

# Understanding Views on Sentience and Conservation: A Study of Emotional Experiences with Wildlife

## Authors

Cpcc'Tgkm{.'Cpplg'N{pej . 'Mcvk'Tlej ctf u.'P gmg'F qwi rcu. cpf 'Nk{ 'Lghgt {

Gpxkqpo gpvcn'Uwf lgu'Rtqi tco . 'Dquvp'Eqmgi g.'Dquvp. O C.'24689.'WUC

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Igppkgt'Tgdgeec'Uej cwtg.'649'O eI wkpp.'F gr ctvo gpvqh'Uqekqmi {.'Dquvp'Eqmgi g.'Dquvp.  
O C'24689=[ngm{ clhB deQf w](#)

## Authors' Contributions

CT.'CN.'MT.'P F.'cpf 'NL'f guki pgf 'vj g'r tqlgv'cpf 'eq/y tqvg vj g'o cpwuetkr 0

## Running Title

Xlgy u'qp'Ugpkpeg'cpf 'Eqpugtxcvqp

## Keywords

Ugpkpeg="eqpugtxcvqp="dkqf kxgtuk{ =y kf rkg="eqgz kvgpeg

## Word Count

; 54:

## Article Impact Statement

Vj ku'r cr gt'kf gpvkhgu'cpf 'o gcuwtgu'oj wo cp'r gtegr vqpu qh'cpko cn'ugpkpeg.ö'kpvkpi "cp  
go qvqpcn'cr r tqcej "q'tghgevkpu'qp'y kf rkg'kpvgtcevkpu. eqpugtxcvqp."cpf "dkqf kxgtuk{0

## Acknowledgements

Vj g'tgugctej gtu'y qwf 'rkg'v'vj cpn'Rtqhguqt'Igppkgt Uej cwtg.'vj g'Gpxkqpo gpvcn'Uwf lgu  
rtqi tco . 'Rtqhguqt'Vctc'RkucpkI ctgcw.'qwt'hgmy Ugpkgt'Tgugctej 'Ugo kpc't'encuo cvgu."cpf "qwt  
r ctvkr cpw'hqt'vj gk'eqvtdwkqpu'v'qwt'uwf {0

## Introduction

Vj g'tgrvkvpuj kr "dgy ggp"j wo cpu'cpf 'pqp/j wo cp'cpko cnu j cu'gxqkxgf "vj tqwi j qw"j kvqt {  
cpf "xctkgu'dgy ggp"ewmwgu."eqo o wpkkgu."cpf "kpf kxf wcn0Ur gekkccm{."j qy 'r gqr ng'xkgy "cpf  
xcnwg'pqp/j wo cp'ugpvkpeg'j cu'dggp'c'vqr ke'qh'tgugctej co qpi 'uej qrtu0Lcpg'I qqf cm'y cu'qpg  
qh'y g'htuv'gzzr gtu'vq'f kuo cpvng'y g'r qr wct'eqpegr vqh'y g'f lej qvqo { "dgy ggp"j wo cpu'cpf  
cpko cnu'd { 'r tqxkpi "vj cv'vqqr/wug."ewmwg."cpf "go qvkvpcneqppgekvq"ctg'pqv'wpls wg'vq  
j qo qucr kgpu0Uj g'lw i guvgf "vj cv'y qug'y j q"j cxg'ur gpveqpukf gtcdr'vko g'y kj "cpko cnu'tgeqi pk g  
vj cv'qwt'pqp/j wo cp'eqo r cpkqpu'cpf "y kf rkhg'r quuguu ugpvkpeg0Uj g'ct vkwrcvgf "vj cv'vqpeg" { qw  
ctg'r tgr ctgf "vq'cf o k'y cv'cpko cnu'ctg'ugpvkpv'cpf ecppqv'qpn { 'hpqy "go qvkvpu'rkng"j cr r kpguu.  
ucf pguu."hgct."dw'gur gekcm { "vj g { "ecp'hggnr clp"o vj gp."cu"j wo cpu'y kj "cf xcpegf "tgcupkpi  
r qy gtu."y g"j cxg"ctgur qpukdkkv { "vq'tgcv'y go 'kp o qtg"j wo cpg'y c { u'y cp'y g'vq'qh'vq'f qo"0Lcpg  
I qqf cm'kpvkwwg."423; +0Dgecwug"j wo cpu'r r { "c'rti g tqrg'kp'pqp/j wo cp'cpko cnu'eqpugtxcvkvq.  
vj g'gzvqv'vq'y j lej "j wo cpu'wvf gtucpf "cpf "gzzr gtlkpeg ugpvkpeg"co qpi "pqp/j wo cp'dgkpi u'o c {  
ko r cev'y g'hwmtg'qh'eqpugtxcvkvq'cpf "vj g'hwmtg'qh'j wo cp/y kf rkhg'kvgtcevkvpu'cpf "eqgzkvkpeg0  
j g'vq'vq'vq' { gctu."gzzr gtu"j cxg"ecmgf "hqt"vj g'f kuo cpvkvpi qh'tcf kvkpcn'dkpcctkgu'dgy ggp"j qo q  
ucr kgpu'cpf "pqp/j wo cp'cpko cnu" | f go k'lw i guu'y g dtgcm'y g'dkpc { "dgy ggp"j wo cpu'cpf  
pqp/j wo cp'cpko cnu'cpf "dgy ggp"j wo cpu'cpf "pcwtg'y kj i qxgtcpeg'htco gy qtm'rkng"oQpg  
P cwtg0"Uvej "c'r ctf ki o "ecm'hqt"j wo cpu'vq"o qxg dg { qpf "cp'y tqr qegpv'ke'y c { u'qh'y kpnkpi  
cpf "qr gtcvki "y kj kp'y g'i nqcn'gequ { ugo 0Vj ku'dgi kpu y kj "tgeqi pk kpi "cpko cnu'ugpvkpeg  
\* | f go kt."4242"2

## Problem

Cu'j wo cpu"eqvkw'q"gpctqcej 'w qp"pcwtcrif cdkcw.

ugpvkpv'dgkpi u'lp'qtf gt'vq'tgeqi pk g'qwt'eqo o qp'r meg'qp'Gctvj 0Y kj lp'y ku'eqo o wpkv'ugvki .  
y g'y cpv'q'hqvg't'o gcpki hwt'ghgevkpu'cdqw'j wo cp/cpk cnkpvgtcev'qpu'vj cv'y knkphwpeg  
r ctvek cpw'qy p'nxgu0k'qwt'ecm'hqt'y tkwgp'pcttcv'xgu. y g'ctg'j qr kpi 'vq'j cxg'cp'ko o gf kvg  
ghgev'qp'dqj 'vj g'tgugtej gtu'cpf "'vj g'r ctvek cpw0Dwrf kpi 'qh'h'qh'Tlej ctf uqp'kf gcu.'vj g  
tgugtej gtu'dgn'xg'vj cv'y tkkpi 'r tqegu'y knkpk'cv'f kvexgt { 'hqt'vj g'r ctvek cpw.'kpv kt g  
eqppgev'qp'dgy ggp'j wo cp'r ctvek cpw'cpf 'ugpvkpv'k'g.'cu'y gml'cu'r tqf weg'o gcpki 'cpf 'etgcv  
pgy 'cy ctgpgu'qh'tgcrk' 'lp'vj g'r tqegu'\*Tlej ctf uqp. 4223-0Vj g'tgugtej gtu'cempqy ngf i g'vj cv  
y tkkpi 'ecppqv'dg'wv'k'p'gf 'h'qo 'vj g'h'g'g'zr gtlgpegu qh'vj qug'y d

vq'cempqy rñfi g'cpf 'uj ctg'vj g'r gtuqpcnr gtur gevkgu'qh'cm'tgugctej gtu'kpxqkxgf . 'j g'gk0Gcej  
cwj qt'dtkpi u'wpls w'g'zr g'kgegu.'gf wecvkp.'cpf 'go qvqp vq'vj g'vcdrg0Uj ctkpi 'vj gug'r gtur gevkgu  
etgcvgu'c'o qtg'qr gp'cpf 'r gtuqpcnr'eqppgev'kgp'dgwy ggp vj g'tgugctej gtu'cpf 'vj g'tgcf gtu'k'vj gkt  
y qtm'Vtngxu'cpf 'eqmgi wgu'kpenf g'c'ugevqp'y j g'g vj g{'cempqy rñfi g'cpf 'uj ctg'vj gkt'xct{kpi  
qr kpkpu'cpf 'xky r qkpw'qp'vj g'vqr k'qh'r tgugtxcvkp0Vj g'cwj qtu'uj ctg'vj cv'y j k'vj g{'cm'tg  
r cuukqpcv'cdqw'vj g'uwdlgev'cpf 'ctg'eqpvtkdwkpi k'vngewcne'eqpv'v'q'vj g'ctveng.'vj g{'ctg'p'qv  
cm'r gthge'v'c'ri pgf 'k'vj gkt'xky u'qh'pqp/j wo cp cpko c'ntki j u'v'Vtngxu'gv'c'f'423; +0Uko k'ctn'f.  
y g'j qf 'xct{kpi 'qr kpkpu'cpf 'd'g'khu'qp'vj g'vqr k'qh'pqp/j wo cp'cpko c'nt'ugpv'k'peg'cpf  
eqpugt'xcv'kp0Vj wu.'Vtngxu'cpf 'eqmgi wgu'j cxg'k'pur k'gf vj ku'ugevqp.'y j k'ej 'y g'j cxg'ej qugp'v'q  
f gf k'cv'v'q'vj g'r gtuqpcnr'pctt'cvkgu'qh'vj g'tgugctej gtu0

Lghgt {'d'g'kxgu'vj cv'f geqput'w'kpi 'vj g'f ggr n' /tqqv'f . j k'gtctej k'c'nt'gr'v'k'puj k' 'dgwy ggp  
j wo cpu'cpf 'pqp/j wo cp'cpko c'nt'ku'gu'gp'v'c'f'0Grko k'cv'kpi vj gug'r t'geqpeg'k'gf 'p'q'v'k'pu'qh'j wo cp  
uwr g'k'q'k'v' 'cpf 'r'g'c'kpi 'k'v'q'vj g'ugpv'k'p'c'w'g'q'h'cm'd'g'kpi u'y k'nt'cm'y 'cm'ur g'elgu'v' 'eqgz'ku'v'qp  
Gct'vj 'k'p'c' 'eqo r cuukqpcv'g'o c'ppgt' 'cpf 't'gf w'eg'vj g'ugxgt'g j cdk'cv'f k'ut'w' v'k'p' 'cpf 'u'wd'ugs w'gpv  
dk'f k'x'gt'uk'v' 'r'qu'v'y g'ewt'gp'v' 'h'ceg0

F qwi r'cu'cti wgu'vj cv'ugpv'k'peg'ku'vj g'ut'qpi gu'v'eqppgev'k'p' u'j ctg'f 'dgwy ggp'j wo cpu'cpf  
pqp/j wo cp'cpko c'nt'v' wu.'k'ku'vj g'f w'v' 'qh'j wo cpu v'q't'geqi p'k' g'vj cv'uj ctg'f 'ugpv'k'peg'ku'k'p'f k'gev  
eq'p'hr'ev'y k'j 'cp'v'j t'qr q'eg'p'v'k'uo . 'y j k'ej 'j cu'f t'k'x'gp'vj g'f g'ut'w'v'k'p' 'qh'p'c'w'c'nt'j cdk'cv'0Y j k'g  
eq'p'egr w'q'h'ugpv'k'peg'o c{' 'dg'v'q'q'c'd'ut'cev' 'cpf 'h'q't'g'k' p' h'q't' 'u'qo g'k'p'f k'k'f w'c'u'v'q' 'qr g'p'n' 'go dt'ceg.  
T'g'k'nt' 'ci t'ggu'y k'j 'F qwi r'cu'vj cv'c'w'k'w'f gu'v'q'y c't'f u'j wo cp/cpko c'nt'gr'v'k'pu'o w'u'd'g't'geq'p'uk'f g'g'f  
d{' 'vj g' 'eqo o q'p'r q'r w'v'k'p' 'h'q't' 't'g'c'nr'eq'p'ugt'xcv'k'p'v'q' q'ewt'0T'g'k'nt' 'h'g'gu'v'j cv'cp'v'j t'qr q'eg'p'v'k'uo 'ku'v'q  
f g'g'r n' 'k'pi t'c'k'p'g'f 'k'p'v'q'f c{' 'u'v'q'ek'v'k'gu'v'j cv'k'p'f k'k'f w'c'u' o c{' 'p'g'g'f 'v'ko g'v'q' 'ceer'ko cv'g'v'q'v'j g'uj k'k'pi

r ctf ki o . "qt "gnug" yj g{ 'o c{ 't'gl'gev' yj gug'kf' gcu'qwt'ki j '0'Vj wu. 'T'gkm{ 'h'ggu' yj cv' yj g' dguv' cr r tqcej 'ku  
vq' gcug' r gqr r g' k'p'v' yj gug' f' k'uewu' k'qpu. "gur gekm{ 'kh' yj g{ "ctg' v'phco k'kct' y' kj ' yj g' v'qr' leu0

