

1  
00:00:00,000 --> 00:00:06,660  
beaker Dean Radin he is I'm sure

2  
00:00:03,710 --> 00:00:08,339  
familiar to the majority of the people

3  
00:00:06,660 --> 00:00:10,439  
here if you're not familiar with his

4  
00:00:08,339 --> 00:00:13,530  
work i recommend you become familiar

5  
00:00:10,439 --> 00:00:16,138  
he's the senior scientist at ions he's

6  
00:00:13,529 --> 00:00:18,000  
got several faculty appointments he's

7  
00:00:16,138 --> 00:00:20,820  
the author of I think about two hundred

8  
00:00:18,000 --> 00:00:22,589  
articles two wonderful books the

9  
00:00:20,820 --> 00:00:27,060  
conscious universe and most recently

10  
00:00:22,589 --> 00:00:29,189  
entangled minds he speaks widely many

11  
00:00:27,059 --> 00:00:31,528  
conferences were very happy to have him

12  
00:00:29,189 --> 00:00:33,299  
here he was at I seem as an invited

13  
00:00:31,528 --> 00:00:36,299  
speaker just before he's been on

14  
00:00:33,299 --> 00:00:38,429  
television radio all over his work is

15  
00:00:36,299 --> 00:00:43,669  
wonderful and he will be speaking on

16  
00:00:38,429 --> 00:00:43,670  
gazing at the mind's eye deep thank you

17  
00:00:47,329 --> 00:00:53,549  
I'm going to talk about two experiments

18  
00:00:50,039 --> 00:00:55,530  
and a little bit about an experiment

19  
00:00:53,549 --> 00:01:00,628  
that's on the drawing board and about to

20  
00:00:55,530 --> 00:01:03,000  
be run first one is presenting it which

21  
00:01:00,628 --> 00:01:05,728  
Garrett gave a good overview for

22  
00:01:03,000 --> 00:01:07,109  
presenta men is a feeling about an event

23  
00:01:05,728 --> 00:01:09,298  
in the future as opposed to a

24  
00:01:07,109 --> 00:01:12,209  
precognition which is a knowing about an

25  
00:01:09,299 --> 00:01:14,189  
event it could also be thought of

26  
00:01:12,209 --> 00:01:16,459  
typically as a vague sense of impending

27  
00:01:14,188 --> 00:01:16,459  
doom

28  
00:01:24,219 --> 00:01:28,370  
so here's how the experiment is designed

29

00:01:26,359 --> 00:01:29,689  
it's intentionally designed to be

30  
00:01:28,370 --> 00:01:32,090  
very simple and to look like

31  
00:01:29,689 --> 00:01:34,219  
psychophysiology 101 and it's based on

32  
00:01:32,090 --> 00:01:36,049  
that kind of design so you sit somebody

33  
00:01:34,219 --> 00:01:38,079  
down in front of a blank computer screen

34  
00:01:36,049 --> 00:01:40,250  
and you record some form of

35  
00:01:38,079 --> 00:01:41,689  
physiological measurement I typically

36  
00:01:40,250 --> 00:01:44,659  
use skin conductance although have you

37  
00:01:41,689 --> 00:01:46,189  
looked at others as well then they press

38  
00:01:44,659 --> 00:01:48,560  
a button when they're ready to begin the

39  
00:01:46,189 --> 00:01:50,480  
screen remains blank for five seconds

40  
00:01:48,560 --> 00:01:53,240  
and after the five seconds in the

41  
00:01:50,480 --> 00:01:56,120  
computer makes a truly random decision

42  
00:01:53,239 --> 00:01:58,369  
by dipping into a pool of six or seven

43  
00:01:56,120 --> 00:02:00,859

hundred pictures and selects one and

44

00:01:58,370 --> 00:02:02,570

then it shows it for three seconds it

45

00:02:00,859 --> 00:02:04,879

could either be a calm picture like a

46

00:02:02,569 --> 00:02:07,549

bunny or an emotional picture like a

47

00:02:04,879 --> 00:02:11,359

snake unless you're a bunny ologist or a

48

00:02:07,549 --> 00:02:12,919

herpetologist to their always

49

00:02:11,360 --> 00:02:16,370

idiosyncratic responses to these

50

00:02:12,919 --> 00:02:19,879

pictures and then 10 seconds goes by and

51

00:02:16,370 --> 00:02:22,009

you repeat this typically 30 to 40

52

00:02:19,879 --> 00:02:23,959

trials in one session so the whole

53

00:02:22,009 --> 00:02:26,539

experiment takes maybe 15 minutes at

54

00:02:23,959 --> 00:02:28,009

most what I'm going to show you now is a

55

00:02:26,539 --> 00:02:29,810

video clip that lasts about three

56

00:02:28,009 --> 00:02:32,870

minutes three or four minutes that was

57

00:02:29,810 --> 00:02:35,180

taken by the BBC for their science show

58  
00:02:32,870 --> 00:02:38,569  
called the horizon it's also now being

59  
00:02:35,180 --> 00:02:44,620  
shown in the US by discovery science by

60  
00:02:38,569 --> 00:02:44,620  
some other title here's an example of it

61  
00:02:44,830 --> 00:02:51,530  
this dr. Dean Radin is hoping that he

62  
00:02:49,729 --> 00:02:54,018  
can prove that what the pilots call

