Perhaps the detection of fear is one of the most necessary from a survival standpoint and this might be why it produces the strongest, and in these cases the only, effect in testing. Both positive and negative, in the present research, it was originally anticipated that differences would be found on all of the emotional subtests, As with most studies, limitations must be taken into account,

The use of convenient sampling caused issues in judging the homogeneousness of the participants, the large majority of subjects were (1 something 1 year 1 old %au asian females and all volunteers were college students, One could argue that this might make it difficult to generalize results to the rest of the population, It is interesting to note that the majority of left handed participants were found in the 2UNB group as well, the sample size was a small one to start with from the beginning, the removal of the control as further limiting, finally, conducting the experiment in group settings proved less than ideal as it was unclear if all participants had successfully learned and properly performed the pranayama techniques, Unfortunately, while right nostril dominant was documented, most right nostril dominant was not recorded, this could have been useful in confirming that the correct dominant was in place for each group during the post EP", the presence of so many other subjects could have been a distraction as well,

Suggestions for future research would be to obtain a larger and more diverse sample and to perform the experiment on a one-on-one basis in order to guarantee that subjects are properly trained in, and performing, the breathing techniques, or further assurance, documenting most right nostril dominant, or better yet, utilizing EED techniques could be superlatively, it may be necessary to include left handed and ambidextrous

*arti i*ants in order to o)tain learner results in the !uture as &ell,

"he results o! this study hel* to e4*and and ontri)ute to the urrent)ody o!

References

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Ste&art, M, :,, I Reynolds, : , ' , .(BB(/ Em*athy and -uality o! are, /ritish Journal

"a)le 1, Mean Pre|Post Di!!eren es on the EP" among 2UNB, RUNB, and %ontrol

.Dia*hragmati Breathing/ Drou*s,

	2e!t	%ontrol	Right	F	p	
5a**y	1B,A3	1B,@3	1B,C(B,(@	B,FAC	
Angry	1B,A3	1B,3?	1B,(F	B,(?	B,FA1	
9ear	B,BA	1B,CF	1B,F3	1,C<	B,(B<	
Neutral		1B,1C	B,((1B,(F	B,C?	B,ABF
Sad	B,3F	B,BC	B,FF	1,?3	B,1AA	

"a)le (, Estimated Marginal Means, Signifi ant di!!eren e sho&n in)old!a e ty*e,

2UNB	RUNB
Mean S	Mean S

Figure 1, Estimated Marginal Means of 2UNB .1/ +s RUNB .(/,

B1BBB?BBBBB3F<BBBBBBB(BB1 BBBB BBBB<BBBBBB3B1B@BBBABBBBBB)B(BBBBBBBB
BABBBBBB B(edB@(CB)B<BBBBB(eB11@BB1 BBBB!)B(? !BBBBBBBBBBBB?BB1BBBBB
BBBB<<BBB1(A<C?CdCAF3(B<eCAFF(BA(C!CdC1CeBBBBBBBBBBBBBBBBBBBBBBBBBBBBB
BBBB<BBBBB(dB1BBBB<BBBBBB(B1B1BBBABBBBBB?B(BBBBBB(BdBBBBB3(BaAaBBB
BBBB1BBB<BBBBBBBBB((B)e?B@(Bd?(dBB1 BBBB!)B(1BBBFBBBBBBBBB) B(BBBBB
BBBB1B(B((A3F?F3F<CACdBBBBBBBBBBBBBBBBBBB1@BBBBBB1BBBBB?BFa3<B(e<B<B
BBBB<BBBBB(dB1B1BBB3BBBBBBBBBBB