N{ pej 'ku' eqo r gmgf 'v' f' geqpust wev' f' qo k'pcpv' ur gekgu ecv' gi q' t'kgu' c'pf ' y' q' t' m'ci cl'p'uv' yj g  
j wo cp' g' zegr v' k'p'cr' ku' h' t' co gy q' t' n' 0' k'p'ur k' t' g' f' d{ ' yj g' y' q' t' m' q' h' M' k' t' m' u' g{ "c' p' f' " J' g' m' t' g' l' e' j' " \*4232+ " N{ pej  
j q' r' gu' v' q' d' t' k' p' i' k' p' r' g' t' ur g' e' v' x' g' u' q' h' g' s' w' e' r' k' v' { . ' t' g' r' n' e' k' p' i' yj g' r' e' p' i' w' e' i' g' q' h' p' q' p' j' wo cp' ur gekgu' y' kj  
o w' m' k' ur gekgu' v' p' f' g' t' u' w' c' p' f' k' p' i' 0' C' f' f' k' k' q' p' c' m' f' . ' k' v' k' u' k' o' r' g' t' e' v' x' g' v' q' c' f' x' c' p' e' g' q' w' t' Y' g' u' g' t' p' r' w' d' r' k' e  
w' p' f' g' t' u' w' c' p' f' k' p' i' " q' h' c' p' k' o' c' n' i' u' g' p' v' k' e' p' e' g' d' g' { q' p' f' " w' k' k' c' t' k' e' p' x' c' n' e' v' k' q' p' q' h' ur gekgu. "c' p' f' " v' q' y' c' t' f' u' c' p'  
w' p' f' g' t' u' w' c' p' f' k' p' i' " q' h' o' w' m' k' ur gekgu' c' u' i' q' q' f' " v' q' r' i' x' g' y' k' j . c' p' f' " c' o' q' p' i' " \*M' k' t' m' u' g{ "c' p' f' " J' g' m' t' g' l' e' j' . "4232+0

T' l' e' j' c' t' f' u' d' g' r' i' g' x' g' u' yj cv' yj g' d' k' p' c' t' k' e' u' yj cv' g' z' k' u' v' u' g' r' c' t' e' v' k' p' i' p' q' p' j' wo cp' c' p' k' o' c' n' i' h' t' q' o' " j' wo c' p' u  
c' t' g' j' c' t' o' h' w' i' h' q' t' " c' m' i' ur gekgu 0' k' u' k' p' c' m' i' ur gekgu d' g' u' v' k' p' v' g' t' g' u' v' yj cv' u' w' e' j' " d' k' p' c' t' k' e' u' c' p' f' " j' k' e' t' c' t' e' j' k' e' u' c' t' g'  
f' k' u' o' c' p' v' r' g' f' " d' g' e' c' w' u' g' c' m' i' r' k' x' g' u' j' c' x' g' l' p' j' g' t' g' p' v' x' c' n' e' g' 0' T' l' e' j' c' t' f' u' j' q' r' g' u' v' yj cv' g' p' i' c' i' k' p' i' " k' p' e' t' k' e' c' n' i' c' p' f'  
g' p' t' l' e' j' k' p' i' " e' q' p' x' g' t' u' w' c' p' u' c' d' q' w' c' p' k' o' c' n' i' u' g' p' v' k' e' p' e' g' k' u' c' p' k' o' r' q' t' v' c' p' v' u' g' r' " k' p' d' t' g' e' n' k' p' i' " f' q' y' p' v' yj g' u' g'  
v' t' c' f' k' k' q' p' c' n' i' d' c' t' t' k' e' t' u' 0

### Trends in Existing Literature

Vj g' g' z' k' u' k' p' i' " d' q' f' { " q' h' t' g' u' g' c' t' e' j' " g' z' r' m' t' g' u' yj g' t' q' r' g' q' h' x' c' n' e' g' u. " c' v' k' w' f' g' u. " c' p' f' " f' k' t' g' e' v' k' p' v' g' t' c' e' v' k' p' u  
q' p' v' yj g' t' g' r' v' k' p' u' j' k' r' " d' g' y' g' g' p' j' wo cp' c' p' f' " p' q' p' j' wo cp' e' t' g' c' w' t' g' u. e' k' k' g' p' o' q' p' k' q' t' k' p' i' . " c' p' f'  
e' q' p' u' g' t' x' c' v' k' p' r' t' c' e' v' k' e' u' 0' Vj g' t' g' c' t' g' c' x' c' t' k' e' v' { " q' h' t' g' p' f' u' g' u' r' g' e' k' m' { " u' c' n' i' g' p' v' v' q' h' w' w' t' g' t' g' u' g' c' t' e' j' " q' p' v' yj g'  
t' q' r' g' q' h' u' g' p' v' k' e' p' e' g' k' p' o' q' v' k' c' v' k' p' u' h' q' t' " d' g' w' g' t' v' t' g' c' v' o' g' p' v' q' h' y' k' f' r' i' k' g' 0' P' wo g' t' q' w' u' w' f' k' e' u' j' k' i' j' r' i' k' i' j' v' yj g'  
k' o' r' q' t' v' c' p' e' g' q' h' e' q' o' r' c' u' u' k' q' p' k' p' j' wo cp' c' v' k' w' f' g' u' v' q' y' c' t' f' u' y' k' f' r' i' k' g' . " t' g' r' q' t' v' k' p' i' " g' o' q' v' k' p' c' n' i' x' c' t' k' e' d' r' g' u' c' u'  
y' j' g' u' t' q' p' i' g' u' v' r' t' g' f' k' e' v' q' t' " q' h' y' k' f' r' i' k' g' o' c' p' c' i' g' o' g' p' v' q' h' j' q' w' u' g' u' r' c' t' t' q' y' u= c' p' f' . " yj cv' j' wo cp' g' o' r' c' v' j' {  
v' q' y' c' t' f' " c' p' k' o' c' n' i' c' p' f' " u' t' q' p' i' g' t' h' g' g' r' k' p' i' u' c' d' q' w' u' g' p' v' k' e' p' e' g' o' c' { " r' g' c' f' " v' q' d' g' w' g' t' v' t' g' c' v' o' g' p' v' q' h' c' p' k' o' c' n' i'  
\*N' c' t' u' q' p' g' v' c' r' i' 0' 4238= E' q' t' p' k' u' j' " g' v' c' r' i' 0' 423: +0' G' o' r' c' v' j' g' v' e' v' t' g' c' v' o' g' p' v' q' h' c' p' k' o' c' n' i' g' z' v' g' p' f' u' v' q'



r gtur gevkg"FF qnd{. '4242+0F qnd{ a'go r j cuku'qp'go r cvj { 'k'j' gt'uwf { 'cpf' j' gt'wug'qh'eqmgi g  
uwf gpw'cu'r ctvkr cpw'ctg'vy q'vj kpi u'y g'f' r'kg vq'o kttq'k'p'qwt'uwf {0Y cmcej 'cpf' 'eqmgi wgu  
cti wg'hqt'vj g'ko r ngo gpv'vqp'qh'eqo r cuukqpcv'eqpugtxcv'kqp. c'hqto 'qh'eqpugtxcv'kqp'k'y j lej 'cm  
pqp/j wo cp'cpko cn'uwldgeu'ctg'tgcvgf 'cu'ugpv'kpv'dgkpi u'cpf 'ctg'uggp'hqt'vj gkt'k'p't'k'p'k'p'k'k'x'c'w'g  
\*Y cmcej 'g'v'cn'0'423: +0Vj g'cwj qtu'uwf k'g'f 'x'ct'k'q'w'ec'ugu'qh'c'p'ko cn'eqpugtxcv'kqp'cpf 'et'k'k's'w'g'vj g  
y c{u'vj g{ 'k' p'q't'g'c'p'ko cn'ugpv'k'p'eg'c'p'f 'ce'v'y' k'j 'c'p' c'p'v'j' t'q'r' q'eg'p't'k'c'ug'v'q'h'i' q'c'u' \*Y cmcej 'g'v'cn'  
423: +0Y j k'g'y g'y k'n'p'q'v'd'g'c'p'cn' | k'p' i' e'w't't'g'p'v'eqpugtxcv'kqp g'h'q't'w' .y g'y k'n'd'g'k'p'x'g'u'k'i' c'v'k'p'i 'vj g  
t'g'r'v'k'p'uj k' 'd'g'y g'g'p'x'k'g'y u'q'p'p'q'p/j wo cp'cpko cn'ugpv'k'p'eg' c'u'k't'g'r'v'g'u'v'q'c'w'k'w'f'g'u'v'q'y c't'f' u  
eqpugtxcv'kqp00 c'p'h'g'f'q'c'p'f 'eqmgi wgu.'vj t'q'w'i' j 'vj gkt' c'p'cn' u'k'u'q'h'u'q'ek'q'ew'w't'c'n'x'c'w'g'u'q'p'y k'f' r'k'h'g  
eqpugtxcv'kqp.'f' g'h'k'p'g'x'c'w'g'u' { u'v'go u'vj t'q'w'i' j 'o' c'v'g't'k'c'ew'w't'g' .u'v'q't'k'g'u' .x'c'w'g'u' { u'v'go u'c'p'f 'o' q't'g  
\*4242+0Vj k'u'uwf { 'c'u'g'u'g'u'v'j g'ko r ce'v'q'h'x'c'w'g'u'v'q'y c't'f' u' p'q'p/j wo cp'cpko c'n'q'p'y k'f' r'k'h'g  
eqpugtxcv'kqp'd'g'r'k'h'0'Q'w't'u'w'f { 'y' k'n'ug'g'm'v'q' 'u'ko k'r'c't'n'f' c'u'g'u'v'j' q'y 'x'k'g'y u'q'p'y k'f' r'k'h'g'ug'p'v'k'p'eg  
ko r ce'v'r' g't'eg'r' v'k'p'u'q'h'y k'f' r'k'h'g'eqpugtxcv'kqp'vj t'q'w'i' j u'v'q't'k'g'u' .r'j' q'v'q'u' .c'p'f' 'q'v'j' g't' 'u'w'ej' 'o' g'f' k'w'o u'0'k'p'  
q'w't'f'c'v'c'eq'm'g'ev'k'p'r' g't'k'q'f' 'y' g'c'k'o 'v'q' 'h'q'u'g't'c' 'y' c't'o' c'p'f' 'c'e'eg'r' v'k'p'i' 'g'p'x'k't'q'p'o' g'p'v'h'q't' 'vj' g  
r'c't'v'k'r' c'p'w'k'p'q'w't'f' k'u'ew'u'k'q'p'i' t'q'w'r' 'y' j' g't'g'v'j' g{ 'y' k'n'd'g'k'p'x'k'g'f' 'v'q' 't'w'f' 'g'z'r' n'q't'g'v'j' g't' 'vj' q'w'i' j' u'c'p'f'  
h'g'r'k'p'i' u'c'd'q'w'c'p'ko cn'ugpv'k'p'eg0'U'ko k'r'c't'n'f' 'v'q' 'F' q'nd{. y g'y k'n'g'p'eq'w't'c'i' g'r'c't'v'k'r' c'p'w'v'q' 'r' w  
vj' g'o' u'g'r'k'g'u'k'p' 'vj' g'q'v'j' g't' 'd'g'k'p'i' a'r' r'c'eg'c'p'f' 't' { 'v'q' 'k'p'v'g'r' t'g'v'c'p'f' 't'g'eg'k'g' 'vj' g't' 'g'p'g't'i' { 'c'p'f' 'g'o' q'v'k'p'u'0  
Y g'y k'n'r' t'q'o' r' v'vj' g'uwf { 'r'c't'v'k'r' c'p'w'v'q' 'vj' q'w'i' j' v'w'm'f' t'g'h'g'ev'w'r' q'p' 'vj' g't' 'k'p'v'g't'c'ev'k'p'u'v'j' k'j  
p'q'p'j' wo c'p'y k'f' r'k'h'g'c'p'ko c'n'0'Y g'y c'p'v'q' 'e'c'm'c'w'g'p'v'k'p' v'q' 'vj' g'v'p'k's' w'g' 'g'p'g't'i' g'v'k'e' 'd'q'p'f' 'vj' c'v'k'u'v'j' c't'g'f'  
d'g'y g'g'p' 'v'y' q' 'u'g'p'v'k'p'v'd'g'k'p'i' u'0'Y g'y k'n'g'p'eq'w't'c'i' g'q'w't' r'c't'v'k'r' c'p'w'v'q' 'd't'k'p'i' 'c'p' 'g'x'g't' 'r' t'g'ug'p'v'  
c'y c't'g'p'g'u'u'q'h'eq'p'ue'k'q'w'p'g'u'u'v'j' c'v'c'm'f'k'x'k'p'i' 'e't'g'c'w't'g'u' r' q'u'g'u'u'0'Y g'j' q'r' g'v'j' c'v'v'j' k'u'j' g'k'i' j' v'g'p'g'f'  
c'y c't'g'p'g'u'u' 'e'c'p' 'h'g'c'f' 'v'q' 'o' q't'g' 'o' g'c'p'k'p'i' h'w'f' k'u'ew'u'k'q'p' .t'g'h'g'ev'k'p' .c'p'f' 'e'q'p'v'k'p'w'g'f' 'o' w'w'c'm'f' 'd'g'p'g'h'k'c'n





r ctvkr cpw'vj tqwi j "eqpxgplgpeg"uco r npi . "cu'vj g'tgugctej gtu'lwtxg{ gf "cwgpf ggu'vq"cp"cpko cn  
y gntctg'u{o r qukwo "423: +0Kp'dqvj "uwf lgu."r ctvkr cpw j cf "ctgcf { "f go qputcvgf "c'uki pklcepv  
kpvgtguv'lp"cpko cni'cpf "cpko cni'y gmlgkpi . "y j lej 'ko r cevgf tguwu"\*Nctuqp"gv'cni"4238=Eqtpkuj "gv  
cni"423: +0Qwt'uwf { "y km'dg'htqo "c'o qtg'o kzgf "dceni tqwvf qh'r gqr ng'y kj "xctkqu'kpvgtguu."pqv  
lwv'ko kgf "vq'r gqr ng'y j q"ctgcf { "uj qy "ur gekni'kpvgtguv'lp"cpko cni

### Areas for Further Study

Y j kg'vj g'rkgtcwtg"qp'y kf rkhg"eqxgtu'dqvj "c'tcpi g qh'uwdvqr leu'cpf "eqpukf gtcdrf" f gr vj  
kp'ur gekle"ctgcu."uki pklcepvi cr u'r gtukn0Ur geklecm{ . vj gtg'ku'o wej "vq'dg'uwf kgf "qp'vj g  
r gtegr vkp"qh'cpko cni'ugpvkpeg'd{ "j wo cp'dgkpi u."j qy vj ku'ko r cevu'j wo cp/cpko cni'grvkpuj kr u.  
cpf "y j cv'ghgevu'vj ku'j cu'qp"eqpugtxcvkp"ghqtu cpf "cy ctgpguu0Nctuqp"cpf "eqmgci wgu'cpcni'uku  
qh'gzr gtlgp'kni'hcexqtu'uw r qt'u'vj g'dgrkh'vj cv'gzr gtlgpegu y kj "y kf rkhg'utgpi vj gp"chgevkxg"cpf  
go qvkpcni'tgur qpugu'vq'y kf rkhg'uko wk"\*Nctuqp."gv'cni"4238+0Vj ku'uwf { "qr gpu'wr "cp'ctgc'ht  
tgugctej "qp'vj g'tqng'qh'wvf gtucpf kpi "cpf "cr r tgekvkq qh'ugpvkpeg'ht"vj g'htto cvkq"qh  
go qvkpcni'f kur quk'kpu'cpf "cvkwf gu'vqy ctf "y kf rkhg0Vj g'y qtn'qh'Eqtpkuj "cpf "eqmgci wgu  
ulo krcni' "etgcvgu'vj g'r qvgp'kni'ht'hw'vj gt'tgugctej qp'y j cv'gzcew' "o qv'xcvgu'r gqr ng'vq"eqppgev'vq  
cpko cni'ugpvkpeg"\*423: +0Y j kg'vj g'tgugctej gtu'gzco kpg f go qi tcr j le'hcexqtu'vj cv'kphwpeg

r t g x l q w u n { ' d g g p ' c w g o r v g f ' k p ' q v j g t ' t g u g c t e j 0 Y g ' y k m l r t q o r v ' j g ' u w f { ' r c t v l e k r c p w u ' v q  
v j q w i j v h w m { ' t g h r g e v ' w r q p ' v j g k ' k p v g t c e v k a p u ' y k j p q p j w o c p ' y k f r k h g ' c p k o c n u 0 Y g ' y c p v ' v q ' e c m  
c v g p v k a p ' v q ' v j g ' w p k s w g ' g p g t i g l e ' d a p f ' v j c v ' k u ' u j c t g f d g w y g g p ' y q ' u g p v k e p v ' d g k p i u 0 Y g ' y k m  
g p e q w t c i g ' q w t ' r c t v l e k r c p w u ' v q ' d t k p i ' c p ' g x g t ' r t g u g p v c y c t g p g u u ' q h ' e q p u e k q w a p g u u ' v j c v ' c m l h k k p i  
e t g c w t g u ' r q u u g u u 0 Y g ' j q r g ' v j c v ' v j k u ' j g k i j v g p g f ' c y c t g p g u u e c p ' r g c f ' v q ' o q t g ' o g c p k p i h w n  
f k u e w u k a p . ' t g h r g e v k a p . ' c p f ' e q p v k p w g f ' o w w c m { ' d g p g h e k e n k p v g t c e v k a p u ' d g w y g g p ' q w t ' u w f {  
r c t v l e k r c p w u ' c p f ' c p { ' p q p j w o c p ' y k f r k h g ' c p k o c n u ' v j g { o c { ' g p e q w p v g t 0

### Research Question

Y j c v ' o q v k c v g u ' r c t v l e k r c p w u ' v q ' e q p p g e v ' v q ' c p k o c n u ' g p v k e p e g . c p f ' j q y ' e q w f ' v j k u  
o q v k c v k a p ' r g c f ' v q ' d g w g t ' t g c w o g p v ' q h ' y k f r k h g ' A Y g j q r g ' v q ' c f f ' v q ' g z k u k p i ' h v g t c w t g ' d { ' h k k p i ' v j g  
i c r u ' e q p e g t p k p i ' v j g ' g o q v k a p c n i k o r c e v ' q h ' y k f r k h g ' k p v g t c e v k a p c p f ' c e v k a p c d r g ' g h g e w ' v j k u ' j c u ' q p  
j w o c p ' d g k p i u ' v q y c t f u ' e q p u g t x c v k a p ' c p f ' y k f r k h g ' j c d k c v r t q v g e v k a p 0 K g c m { . ' y g ' y k m k f g p v k h {  
r c w g t p u ' c p f ' t g p f u ' k p ' y k f r k h g ' k p v g t c e v k a p u ' v j c v f g o q p u t c v g ' g h g e v k g ' y c { u ' v q ' g p e q w t c i g

qwt'r ctvlek cpwøqxgtcm'gzr gtlgpeg'y kj 'yj g'uwwf {0Dquxqp'Eqrngi g'uwwf gpw'ctg'wpls wg'lp'yj gk  
cdkxv\ 'vq'tghgeev.'eqo o wplkcvg.'cpf "go r cvj k g'y kj qyj gtu0Cm'Dquxqp'Eqrngi g'uwwf gpw'ctg  
tgs wktgf 'vq'eqo r rvg'yj g'Eqtg'Ewtkewnwo 'y j lej 'hqvgtu etklecn'yj kpnkpi 'unkm'cpf 'yj g'cdkxv\ 'vq  
eqo r cuikqpcvgn\ 'eqo o wplkcvg'kf gcu00 qtgqxtg.'yj g'Lguwkvxcnwgur tqo wni cvgf 'yj tqwi j qw  
Dquxqp'Eqrngi g'r ræg'c'utqpi "go r j cuku'qp'ugtxleg vq"qyj gtu'cpf 'y qtnkpi 'vq'o cm



**Data Collection Methods**

Rctvlekr cpwuy gtg'kpxkxgf "xlc"vzv."go ckn'y qtf/qh'o qwj . cpf "uqekcn'o gf kc"vq'r quv'y gk  
y kf rkhg'kpgtcevkpu"v'y'j g'Hcegdqmqni tqwr 0Rctvlekr cpwuy gtg'cungf "v'uj ctg'pcttcvkgu."r j qvqu.  
xkf gqu."qt"cwf kq'kngu"cpf "r tqo r vgf "v'tghngev"qp vj g"go qvqpcn'gzr gtlgpegu"qh'y gk'y kf rkhg  
kpgtcevkpu0C"eqo o qp"dcttkgt "hqt"ekkl gp"uekgpeg tgugctej "ku'uwvckpgf "gpi ci go gpv'cpf  
eqo o ko gpv'qh'r ctvlekr cpwuy \*Rcrgeq'gv'cn0"4243+0Y g'clo "v'cf f tguu'y ku'ej cmgpi g'd{ "qhgtkpi  
o wvkr ng'r tqlgv'gpv{ "r qkpw'cu'y gm'cu'o wvkr ng y c{ u'vq'r ctvlekr cvg"cvf khhgt gpv'hxgnu'qh  
eqo o ko gpv'lp'y'j g'Hcegdqmqni tqwr \*Rcrgeq'gv'cn0"4243+0Gzco r ngu'qh'r ctvlekr cvkqp"dg{ qpf  
r qukpi "kpenmf g'kpgtcevkpi "y kj "qyj gt'r quv'y'j tqwi j rkhgu"cpf "eqo o gpw."y v'ej kpi "rkxg'utgco  
xkf gqu'j quvgf "d{ "y'j g'tgugctej gtu."cpf "tghgtkpi "qyj gt r ctvlekr cpwuy'v'y'j g'i tqwr 0F cvc"eqmgevkap  
dgi cp"qp"Qevqdg"36."4242"cpf "eqpenmf gf "qp"Cr tkn36. 42430

**Data Analysis**

Cp"guugpvkcn'r ctv'qh'qwt "f cvc"cpcn{ uku'o gj qf "ku'eq/etgcvkp. y j lej "cmqy u'qwt"uwf { "vq  
dvkrf "c'tlej "pcttcvkg"dgvy ggp'y'j g'r ctvlekr cpwuy'cpf vj g'tgugctej gtu\*D3/pkuj /Dtgf plej ."423: +0  
D3/pkuj /Dtgf plej "go r j cuk gu'v'j cv'wpeqpxgpvqpcn'o gj qf u'qh'pcttcvkg"gy'pqi tcr j { "ctg'kp  
v'pukqp'y kj "y'j g'pggf "hqt"gy'pqi tcr j le'tgugctej "vq dg"cmgp"ugtkwun{ "cu"uqekcn'uekgpeg  
\*D3/pkuj /Dtgf plej ."r 0; ."423: +0Y j krg"{ gv"u'c"pcttcvkg dguv'ecr wtgu'v'y'j g"go qvqpu"gzr tguugf "d{  
r ctvlekr cpwuy'tgi ctv'kpi "y'j gk'y kf rkhg'kpgtcevkpu. cpf "ku'o quv'tvg"v'y'j g'pcwtg'qh'ugpvkgep0  
Hwvj gto qtg."qwt"o gj qf u'hqmqy "cp'kpwkxg"cpcn{ uku cr r tqcej "cu'qr r qugf "v'cpcn{ v'ecnl'eqf kpi  
qh'y'j g'f cvc0D3/pkuj /Dtgf plej "chko u'v'y'j krg"okv'ku'vgo r vpi "v'wtp'uvqt'kgu'kpv"v'f cvc"cpf  
f gxcnwg'y'j g'cev'qh'f ggr "kuv'kpi "cpf "pcttcvkg"eqpvgo r r'v'kqp.ö vj g'r tqegu'qh'qtf gkpi "uvqt'kgu  
kpv'pcttcvkgu'ku'dguv'i v'kf gf "d{ "c"s wcrkcvkg"cr r tqcej vj cv'f qgu'pqv'mug'y'j g"go qvqpu'k'v'y'j g

r ctvkr cpvau'uvqtkgu'd{ 'f kuugevki 'vj go '\*D3pkuj /Dtgf plej . 'r 032."423: +0Qwt"cpcn{ uku'go r j cuk gu  
kpwkxg'y kuf qo u'y j kg'go r mq{ kpi 'tgugctej "eqpxgpvkp y j gp"cr r tqr tkvg0

Vj g'f cv'y cu'cuuguugf "wukpi "c'ugtkgu'qh's wrkcvkxg s wgunkqpu'vj cv'eqpukf gt'vj g'go qvkpu  
cpf "ugpvkpeg"dgj kpf "vj g'uvdo kvgf 'r j qvqi tcr j u.'xkf gqu. cpf "cvf kq'tgeqtf kpi u0S wgunkqpu'vj cv  
i vkf g'qwt "f cv'cpcn{ uku'kpenwf g<y j cv'v{ r g'qh'y kf cpko cn'ku'uj qy p'AY j cv'ku'vj g'eqpvz v'qh'vj g  
r j qvq'AY j cv'f qgu'vj g'eqo r qukkqp'qh'vj g'r j qvqi tcr j uc{ "cdqw'vj g'tgrvkqpuj kr "dgwy ggp'vj g  
r gtuqp"cpf "vj g'cpko cn'AY j cv'ecr vkpu'cpf "uvqtkgu'ctg kpenwf gf AY j cv'go qvkpu'f'vj g

K'ku'etwekrlhqt'j wo cpu'v'eqppgev'v'pqp/j wo cp'ugpv'egp'dgkpi u'kp'qtf gt'v'g'eqi pl' g'qwt  
eqo o qp'r'ncg'qp'Gct'v'OWpf gtuxcpf kpi 'j wo cp'tgrv'kqpuj kr u'y kj 'qyj gt'ugpv'egp'dgkpi u'ecp'cmty  
d'v'w'f'nd'x'g'j' qy 'y g'ecp'dgwt'uj ctg'qwt'r'ncpgvcpf 'r tqv'ev'r tgek'qwu'ur geku'OVj gug  
tgrv'kqpuj kr u.'d'v'k'v'qp'ugpv'egp'k'p'vgtcev'k'pu.'ctg ng{ 'v'j g'go r cvj g'v'v't'g'cwo gpv'qh'y k'f'rhg'cpf  
uwx'k'cn'qh'dk'f'k'x'gt'uk'v' 'qp'qwt'r'ncpg'OV'wt't'gugctej k'p'v'p'f' u'v'k'p'v'k'v'c'p'go q'v'k'p'cn'r' r tqcej 'v'  
eqp'uk'f' g'v'c'v'k'pu'qh'k'p'v'gt'ur geku'k'p'v'gtcev'k'pu'cpf 'ect'g'v'c'k'p'v' qh'qwt'p'c'w't'cn'y q't'f'OV'k'p'eq'p'f'w'v'k'p'i 'v' ku  
t'gugctej . 'y g'j' q'r' g'v'q'r' t'q'f'w'eg'o g'c'p'k'p'i h'w'i'q'w'eqo gu'v'j' c'v'd'g'p'g'h'k'v'j' g'r' c't'v'ek'r' c'p'w.' 'v'j' g't'gugctej' gtu.  
cp'f' 'y' k'f' r'h'g'OV'j' t'q'w'i' j' 'v'j' k'u'w'w'f' { . 'y' g'c'k'o 'v'q' 'i' c'k'p' 'c' d'g'w'g't' 'w'p'f' g't'ux'c'p'f' k'p'i 'q'h'v'j' g'y' c' { u'j' wo cp  
h'g'g'k'p'i u'c'd'q'w'c'p'k'o c'n'k'p'v'gtcev'k'pu'k'p'c' 'e'q'o o w'p'k'v' u'g'w'k'p'i OC'v'k'p'i 'r' c't'v'ek'r' c'p'w'v'q' 'g'z'r' m't'g  
r' g't'ur' g'v'k'g'u'q'p' 'eq'p'ug't'x'c'v'k'p'OV'j' g'c'nu'q' 'y' c'p'v'v'q' 'h'q'v'g't' o g'c'p'k'p'i h'w'i't'g'h'g'v'k'p'u'c'd'q'w'v'j' g'go q'v'k'p'cn  
g'z'r' g't'g'p'egu'k'p'j' wo cp/c'p'k'o c'n'k'p'v'gtcev'k'pu'k'p'c' 'e'q'o o w'p'k'v' u'g'w'k'p'i OC'v'k'p'i 'r' c't'v'ek'r' c'p'w'v'q' 'g'z'r' m't'g  
} g'f' f'g' v' \$##

À Æ, Å Æ c. Å Æ b m, d b, e d b n Æ c. Å Æ b c q d m, Å Æ Æ o d Å, d b

C'v'k'p'i' j' c'v'k'p'i' Æ o' g'p'i' d'v'j' j' Å' j'o' Æ v'Å'w'v'k'p'i' g'w'c'i' Æ c'v'k'p'i'







O gfk'V{r g	
Rj qvq	39
Xlf gq	5
P qpg	3
Eqmgi g'Cwgpfgf	
Dquqp'Eqmgi g	35
Qvj gt	6

**Trends**

**Trend 1: Key words about animal sentience**

Dgecwug'uwwf lgu'kp'vj ku'ctgc'qh'tgugctej 'j cxg'kpxgunki cvgf j wo cp'cempqy ngf i go gpv'qh cpko cnl'ugpvkpeg.'c'ej qugp'vj go g'ht'cpcn'uku'y cu vj g'wug'qh'vj g'y qtf 'ugpvkpeg'qt'c'tgrvfg cempqy ngf i go gpv'qh'pqp/j wo cp'cpko cnl'go qvqp'y kj kp vj g'f'guetkdgf 'kpvgtcevkp0Hqwtvggp.'qt 85085' . 'qh'vj g'r ctvkr cpw'eqo o gpvfg 'qp'vj g'r gtekgxf go qvqpu'qh'vj g'cpko cnl'qt'cpko cni'vj g{ gpeqwpvgtgf 0Vj g'uwwf { 'y cu'cm quv'gpvkn' 'eqo r qugf qh'hgo cmg'j wo cp'r ctvkr cpw'y j kej 'o c{ eqttgrv'q'vj g'o clqtk' 'qh'r ctvkr cpw'o cnl'pi 'ugpvkpeg/tgrvfg eqo o gpw0Eqtpkuj 'cpf eqmgi wgu'hqwpf 'vj cv'hgo cmg'y gtg'o qtg'rkng' 'q' gpi ci g'go qvqpcn' 'y kj 'pqp/j wo cp'cpko cni \*Eqtpkuj 'gv'cn0'423: +0J qy gxgt.'pq'r ctvkr cpw'gzr rkn' wugf 'vj g'y qtf 'ugpvkpeg'kp'vj gkt pcttcvkg0Vj gtghqtg.'eqo o gpw'qp'cpf 'tgrvfg 'q'r gtekgxf go qvqp'cpf 'ur kkwcnl'pvtur gelgu eqppgevkp'y gtg'eqpukf gtgf 'wpgt'vj g'vj go g'qh'ugpvkpeg0

**Trend 2: Key words about human emotional experience**

Vj tgg'qh'vj g'44'r ctvkr cpw'\*35085' +y j q'ngw'pcttcvkg r quw'tgr qtvgf 'hggkpi 'go r cvj { hqt'cpqt#

j wo cp'lpvgtcevkqpu'y kj 'y kf rkhg'cpko cnu'cpf 'yj gk'j cdkcwoVj gtg'y gtg'ugxgtenr ctvlekr cpwu'y j q  
kpf kecvgf 'yj cv'y g{ 'hgn'cr r tgj gpukxg'qt'hgcthwi'cdqww yj gk'lpvgtcevkqpu'y kj 'y kf 'cpko cnu'Vj tgg  
r ctvlekr cpwu'qh'y g'44'vqcnlkpf kecvgf 'yj cv'y g{ 'hgn'pgtxqwu'qt'hgcthwi'ctqwpf 'cpko cnu'dw'y q'qh  
yj g'y tgg'tgr qtvgf 'wmo cvgn' 'j cxkpi 'r qukkxg'hggnkpi u cdqw'yj g'lpvgtcevkqpu0

### ***Trend 3: Transformative effect of experience***

Dgecwug'r tgxkqwu'uwwf lgu'uwi i guvgf 'yj cv'r gtuqpcn'gZR gtlgpegu y kj 'y kf rkhg'j cxg'yj g  
r qy gt'vq'ej cpi g'j wo cpu'r gtur gevkgu'cpf 'cevkqpu'vqy ctf qyj gt'ur gekgu.'yj g'tgugctej gtu  
kpxguki cvgf 'yj g'v'cpuhqto cvkxg'pcwtg'qh'yj g'r ctvlekr cpwu) gZR gtlgpegu'\*Nctuqp'g'v'cn0'4238=  
F qrd{ . '4242='Ueqw'g'v'cn0'4242-0'Qh'yj g'44'f guetkr vkg pcttcvkgu. ': 'r ctvlekr cpwu\*5808' +  
gZR rlekn{ 'f guetkdgf 'c'v'cpuhqto cvkxg'ghgevtqo yj gk'gZR gtlgpeg'y kj 'y kf rkhg.'9'r ctvlekr cpwu  
\*530: ' +lpenmf gf 'pq'tghgtgpeg'vq'c'v'cpuhqto cvkxg'ghgevtqo'v'gk'gZR gtlgpeg.'cpf 'yj g'tgo clkpi  
9'r ctvlekr cpwu\*530: ' +lpenmf gf 'ko r rlekn'tghgtgpegu vq'yj g'gZR gtlgpegu'eqpvtkdwkq'vq'yj gk'pgy  
r gtur gevkg0Ukz'qh'yj g'gki j v'v'cpuhqto cvkxg'gZR gtlgpegu kpxqkxgf 'c'j wo cpw'lpvgtcevkq'p'y kj 'c  
ur gekgu'yj g'r ctvlekr cpv'f qgu'pqv'ugg'qt'lpvgtcev'y kj qp'c'tgi wxt'dcuku0Cu'yj ku'tgugctej 'y cu  
eqpf wevgf 'lp'yj g'o kf uv'qh'yj g'EQXKF/3; 'r cpf go le.'vy q qh'yj g'gZR rlekn{ 'v'cpuhqto cvkxg  
gZR gtlgpegu'lpenmf g'tghgtgpegu'vq'yj g'ko r qtvcpeg'qh'eqppgevkq'p'y kj 'qyj gt'ur gekgu'f wtkpi 'yj ku  
r gtlqf 'qh'kuqrcvkq0'Hkxg'qh'yj g'gki j v'v'cpuhqto cvkxg gZR gtlgpegu'lpenmf gf 'gZR rlekn'tghgtgpegu'vq  
r gtuqpcn'cevkq'vqy ctf 'eqpugtxcvkq0Qpg'v'cpuhqto cvkxg gZR gtlgpeg'j gir gf 'c'r ctvlekr cpv'hgn  
r gtuqpcn{ 'eqppgevgf 'vq'y kf rkhg0'Vj gtg'y cu'cp'qxgty j gm kpi vtgpf 'lp'r ctvlekr cpwu'gZR gtlgpegu  
ecwulpi 'tghgevkq'qp'o wnkur gekgu'eqgzkvgepg0'Qh'yj g'eqo dkgf '37'gZR rlekn{ 'cpf 'ko r rlekn{  
v'cpuhqto cvkxg'gZR gtlgpegu.'; 'lpenmf gf 'c'tghgevkq qp'eqgzkvgepg'cpf 'yj g'gh

Vj g'9'r ctvkr cpw'y j q'f kf "pqvtgr qtv'qp"vj g'tcpuhqto cvkxg'pcwtg'qh'vj gk'y kf rkhg'g'zr gtlkpegu  
uj qy gf 'hgy 'eqo o qpcrkkgu0"Vj g'ur gekgu'gpeqwpvgtgf cpf 'mcecvkpu'qh'vj gug'pcttcvkxgu'y gtg  
xctkgf 0Qpg'r ctvkr cpv'r qpf gtu'y j { 'c'upcr r kpi 'wtvrg tgwtpu'v'vj gk' { ctf "qp'cp'cppwcn'dcuku0  
ōJ gtgā'o { 'vj qwi j v'ō c { dg'uj g'ej qqugu'qwt'my p'dgecwug y g'j cxg'vj g'qpn' 'pcwtcn'hy p'kp'vj g  
pgki j dqtj qqf #AP q'htvkr gt0P q'r guvkrf gu0P q'cp { vj kpi ō Cpqvj gt'r ctvkr cpv'tgo ctngf "qp'c  
ugcnu'cdkrk' { 'v'eqgzku'y kj 'j wo cpu'kp'Nc' Lqmc<ō'Kuy co 'kp'vj g'y cvgt'cpf 'y cu'j qpgun'  
uwr tkugf 'd { 'vj g'ugcnu'rcni'qh'j quvkrk' { 'cpf 'uggo kpi n' f lutgi ctf 'hqt'j wo cpu'uy ko o kpi 'kp'wej  
enug'r tqzko kv.ō0"Vj g'r ctvkr cpw'ctg'cdng'v'cempqy ngf i g cpf 'tghge'v'qp'vj gk'g'zr gtlkpegu'y kj  
qvj gt'ur gekgu.'dw'f q'pqvtgr qtv'cp { 'gxkf gpeg'qh'c ej cpi gf 'cvkwf g'qt'r gtur gev'kxg'hqmy kpi 'vj g  
kpgtcev'kp05"qh'vj g'9'r ctvkr cpw'vj cv'f kf "pqvtgo ctmi'qp'tcpuhqto cvkqp'ctg'uwf gpw'qh  
Gpxkqpo gpv'cn'Uwf kgu0

**Trend 4: Species Type**

Qh'vj g'44'f guetkr v'kxg'pcttcvkxgu.'35'r quu'7; Ō; ' +hgewugf "qp'cp'kpgtcev'kp'y kj 'c  
vj tgcwpgf "qt'tctg'ur gekgu'vj cv'vj g'r ctvkr cpv'f qgu pqv'eqo o qpn' 'gpeqwpvgt'kp'vj gk'gxgt { f c {  
rkhg0Vj gug'ur gekgu'kpen'f gf 'c'ugc'rkqp.'j wo r dcemy j crgu.'dgctu.'cp'gm'c'f ggt.'ugc'wtvrgu.'dkuqp.  
o qwpv'kp'i qcvu.'c'vgtter kp.'ugcnu.'uy cpu.'cpf 'c'wtvrg { 0Qh'vj gug'35'r quu'hgcwtkpi 'kpgtcev'kpu  
y kj 'tctg'cpko cnu.'8'r quu'68Ō7' -'cnu'g'zr r'ekm' f guetkdgf "c'tcpuhqto cvkxg'ghge'v'qp'vj g  
r ctvkr cpv'tqo 'vj g'gpeqwpvgt0Qpg'r ctvkr cpv'uckf vj gk'kpgtcev'kp'y kj 'c'ugc'rkqp'tgchko gf  
vj gk'o qv'xev'kp'v'r tqv'ev'y kf rkhg'cpf 'hgcxg'cpko cnu crpg'ōv'f q'vj gk'vj kpi ō Cpqvj gt  
r ctvkr cpv'y cu'tgo kpf gf "qh'vj g'ko r qv'cpeg'qh'eqpugt'xcv'kp cpf 'vj g'eqgzku'v'peg'qh'j wo cpu'cpf  
pqpj wo cp'cpko cnu'chgt'vj gk'kpgtcev'kp'y kj 'uy cpu0O qtgqxt.'y q'r ctvkr cpw'vj cv'y tqv  
cdqw'vj gk'kpgtcev'kpu'y kj 'j wo r dcen'y j crgu'f guetkdgf vj g'gpeqwpvgtu'cu'o cni'kpi 'vj go 'tghge'v  
qp'vj g'j wo cp'ko r cev'qp'vj g'gpxkqpo gpv'cpf 'vj g'etvgn'v'gco gpv'qh'y j crgu'kp'ecr v'kxk'.'cpf

f guetkdgf 'hggrkpi 'kpur ktgf 'v'eqpvkpwg'yj gk'eqpugtxcvkqp'ghqtu0Qh'yj g'; 'r quu'hgcwtkpi  
kpvgtcevkqpu'y kj 'o qtg'eqo o qp'cpko cnu.'4'r quu'\*4404' +cnuq'f guetkdgf 'c'tcpuhqto cvkxg'ghgev  
qp'yj g'r ctvlek cpv'htqo 'yj g'gpeqwpvgt0Vj wa.'pcttcvkxgu cdqw'gpeqwpvgtu'y kj 'tctg'cpko cnu'y gtg  
409'ko gu'o qtg'rkgnf 'v'f kuewu'c'tcpuhqto cvkxg ko r cev'yj cp'gpeqwpvgtu'y kj 'eqo o qp'cpko cnu0  
c0 35'qh'yj g'44'r quu'\*7; 0; ' +cnuq'kpenf gf 'c'tghgevkkp qp'eqgzkvgep.'yj g'j wo cp'ko r cev  
qp'yj g'uwtxkcn'qh'yj g'ur gekgu.'cpf lqt'yj g'ghgevqh'j wo cp'qt'pqpj wo cp'cpko cnu'r tgugpeg  
cu'c'r quukdr'f kuwtdcepeg'v'yj g'qyj gt0Qh'yj g'6'r quu yj cv'hqewugf 'qp'eqgzkvgep.'cml'qwt  
\*322' +y gtg'eqppgevgf 'v'kpvgtcevkqpu'y kj 'tctg'cpko cnu0k'qp'g'r quv'cdqw'o qwpvckp  
i qcu.'yj g'r ctvlek cpv'uj ctgf 'yj cv'yj g'gizr g'kgep o cf g'yj go 'otgcrk' g'yj cv'j wo cp'dgkpi u  
eqgzkv'y kj 'cpko cnu'cu'y g'uj ctg'yj g'uco g'gctvj 'y kj yj go 0'k'cpqyj gt'r quv.'c'r ctvlek cpv  
yj cv'kpvgtcevgf 'y kj 'dkuqp'gizr m'kpgf 'yj cv'yj g'gpeqwpvgt o cf g'yj go '0vj kpm'yj cv'eqgzkvgep  
y kj 'cpko cnu'ku'r quukdr'0'Qh'yj g'8'r quu'yj cv'f gcnv y kj 'yj g'j wo cp'ko r cev'qp'pqpj wo cp  
cpko cnu.'5'qh'yj g'8'\*72' +r quu'y gtg'eqppgevgf 'v' tctg'ur gekgu0Qpg'r quv'cdqw'ugc'wt vgu  
tgo kpf gf 'c'r ctvlek cpv'cdqw'0vj g'ko r cev'yj cv'j wo cp

cpko cnu'uj ctkpi "c'ur ceg0J qy gxgt."qh'vj g'35'r quw'vj cv'tghngevgf "qp'vj gug'vqr keu'cu'y gmi'cu  
eqgz kugpeg.", 'r quw'8604: ' +y gtg'htqo 'kpgtcevqpu y kj 'tctg'cpko cnu0

**Trend 5: Composition of Photograph**

J qy 'f kf 'r tqzko kv 'chgev'j qy 'vj g{'hgn'cdqw'vj g'cpko cnaF kf 'k'gxqmg'tgur gev.'hgctA

c0 Y qqf r gengt<õJ g'f kf pø'uggo "vq'o kpf "o g'uvcpf kpi 'uq enqug.'s wkw' 'o guo gtl gf "y j kg

y cvej kpi 'j ko 'j cr r k' 'y qqf dqt kpi "cy c{=j g'uggo gf 'tcvj gt r tqwf "vq'uj qy 'qhh'j ku

r qy gt/r genkpi "cdk'kgu0K'gn'vj cv'vj ku'y qqf r gengt cewcm' 'hngf 'vj g'cwf kgpeg.'uq"K

hqmy gf 'j ko "cpf 'hko gf 'j ko "y j kg'pco kpi 'j ko "Y cngtõ

cemcãfã cbio cird  
d0 Gm'õkj g'nu'uj puqv'f kgev'g'zr g'ej kpi 'j ko 'j cr r k' 'y cewcg0

- k0 ðVj g'o quv'tgo ctædrg'gZR gtlgpeg'y cu'y kj 'c'i tqwr 'qh'y j crgu'y j lej 'eqo g  
 vj tqwi j 'qwt'y cvgtu'kp'O ctej 'cpf 'Cr tkn'gcej '{ gct0Uggkpi vj gug'j vi g'cpko cnu  
 tgcml 'r wu'j qy 'uo cm'y g'ctg'kpva'r gtur gevkgö
- k0 ðVj gtg'y g'f tkhgf 'y j kg'dgkpi 'uwtqwpf gf 'd{ 'J wo r dcemu hqt 'yj tgg'j qwtuö
- g0 UgcndöCv'j ku'eqxg'qp'vj g'y cvgt.'o cp{ 'ugcni'i cvj gtgf ctqwpf 'v'uwpcvj g0Kuy co 'kp'vj g  
 y cvgt'cpf 'y cu'j qpguwl 'uwr tkugf 'd{ 'yj g'ugcnu'æremqh'j quv'kv' 'cpf 'uggo kpi n' 'f kutgi ctf  
 hqt'j wo cpu'uy ko o kpi 'kp'uwej 'emug'r tqzko kv'0Vj g'ugcnu y gtg'uwpcvj kpi . 'uy ko o kpi .  
 erko dlpi 'qp'vj g'tqemu.'gplq{ kpi 'yj g'uwpcvj . 'gei ' 'Ky cu ucpf kpi 'uwr gt'emug'v'v' q'ugcnu  
 y j q'uggo gf 'v'i gv'kp'cp'cti wo gpv'y kj 'gcej 'qvj gt '{ gvf kf 'pqv'gxgp'dcv'cp'g{ g'cv'o g0  
 Rtgw{ 'pgcv'j qy 'ceewuqo gf 'cpko cni'ecp'i gv'v'dgkpi pgct'j wo cpuö
- h0 Dwpp{ <ðK'y cupø'o qxkpi 'cv'cm'gxgp'y j gp'Keco g'emug v'k' 'cpf 'k'y cupø'drkpnkpi lka  
 g{ g'y cupø'o qxkpi 0Kdgi cp'v'i gv'y qttkgf 'cpf 'eqpukf gt vj g'r quukdkkv' 'vj cv'vj g'dwpp{ 'y cu  
 htq| gp'v'f gcvj . 'y j lej 'uectgf 'o g'cpf 'o cf g'o g'hggnuq'uqtt{ 'hqt'k0Ky qwr 'pqv'eqpukf gt  
 o { ugrh'cp'cpko cni'qxtg'd{ 'cp{ 'o gcpu.'cpf 'pqto cm' co 'o qtg'chtckf 'v'i gv'emug'v'cp{  
 y kf 'cpko cni'0Rgtj cr u'vj g'hcev'vj cv'vj ku'dwpp{ 'y cu uq'f ghpugruu'ku'y j cv'o cf g'o g'pqv  
 hgn'vj tgcvgpgf 'd{ 'k'dw'tcvj gt'vj kpnkpi 'qh'y c{ u v'v' 'v'j'j gr 'k0
- i 0 F ggt<ðKmqmgf 'qwukf g'vj g'y kpf qy 'qh'o { 'j qwug'cpf ucy 'c'f ggt'uuctkpi 'cv'o g'cpf  
 uqo r kpi 0K'y cu'c'tgcm' 'co c| kpi 'gZR gtlgpeg'v'ugg vj g'f ggt'tgeqi pk g'cpf 'kpvgtcev'y kj  
 o g0
- j 0 Dkuqp<ðQp'o { 'y c{ 'yj gtg.'Kuvqr r gf 'o { 'ect'v'vcng c'mqm'cv'vj ku'i tqwr 'qh'dkuqp0K  
 y cvej gf 'vj go 'hqt'c'y j kg.'cpf 'gplq{ gf 'dgkpi 'kp'vj gk r t gugpeg0Vj g{ 'f kf pø'uggo 'v'  
 pqv'eg'o g'cpf 'y gpv'cdqw'vj gk'f c{ 'i tcl kpi 'cpf 'y cm'kpi ctqwpf 0



10 I qcvu<ōKi qv'c'dk'pgrxqwu'cu'vj g{ 'eco g'emug'v'w'u'v'etquu'vj g'r cvj 0Vj g{ 'f'k' 'pqv'uggo vq'o kpf 'vj g'fcev'vj cv'vj gtg'y gtg'r gqr rg'cni'cmipi 'vj g'r cvj . 'cu'qpi 'cu'y g'f'k' 'pqv'i gv'vqq enqugō

10 Ugc'Nkqp<ōQp'qpg'gZR gf kkp'y g'gpeqwpvgtgf 'c'ugc nkqp'ur tcy rpf 'qp'c'dgpej 'tgukpi 0K uc'vqp'vj g'dgpej 'qr r qukg.'cdqw'8'hggv'cy c{0K'rqmgf wr . 'k'gp'k'kf'o g'cu'c'pqp/vj tgc v cpf 'y gpv'dcem'v'unggr 0K'eqwf pō'j grr 'dw'pq'v'eg c'r gtuqpcrk' 'v'j ko . 'h'ng'j' qy '{ qw'h'ggn y j gp' '{ qw'g'p'cr r kpi 'qp'vj g'eqwej 'cpf 'uqo gqpg'y cmu k'p'uq' '{ qw'rqm'vr 'dgh'gt'g'i two r kfi i q'dcem'v'upqql kpi ō

67067' 'qh'r quu'tghgtgpegf 'j wo cp'r tqzko k' 'v'q'y k'f'nhg ur geku0Ugxgtcn'qh'vj gug'r quu hgcw'gf 'cp'cur gev'qh'tgur gev'k'p'vj gk'o gp'v'k'pu'qhr tqzko k'0Vj k'k'p'w'p'uj qy u'gx'kf' gpeg'qh eqgz'k'v'peg'k'p'vj gug'y k'f'nhg'k'p'v'gt'cev'k'pu'='vj cv'ku. r gqr rg'cpf 'cpko cni'uj ct'kpi 'c'ur ceg'r gcegh'wm{0 Oqtg'x'gt. 'vj k'uj qy u'r qu'k'x'g'uki pu'qh'c'y k'k'pi p'guu k'p'vj g'h'w'w'g'v'q'eqgz'k'v'y k'j 'cpko cni'0Vj k'ku c'ng{ 'h'p'f'k'pi 'qh'q'w't'gug'ctej . 'cpf 'ku'c'x'gt{ 'r qu'k'x'g' k'p'f'k'c'v'k'p'vj cv'k'p'v'gt'cev'k'pu'y k'j 'y k'f'nhg'o c{ eqp't'k'd'w'g'v'q'eqp'ug't'x'c'v'k'p'qh'd'k'q'f'k'x'gt'uk'0

## Discussion

### *Trends in Keywords about Sentience*

Vj g'vj go g'qh'ugp'v'k'peg'cpf 't'gr'v'gf 'ng{y qtf u'y gtg'x'gt{ r t'gug'p'v'k'p'vj g'f'c'w'vj cv'y cu eqm'gev'gf 0K'p'ug'cf 'qh'c'uni'k'pi 'ur gek'k'ecm' 'cdqw'w'p'f'gt'ur'cpf k'pi cpf 'r'g't'egr'v'k'p'qh'c'pko cni'ugp'v'k'peg. qr gp's w'g'v'k'pu'y gtg'r qu'gf 'v'c'm'qy 'r'ct'v'ek'cp'u't'q'qo v'q'uj ctg'r g'tur gev'x'gu'cpf 'g'zr'gt'k'pegu h'ggn{0E'q't'p'k'uj 'cpf 'eqm'g'ci w'gu'r w'd'k'uj gf 'ko r q't'c'p'v't'g'u'w'w'k'w'o k'p'c'v'k'pi 'vj g'f'go qi t'cr'j'k'e't'g'p'f'u k'p'r'g'tur'gev'x'gu'qp'cpko cni'ugp'v'k'peg'd{ 'u'w'x'g'f'k'pi 'c'eqm'gev'k'p'qh'r'ct'v'ek'cp'u'y k'j 'ur gek'k'e s'w'g'v'k'pu'qp'cpko cni'ugp'v'k'peg' \*E'q't'p'k'uj 'g'v'c'ni'0'423: +0Vj g't'g'u'w'w'qh'vj k'u't'gug'ctej 'd'w'k'f' 'w'r'qp'vj qug

hpf lpi u'd { 'kmwo kpcvpi 'vj g'xgt dci g'wugf 'vq'f guetkdg'pqp/j wo cp'cpko cni'go qvqpu'cpf 'ugpvkpeg  
cpf 'tghphqteki 'vj gk'tguwuu'tgi ctf lpi 'c'eqttgrvqp dgy ggp'hgo cngu'cpf 'go qvqpcr'eqppgevkp  
y kj 'pqp/j wo cp'cpko cni'Eqtpkj 'gv'cni'423: -0Hqwtvgg qh'vj g'y gpv{/wy q'r ctvkr cpw'y tqvg  
cdqw'vj g'r gtegxgf 'go qvqpu'qh'vj g'cpko cni'kp'uqo g ecr cekv{ 'kpf lecvpi 'cp'cempqy rgi go gpv'qh  
pqp/j wo cp'cpko cni'ugpvkpeg0k'qvj gt'y qtf u.'o qtg'vj cp j cni'qh'vj g'r ctvkr cpw'kpenmf gf  
eqo o gpw'tgrvpi 'vq'cpko cni'ugpvkpeg'y j gp'cungf 'vq uj ctg'c'pcttcvkg'cdqw'c'y kf rkhg  
kpvgtcevqp0vj gug'r gtegxgf 'go qvqpu'tcpi gf 'öecro ö vq'öci i tguukxgö'cpf 'vj g'r quw'kpenmf gf  
y qtf u'wej 'cu'gzekgf . 'tgrczgf . 'htwutcvgf . 'wpr j cugf . eqpvgr0Qh'vj g'r quw'vj cv'kpenmf gf 'vj gug  
ng{y qtf u'cpf 'ugpvko gpw.'vj g'ur gekgu'qh'vj g'cpko cntcpi gf 'htqo 'mqecn'dcem{ ctf 'dglpi u'vq  
kpvgtcvkpcn'tctg'ur gekgu'kpf lecvpi 'vj cv'ur gekgu rkngr{ 'j cf 'pq'ko r cev'qp'y j gjv gt'qt'pqv'vj g  
r ctvkr cpv'kpenmf gf 'eqo o gpw'qp'ugpvkpeg0O cp{ 'qh'vj g'ur gekgu'ctg'hqwpf 'kp'vj g'Wpkgf 'Ucvgu  
dw'mqecvqpu'cni'kpenmf gf 'Uy kj gtrpf . 'Dgto wf c. Dtc| kn'cpf 'vj g'I cnr ci qu0P qpg'qh'vj g  
r ctvkr cpw.'j qy gxgt.'wugf 'vj g'y qtf 'ugpvkpeg'kpf lecvpi 'vj cv'r gtj cr u'vj g{ 'gZR gtlkpeg'cpko cn  
ugpvkpeg'y kj qw'j cxkpi 'rgctpgf 'cdqw'vj g'hqto cneqpegr 0F qnd{ 'cti wgu'hqt'vj g'gZR cpukp'qh  
gpvktqpo gpvni'gf wecvkq'ur gekk'ecm{ 'tgrcvgf 'vq'go r cvj { cpf 'cpko cni'ugpvkpeg'y j kej 'y g'cni'q  
tgeqo o gpf 'cu'o cp{ 'r ctvkr cpw'y gtg'pqv'cu'y gmlphqto gf qp'eqpugtxcvq'cpf 'vj g'go gti lpi  
rkvgtcwtg'qp'ugpvkpeg'0F qnd{ 'gv'cni'4242-0Gf wecvkq'ur gekk'le'vq'vj ku'vqr le'dglpi 'i kxgp'r tkqt'vq  
eqpf wevpi 'c'uwf { 'uwej 'cu'vj ku'o c { 'j cxg'ko r rdevkqpu qp'tguwuu'cpf 'vgtö kqmqi { 'wugf 0

**Trends in human emotion**

Vj g'f cv'eqngevgf 'uj qy u'vj cv'j wo cpu'gZR gtlkpeg'c dtqcf 'tcpi g'qh'go qvqpu'y j gp  
kpvgtcevpi 'y kj 'vj g'rkv'gu'cpf 'ugpvkpv'ur kksu'qhy kf rkhg'cpko cni'0Y j gp'r ctvkr cpw'tgr qtvgf  
hgrkpi u'qh'go r cvj { 'hqt'pqp/j wo cp'cpko cni'vj g{ 'hgrvy gtg'utwi i rki 'kp'uqo g'y c{.'vj g{  
o gpv'kpgf 'j qy 'vj g'cpko cni'utwi i ng'o cf g'vj go 'vj kpmetk'ecm{ 'cdqw'j wo cp'cpf 'pqp/j wo cp

cpko cnlkpvtcevkqpu'cpf lqt'eqpugtxcvkqp0Vj ku'kpf kpi 'tghgeu'vj g'y qtm'qh'\*Y cmcej 'g'v'c'0'423: +  
k'p'y j lej 'y g'cwj qtu'ucv'vj cv'uwo o qpkpi "eqo r cuukqp ku'ko r qtcv'v'y j gp'y kpnkpi "etk'k'ecm' "cpf  
g'y kec' "cdqw'eqpugtxcvkqp0K'vgt'gukpi n' . 'y g'eqo r cuukqp ug'xgt'cn'qh'vj g'r ct'v'ekr cp'u'h'gr  
k'pxqmgf 'c'ugpug'qh'f w'f 'v'q'eqpugt'xg'vj g'rk'x'gu'cpf y gm'dgkpi "qh'y k'f r'k'g'cpko cu'0'Vj g'o clqtk'f' "qh  
r ct'v'ekr cp'u'g'zr t'guugf 'r qukk'x'g'h'g'g'kpi u'k'p'vj g'k' p'ctt'c'v'x'gu't'geq'w'v'kpi 'y g'k'g'zr g't'k'g'pegu'y k'j  
y k'f r'k'g'cpko cu'0'Vj ku't'g'p'f 'ku'g'z'ek'kpi "dw'p'q'v'p'ge'gu'ct'k'f' u'w'r t'k'k'pi 0'0 q't'g'q'x'g't.'u'w'ej 'k'p'f' k'pi u  
c'h'k'to 'y cv'ek'k' g'p'ue'k'peg'f' t'q'w' u'r t'q'x'k'f' g'go q'v'x'g' g'zr g't'k'g'pegu'y t'q'w' j 'g'f' w'ec'v'kpi 'r ct'v'ekr cp'u'q'p  
ko r q't'c'v'p'g'p'x'k'q'po g'p'w'c'n'v'q'r leu'\*R'c'g'eq'g'v'c'f'0'4243+0

*Trends in Transformative Narratives*

Vj g't'gu'w'u'h'q'w'p'f 'k'p'vj ku'uw'f { 'ct'g'eq'p'uk'v'g'p'v'y k'j r t'g'x'k'q'w'u'uw'f { a'k'p'f' k'pi u'vj cv  
g'zr g't'k'g'pegu'y k'j 'y k'f r'k'g'j' c'x'g'vj g'c'd'k'k'f' "v'q'o q'v'x'c'v'g' j wo cp'c'ev'q'tu'v'q'y c't'f' "go r cv'j g'v'k'c'ev'k'q'pu  
v'q'y c't'f' 'y k'f r'k'g'c'p'f "c'h'g'ev'x'g'c'p'f "go q'v'k'p'c'n't'g'ur q'p'ugu v'q'y k'f r'k'g'u'v'ko w'k'\*N'c'tu'q'p'g'v'c'f'0'4238=  
F'q'nd'f' . "42420N'c'tu'q'p'c'p'f "eq'm'g'c'i' w'g'u'h'q'w'p'f 'y cv'g'zr g't'k'g'pegu'y k'j 'j' q'w'ug'ur c't't'q'y u'r qukk'x'g'n'f'  
c'h'g'ev'g'f' 'r ct'v'ekr cp'u'v't'g'c'w' g'p'v'q'h'vj g'ur g'el'g'u' . 'y j lej ku'uw'r r q't'v'g'f' 'd' { 'y g'q'x'g't'y j g'm' k'pi 'r q't'v'k'p  
q'h'g'zr g't'k'g'pegu'y cv'q'w't'uw'f { 'h'q'w'p'f 'v'q'd'g'r ct'v'ek'w'c't'n'f' v't'c'p'uh'q'to c'v'x'g'0'F'q'nd'f' { 'h'q'w'p'f 'y cv'y t'k'k'pi  
cp'g'u'uc' { 'h't'q'o 'y g'r g't'ur g'ev'x'g'q'h'c'p'cp'ko c'n'vj g'f' 'j' c'f' r t'g'x'k'q'w'u'f' "q'd'ug't'x'g'f' "eq'p't'k'd'w'g'f'  
u'k'i p'k'h'ec'p'v'f' "v'q'vj g'k'g'p'x'k'q'po g'p'w'c'n'g'f' w'ec'v'k'q'p'c'p'f go r cv'j g'v'k'c'ev'k'q'p'v'q'cp'ko cu'0'F'q'nd'f' .  
4242+0Q'w't'uw'f { "eq'p't'k'd'w'g'u'v'q'F'q'nd'f' { a'v'y q't'm'f' { 'u'j' q'y ec'uk'pi 'y g'r q'y g't'q'h'g'zr g't'k'g'p'v'c'n't'g'h'g'ev'k'q'p  
q'p'j' wo cp'a'eq'p'eg'r v'k'q'pu'q'h'c'p'f "eq'p'p'g'ev'k'q'pu'y k'j "q'v'j g't'ur g'el'g'u'0'H'k'g'g'p'q'h'vj g'44'\*8: Ø: ' +  
r ct'v'ekr cp'u'g'k'j g't'ko r r'ek'n'f' "q't'g'zr r'ek'n'f' "t'g'h't't'g'f' v'q'vj g'v't'c'p'uh'q'to c'v'x'g'p'c'w'w'g'q'h'vj g'k't'y k'f r'k'g'  
k'p'v'g't'cevk'q'p' . 'u'w'i i g'uk'pi 'y cv'k'p'et'g'c'ug'f' 'h't'g's'w'g'p'e' { "q'h'j wo cp/y k'f r'k'g'k'p'v'g't'cevk'q'pu'j' cu'vj g'r q'v'g'p'v'c'n'  
v'q'ko r t'q'x'g'v't'g'c'w' g'p'v'q'h'q'v'j g't'ur g'el'g'u'0'"R'ct'v'ekr cp'v'38a'v'c'v'g'o g'p'v'ec'r w't'g'f' 'y g'ug'p'v'ko g'p'v'q'h'  
o cp' { "q'h'vj g'f' t'q'w' a'v'o go d'g't'u'c'v'0'Vj g'f' { 'y g't'g'x'g't' { 'ec'm' c'p'f "ug'go g'f' "s'w'k'g'eq'p'v'g'p'v'lw'v'j' c'p'i k'pi "q'w'

qp'vj g'o qwpvckp0Vj ku'gzr gtlgpeg'o cf g'o g'tgcrk g'vj cv'j wo cp'dgkpi u'eqgzkv'y kj 'cpko cnu'cu'y g  
 uj ctg'vj g'uco g'gctvj 'y kj 'vj go 0K'r ctvkwct.'tghgtgpegu vq'eqgzkv'gpeg'y gtg'j ki j n' r'tgxcrgp0  
 Vj ku'o c{ 'dg'f wg'vq'j wo cp'af qo kpcpeg'lp'vj g'pcwtcny qtrf . 'qhv'p'ngcf kpi 'vq'ugr ctcvkap'qh  
 ur gelgu0'Y j gp'j qo q'ucr kgpu'ctg'gpeqwtci gf 'vq'lpvgtcevy kj 'qvj gt'ur gelgu'lp'vj gkt'v' r'lecn  
 gpv'vj g' ctg'cdng'vq'f geqpwtwv'vj g'f qo kpcpvpwctg/uqekg' 'kf gqni kecnf kxkf g0  
 Cempqy rgi i kpi 'vj g'xcnw'qh'o wnkur gelgu.'cu'lpvtqf weg' d{ 'cwj qtu'Mktmug{ 'cpf  
 J gm tglej \*4232+."lp"qwt'uj ctgf "gpv'ku'c'etwecnuvgr 'vqy ctf u'lwuv'rtugtxcvkqp"\*Mktmug{  
 cpf "J gm tglej .4232+0"Cp"qxgty j gm kpi "o clqtkv' 'qh'vj g'gzr nek'v' 't'cpuhqto cvkxg'gzr gtlgpegu  
 qeewt'gf "dgy ggp'j qo q'ucr kgp'cpf 'c'ur gelgu'vj g' lpvgtcevy kj 'tctgn'0'Vj ku'o c{ 'uwi i guv'vj cv  
 ur gelgu'lpvgtcevkpu'ctg'o qtg'r qy gthw'vj j gp'vj g' "eqv'cuv'v' r'lecn'lpvgtcevkpu0'Hqt'gzco r'ng.  
 Rctv'ekr cpv'4'y tqv'cdqw'vj gkt'gzr gtlgpeg'y kj 'j wo r'dcemy j crgu'0'Vj g'f c{ 'y cu'qpg'Ky km  
 hqtgxgt'tgo go dgt'y kj 'vj g'tcpuegpf gpv'uqwpf u'qh'y j crgu dtgcej kpi 'pgctd{ 'cpf 'vj g'tgcrk' 'qh  
 y j cv'y g'xg'f qpg'vq'vj gug'y cvgtu'ukp'kpi 'lp.0'Vj g' r'ctv'ekr cpv'tgr qtvgf 'vj cv'vj g'gzr gtlgpeg'j cf 'c  
 f'ktgev'lo r'cev'qp'vj gkt'y qtm'cpf 'eqv'tkdwk'vq'vq'eqv'gtxcvkqp kpk'cvk'gu0C'f'f'k'k'q'p'cm{ . 'ej ctkuo cvk  
 gzr gtlgpegu'y kj 'cpko cnu'o c{ 'j cxg'vj g'r'qv'p'v'cn'vq' dg'o qtg't'cpuhqto cvkxg0'Rctv'ekr cpv'33  
 eqppgevgf 'y kj 'c'f'gg'0'K'v'dtqwi j v'o g'emugt'vq'y kf r'kg' cpf 'K'hn'o qtg'eqppgevgf 0K'v'ngcf 'qh'lwuv  
 qdugt'xkpi 'vj ku'cpko cn'ht'qo 'vj g'lp'v'g'g'Ky cu'cewcm{ o cn'kpi 'g'g'eqv'cev'cpf 'dgkpi  
 cempqy rgi i gf "d{ 'vj ku'f'gg'0'J wo cpu'o c{ 'dg'o qtg'eqppgevgf cpf "o q'v'x'cv'g'vq'r'v'q'ge'v'ur gelgu  
 vj cv'gz'j kdk'j wo cp'v'ng'v'g'c'w'w'gu0'Vj g't'gu'w'u'uj qy vj cv'vj gug'lpvgtcevkpu'ctg'lo r'qt'v'p'v'ht  
 kv'qf v'ekpi "o wnkur gelgu'eqppgevk'p'cpf 'ug'v'k'peg0 Vj ku'uwf { 'y cu'ur gel'k'ecm{ 'lpv'gt'g'v'g'f 'lp'vj g  
 gh'gev'qh'vj gug'lpvgtcevkpu'qp'r'gtur ge'v'x'gu'qh'eqv'gtxcvkqp=j qy gxgt. 'qpn{ 'h'x'g'gzr gtlgpegu'j cf 'c  
 f'ktgev'v' r'qu'k'x'g'lo r'cev'qp'vj g'r'ctv'ekr cpv'v'eqv'gtxcvkqp kpk'cvk'gu0'Vj gug't'gu'w'u'uw' i guv'vj cv  
 vj gtg'ku'c'ecw'cn'gh'gev'qh'y kf r'kg'lpvgtcevkpu'qp'j wo cp'v'ur'gtur ge'v'x'gu'qp."go q'v'k'p'u'uj ctgf 'y kj .



tgugtej 'hqt cv'etgcv'cp'k'pvtcevxg'cpf 'o gcpkpi hwi'gZR gkpege'hqt'yj g'r ctvkr cpw. 'k'ecp'dg  
kpetgf kdn' 'tcpuhto cvxg'hqt'yj g'tgugtej gtu'cu'Tlej ctf uqp \*4223+'j ki j rki j w'cpf 'f'kuewugu'cv  
ngpi yj 'kp'j gt'y qtn0Cffkkqpcmf. 'wukpi 'c'pqp/tcpf qo eqpxgpkpege'uco r ng'etgcvf 'c'f'kxgtug  
r ctvkr cpv'dcug0Vj g'r ctvkr cpv'r qqr'ku'eqo r qugf qh'cm'ci gu'qxgt'yj g'ci g'qh'3: . 'dqy 'eqmgi g  
cpf 'pqp/eqmgi g'uwf gpw. 'cpf 'c'o kz'qh'Dquvq'Eqmgi g cpf 'pqp/Dquvq'Eqmgi g'eqo o wpkf  
o go dgtu0J cxkpi 'c'f'kxgtug'i tqw 'qh'r ctvkr cpw'r tqxkf gf c'y kf g'tcpi g'qh'k'pvtg'w'lp'y kf rkg.  
r gtur gevkgu. 'cpf 'gZR gkpege'y kj 'y kf rkg0Wukpi Hcegdqnm'cu'yj g'ej qugp'r r'v'hto 'hqt  
eqpf wvki 'y ku'tgugtej 'cmqy gf 'yj g'r ctvkr cpw v' hqugt'eqppgevkpu'y kj 'gcej 'qy gt'cpf 'yj g  
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r r'v'hto 'r tqxkf gu'c'pgy 'eqv'kdwkp'v'eqo o wpkf dwkf kpi 'k'eqpf wvki 'gy pqi tcr j le.  
pcttcvxg'tgugtej 0Vj g'tgugtej gtu'r qugf 'gf wecvkpcn'xkf gqu'qy ctf u'yj g'gpf 'qh'yj g'f'cv  
eqmgevkp'r tqegu'v'k'p'hto 'yj g'o go dgtu'qh'yj g'i tqw qh'yj g'tgcuqpu'hqt'yj g'tgugtej 'cpf  
gZR r'k'kpi 'hg' { 'eqpegr w'lp'yj g'pqp/j wo cp'cplo cntgugtej ur ceg0Vj ku'cm'pi 'y kj 'yj g'k'p'wukp  
qh'r gtuqpcn'pcttcvxg'ku'lp'yj g'o cpwetr v'cmqy gf 'yj g' tgugtej gtu'v'eq/etgcv'yj kj 'yj g'r ctvkr cpw  
cpf 'gcej 'qy gt'yj tqw j 'yj g'eqv'kdwkp'qh'r gtuqpcncpgef qv'g0Ukwc'kpi 'yj g'tgugtej gtu'yj kj k  
yj g'pcttcvxg'ur ceg'cu'qr r qugf 'v'c'r w'g'qdugtxcv'kpcncpf 't'gkgtcvxg'tqrg'ku'y j cv'o cngu  
pcttcvxg'tgugtej 'cpf 'gy pqi tcr j { 'wps wg'cu'p'qygf d { 'D%pkuj /Dt'gf'plej '\*423: +0Y j cv'ugw'qwt  
uwf { 'cr ctv'ku'yj g'eqv'kdwkp'qh'qwt'x'q'legu'lp'yj g' tgugtej 'ur ceg'v'gf wecv. 'k'p'hwpeg. 'cpf  
go qv'cm'pi ukf g'r ctvkr cpw'lp'v'wg'ugpv'k'p'v'hto 0Vj ku'uwf { 'y cu'rti gn' 'cp'qtki k'p'cntgugtej  
o gy qf 'f'guki p'yj lej 'cmqy gf 'yj g'tgugtej gtu'v'ck'qt yj g'r tqegu'v'ur gek'k'f'gukt'gf 'qweqo gu  
cpf 'ko r necv'kpu'hqt'yj g'tgugtej gtu. 'r ctvkr cpw. cpf 'rti gt'h'gn' 'qh'y kf rkg'tgugtej 0

**Limitations**

Y j kg'vj g'f guki p'qh'vj ku'uwf { 'qhhgtgf 'o cp { 'dgpghku'v'vj g'tgugctej . 'vj gtg'ctg'ugxgten cur gew'vj cv'o c { 'hko k'vj g'cdkxk { 'v'hqto 'f ghpkxkg'cpf 'i gpgtcrk cdrag'eqpenwukpu0'Cnj qwi j gzvpxkg'ghqtu'y gtg'vcngp'v'kpxkg'kpvgtguvgr r ctvlekr cpw'v'vj g'i tqwr . 'vj g'uk' g'qh'vj g'uco r ng y cu'uqo gy j cv'uo cm'y kj 'qpn { '44'qh'64'v'vcl'j wo cp r ctvlekr cpw'uj ctkpi 'vj gk'tgxr gtlkpegu'y kj vj g'i tqwr 0"Vj g'uo cm'uk g'qh'r ctvlekr cpw'cmqy gf hqt'o qtg'gzvpxkg'cpf 'kpenwukg'cpcn { uku'qh pcttckxgu= j qy gxgt. 'vj g'uco r ng' b c { 'pqv'dg'tgr tgugpvcxkg qh'vj g'i tgcvt' j wo cp'r qr wvckpp0 Cffklqpcn { . 'vj g'uco r ng'y cu'qxgty j gm kpi n' 'hgo crg. y kj 'qpn { 'qpg'o crg'r ctvlekr cpw'0"Vj g'xcuv o clqtk { 'qh'r ctvlekr cpw'\*99049' -'ctg'eqmgi g'uwf gpw0Uq. 'vj g'hpf kpi u'o c { 'dg'r tko ctkn { i gpgtcrk cdrag'v' 'hgo crg'eqmgi g'uwf gpw0k'p'ok'penwukgpguu cpf 'F kxgtuk { 'k'Ekk gp'Uelkpeg.ö Rcrgeq'cpf 'eqmgi wgu'utguu'vj g'tqrg'qh'ekkk gp'uclpeg k'r tqf wvckpi 'hpqy rfi g. 'y j kej 'y g.'cu t'gugctej gtu. 'etgcg'vj tqwi j 'qwt'htco kpi 'qh'qwt'pcttckxgu cpf 'vj g'r ctvlekr cpw'y g'kpenw' g'Rcrgeq gv'crl'4243+0k'vj g'r tqegu'qh'qwt'tgugctej . 'qwt i tqwr ' j cu'go dtcegf 'uwlgevxkg'g'zr gtlkpeg= j qy gxgt. 'k'ku'lo r qtvcv'v'v'tgeqi pl g'vj cv'qwt'kf gpv { cu'hgo crg'eqmgi g'uwf gpw'eqv'kdwgf 'v'c' nguu'vj cp'kpenwukg'uco r ng'0Ncuw { . 'vj g'qr gp'gpf gf pcw'g'qh'vj g'r tqo r v'rgf 'v'f khhgtpegu'k' eqv'gpv.'hko k'kpi 'vj g'tgugctej gta'ecr cek { 'hqt'f kgeveqo r ctkuq'qh'r ctvlekr cp'v'g'zr gtlkpegu0

**Implications**

Vj tqwi j qw'qwt'uwf { . 'qwt'k'v'gp'v'k'p'y cu'v'v'hqewu'qp eqppgevkpi 'r gqr ng'ctqwpf 'vj g'kf gc'qh r tqgevkpi 'qwt'uj ctgf 'gpxkqpo gp'0Y g'clo gf 'v'k'pukmcp'go q'v'k'p'cn'cr r tqcej 'v'v'gh'ng'v'k'p'u'qp y k'f r'k'g'k'p'v'gt'cevk'p'u.'cpf 'd { 'uq'f'qkpi . 'uj gf 'hki j vqp'vj g't'gr'v'k'p'uj k' 'dgy ggp'r ctvlekr cpw'ø wpf gtuwcpf kpi 'qh'pqp/j wo cp'c'plo cn'ugp'v'k'peg'cpf 'vj gk' qr k'p'k'p'u'qp'eqpugt'xc'v'k'p'cpf dkqf kxgtuk { 0Dcugf 'qp'qwt'tguwuu. 'k'p'y j kej 'r ctvlekr cpw'tgcf kn { 'uj ctgf 'c'y k'f g'x'ctk'g'v' { 'qh vj qwi j v'w'lpcttckxgu'cdqw'vj gk't'g'zr gtlkpegu'y kj y k'f r'k'g'v'j cv'go dtcegf 'vj gk'go q'v'k'p'u'cpf







eqo o wplv{ 'eqwf 'uwf { 'y j cv'y g'o quv'ghgevxg'y c{ u'ctg'vq'lpetgcug'cpf 'o clpvkp'gpi ci go gpv  
 co qpi 'r ctvkr cpw'y kj 'vj gug'vqr leu0Hwwt g'tgugctej gtu eqwf "gxr mtg'kh'uj ct'kpi 'ctvkr gu.  
 Htgs wgpw{ 'eqo o gpvki 'cpf 'hknpi 'r quw.'r tqxkf kpi pgy 'r tqo r w'qt "qyj gt"eqpvgpv'tgi wactn{.'wukpi  
 ðNkxgö'hgcwt gu'qt "qyj gt 'hcegu'qh'yj gug'uqekn'pgy qtnkpi r rlvhcto u'y qwf "dg'yj g'o quv'uweeguuhwn  
 utcvgi kgu'vq'uwuxkp'c'nqpi /vgo "cpf 'vki j vmpk'eqo o wplv{ ctqwpf 'vj gug'kf gcu0

### References

D³pkæj /Dtgf plej . 'Dtki kwg0\$Y tkkpi 'yj g'Gyj pqi tcr j le Uqt { <Eqputwvki 'P cttcvxg'qw'qh  
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 j wr u<lf qkQti B20737 hcdwrc/423: /2224

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 Sociology*. 42\*4+."383/39; 0

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 Uwf { "co qpi 'Cwgpf ggu'qh'cp'Cplo cn'Y grhctg'U{o r qukwo 0*Animals*, 8.'0f qk<  
 3205; 2 kpk 322396

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 Tcvgu')Ceegrtcvkpi )'ó'Wpkgf 'P cvkpu'Uwuxkpcdng F gxgr o gpv0'Wpkgf 'P cvkpu.'Wpkgf  
 P cvkpu.'8'O c { '423; .  
 y y y 0wp0ti luwuxkpcdngf gxgr o gpvldnqi 423; 127 lpcwt g/f gerkpq/wpr tgeg f gpvgf /tgr qt v0

F ko gt.'O C.'Kppctknk'H'Vtk'CP.'I ctuj grk.'FN. Ectvt.'P J 0Ct v'hekn'pki j v'iki j v'j gr u'ceeqwpv  
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pgy 'r quidkrlkgu0Journal of Environmental Education. 50\*668+:'62566370  
[j wr u<l f qkQti B2B2: 2122; 7: ; 860423; B8: 9633](#)

Lcpg'I qqf cni'kpukswg'P gy '\ gcrpf 0\$Cplo cni'Ugpkpeg\$. F ge'3; . '423; .  
[j wr u<l y y 0 qwwdg0eqo ly cvej Ax? qQni I uP 9IZK hgcwtg? go da vkr0](#)

Mktmg { 'UO( 'J gm tglej . 'U0\*4232+0Vj g'Go gti gpeg qh'O wnkur geku'Gvj pqi tcr j {0E wmwtn  
Cpj tqr qmji { . '47\*6+:'767/7980

Nctuqp. 'Nkpeqp' T0Ectgp' D0Eqqr gt( 'O ctni'G0J cwdgt \*4238+'Go qvqpu'cu'F tkxgtu'qh'Y krf rkhg  
Ugy ctf uj kr 'Dgj cxlqt<'Gzco klpki 'Ekkk gp' Uelgpeg'P guv O qpkqtu0T gur qpugu'vq' kpxcukxg  
J qwug'Ur cttqy u. 'J wo cp'F ko gpukqpu'qh'Y krf rkhg. '43-3. 3: /55. 'F QK

O cplhtgf q. 'O l0'Vgnn' VN0'F qp'Ectnqu. 'C0Y 0'Uwnkxcp. N0'Dtki j v' C0F 0'F kgvej . 'C00 0  
Dtwnmqwt. 'L0'cpf 'Hwnqp. 'F 0\*4242+'Vj g'ej cpi kpi uqekqewmwtn'eqpvzv'qh'y krf rkhg  
eqpugtxcvqp0Eqpugtxcvqp'Dkqmi {0f qk32B333 lqdkB56; 5

Rcrgeq. 'E0'Rgvt. 'U0I 0'Ugqcp. 'P 0'U' Mewho cpp. l0( 'Cti {tk' R0\*4243+0'kpenwukxgpguu'cpf  
F kxgtukx\ 'kp' Ekkk gp' Uelgpeg'0Vj g' Uelgpeg'qh' Ekkk gp Uelgpeg. '483/4: 40

Tlej ctf uqp. 'N0\*4223+0I gwki 'r gtuqpcn<'Y tkkpi /uqtkgu0kpvgtpcvqpcn' Lqwtpcn'qh'S wcrkcvkxg  
Uwflgu'lp' Gf wecvkp. '36\*3+:'55/5: 0

Ueqw. 'F cy p' O 0'gv'cni0\$Ur cvkn'F kntkdwkqp'qh' Ucteqr vke O cpi g' \*Ucteqr vgu' uedckk+lp' Wtdcp  
Hqzgu' \*Xwr gu'xwr gu+lp' I tgcv' Dtkckp' cu'F gvto kpgf d { 'Ekkk gp' Uelgpeg\$' Wtdcp  
Gequ{ ugo u'4507 \*4242+<'3349/620RtqS wgu0Y gd09 Qev042420

Vtngxu. 'C0'gv'cni0\$Uwv'Rt gugtxcvqp0'Dkqmi kecn'Eqpugtxcvqp. 'xqr044; . '423; . 'r r 0356663.  
f qkj wr u<l f qkQti B2B238 l0kqeqp0423: B3B3: 0

Y crnej . 'Ctkcp' F 0'gv'cni0\$Uwo o qkpi 'eqo r cuukqp'vq cff tguu'y g'ej cmgpi gu'qh'eqpugtxcvqp0\$  
Eqpugtxcvqp'Dkqmi { '54B' \*423: +<'3477/34870

.. | f go kt. 'Xwtcni0\*4242+0\$Qpg'P cwtgö<'C'P gy 'Xqecdwrnt { cpf 'Hico g' hqt' I qxgtcpeg  
kppqxcvqp'lp' Rquv'Eqxkf /3; 'Rrpgvct { 'J gcrnj 0C' Lqwtpcn qh'kvgi tvkxg' Dkqmi { . 'xqr046B3

**Appendix A.**

**Recruitment and Informed Consent Message (Sent to participant after joining the Facebook group)**

Vj cpm{ qwhqt "{ qwt 'kpvgt gu'kp'r ct vkr c'kpi 'kp'qwt uwf {0Vj tqwi j 'y ku'tgugctej 'y g'j qr g'v'gdwgt wpf gtucpf 'y g'y c{u'j wo cp'hggnkpi u'cdqw'cpko cni'ugpvkpeg cpf 'go qv'kqp'ecp'ko r cev'y g vgcwo gpv'qh'cpko cni'cpf 'c'kwf gu'cdqw'eqpugt'xcv'kqp0

Ki{ qw'ci tgg'v'cng'r ctv'kp'y ku'uwf {."{ qw'y kndg'cungf 'v'uwo k'r gtuqpcn'cpgef qv'gu'cdqw"{ qwt kpvgtcevkpu'y kj 'y kf rkhg0Kp "{ qwt 't'gur qpugu'y g'gpeqwtci g { qw'v'g'gh'ge'v'qp "{ qwt go qv'kpcn'eqppgevkqp 'v'y kf "cpko cni'cpf "{ qwt 'kpvgr t'gcv'kqp qh'cpko cni'go qv'kqp0Y g y greqo g'y g'uwo k'kqp'qh'pette'v'x'gu.'r j qv'i t'cr j u. x'kf gqu'cpf l'qt 'cwf k'q'tgeqtf kpi u'qh { qwt 'kpvgtcevkpu'y kj 'y kf rkhg0

Y g'ctg'j qr kpi "{ qw'o c{ 'dgpgh'v'htqo 'd'gkpi 'kp'y ku'uwf { cpf 'kp'y g'eqo o w'pk'v' 'etgcvf 'y tqwi j qwt'r r'v'htqo 'y j lej 'y k'ni'huvt'o g'cpkpi h'w'eqpxgtucv'kpu'cdqw'r ct vkr cpw'o j wo cp/cpko cni'kpvgtcevkpu'0Vj g'tgugctej gtu'j qr g'v' i g'p'gtcv'g'npqy r'gf i g'cdqw'y g't'qng'qh j wo cp'w'pf gtucpf kpi 'qh'ugpvkpeg'kp'eqpugt'xcv'kqp'r t'ce'v'egu y c'v'o c{ 'dgpgh'v'v'q'ek'v'0

Vj g'tgeqtf u'qh'y ku'uwf { 'y k'ni'dg'ngr v'r t'k'cv'g0Kp cp{ 'u'qt'v'qh't'gr q't'v'y g'o c{ 'r w'rkuj . 'y g'y k'ni'pqv k'penf g'cp{ 'k'ph'qto c'v'kqp'y c'v'y k'ni'o cng'k'r qu'k'dng v'q'k'f g'p'v'kh{ "{ qw'kh{ qw'y kuj 'v'q't'go c'kp cp'qp{ o q'w'0Ki{ qw'j c'x'g's w'gu'v'kpu'cdqw'y ku'tgugctej . { qw'o c{ 'e'q'p'cev'lg'p'p'k'gt 'U'ej c'w'gt. l'g'p'p'k'gt'0ngm{ 5B de'Q'f w.'839/774/63520

D{ 'v'r kpi "{ qwt 'h'w'ni'pco g'kp'y ku'v'gz'v'dqz. "{ qw'ctg ci t'ggkpi 'v'q'dg'kp'y ku'uwf {00 cng'uw'g' "{ qw