63  
00:02:51,530 --> 00:02:56,870  
prediction could in fact be precognition

64  
00:02:54,019 --> 00:02:59,319  
a real ability to actually sense the

65  
00:02:56,870 --> 00:02:59,319  
future

66  
00:03:01,659 --> 00:03:06,439  
his experiment records a person's

67  
00:03:04,310 --> 00:03:09,229  
emotional response to a series of

68  
00:03:06,439 --> 00:03:11,240  
pictures the images are from an

69  
00:03:09,229 --> 00:03:13,879  
internationally approved clinical test

70  
00:03:11,240 --> 00:03:19,010  
for emotional response and are selected

71  
00:03:13,879 --> 00:03:21,019  
by the computer at random well we're

72  
00:03:19,009 --> 00:03:23,030  
expecting to see is that after a picture

73  
00:03:21,020 --> 00:03:24,740  
is seen if it's an emotional picture you

74  
00:03:23,030 --> 00:03:28,280  
get a large rise and skin conductance

75  
00:03:24,740 --> 00:03:33,200  
and after a calm picture person remains

76  
00:03:28,280 --> 00:03:36,920  
calm it'll continue to go down so far so

77  
00:03:33,199 --> 00:03:39,919  
good and unremarkable but what Dean is

78  
00:03:36,919 --> 00:03:44,119  
looking for is what happens before the

79  
00:03:39,919 --> 00:03:45,979  
randomly selected picture is shown we

80  
00:03:44,120 --> 00:03:47,780  
hope to see then as at before the

81  
00:03:45,979 --> 00:03:50,359  
emotional picture skin conductance will

82  
00:03:47,780 --> 00:03:51,770  
already begin to go up and before the

83  
00:03:50,360 --> 00:03:57,950  
calm picture skin conductance will

84  
00:03:51,770 --> 00:04:00,710  
remain low and if that occurs and it

85  
00:03:57,949 --> 00:04:02,719  
shows that there's some aspect of us

86

00:04:00,710 --> 00:04:05,710  
that is able to outguess what is

87  
00:04:02,719 --> 00:04:05,710  
otherwise a random process

88  
00:04:06,810 --> 00:04:13,060  
if this happens then Dean will have

89  
00:04:10,060 --> 00:04:18,939  
tangible evidence of an ability to sense

90  
00:04:13,060 --> 00:04:21,220  
the future but for the experiment to

91  
00:04:18,939 --> 00:04:27,040  
carry any weight the effect has to be

92  
00:04:21,220 --> 00:04:29,229  
observed consistently well if it happens

93  
00:04:27,040 --> 00:04:30,970  
completely randomly that's guessing if

94  
00:04:29,228 --> 00:04:33,339  
it happens in such a way so that it is

95  
00:04:30,970 --> 00:04:35,260  
systematic and it suggests that it's not

96  
00:04:33,339 --> 00:04:39,459  
guessing but it's actually some

97  
00:04:35,259 --> 00:04:41,110  
perception of the future pictures where

98  
00:04:39,459 --> 00:04:44,138  
you're interested teams analyzed the

99  
00:04:41,110 --> 00:04:46,660  
data from his experiments this is the

100  
00:04:44,139 --> 00:04:49,780

sector period before the picture

101

00:04:46,660 --> 00:04:54,270

appeared and as you see in both cases

102

00:04:49,779 --> 00:04:54,269

anticipation of what you're about to see

103

00:04:54,300 --> 00:04:59,978

they show that for three or more seconds

104

00:04:57,370 --> 00:05:03,699

before an image is shown skin

105

00:04:59,978 --> 00:05:06,839

conductance does change consistently in

106

00:05:03,699 --> 00:05:10,000

anticipation of that future image

107

00:05:06,839 --> 00:05:12,728

incredibly the blue graph shows that

108

00:05:10,000 --> 00:05:15,610

before a calm picture the anticipation

109

00:05:12,728 --> 00:05:18,699

is calm but before an emotional picture

110

00:05:15,610 --> 00:05:22,919

is shown the red trace shows that the

111

00:05:18,699 --> 00:05:22,918

anticipation is emotional too

112

00:05:26,769 --> 00:05:31,699

so when you do an in Samba LAN alisis

113

00:05:29,899 --> 00:05:34,129

you do one subject who does repeated

114

00:05:31,699 --> 00:05:36,589

trials of this type what you can do is

115  
00:05:34,129 --> 00:05:38,719  
show the average of all of the emotional

116  
00:05:36,589 --> 00:05:41,569  
trials that they got average of all of

117  
00:05:38,720 --> 00:05:44,180  
the calm trials you see where the trial

118  
00:05:41,569 --> 00:05:47,240  
begins they press a button where the

119  
00:05:44,180 --> 00:05:50,449  
stimulus occurs and that difference in

120  
00:05:47,240 --> 00:05:51,980  
the baseline is the presentment effect

121  
00:05:50,449 --> 00:05:54,469  
in this case it's statistically

122  
00:05:51,980 --> 00:05:56,210  
significant in one subject so I've done

123  
00:05:54,470 --> 00:05:59,000  
this kind of experiment many times

124  
00:05:56,209 --> 00:06:01,009  
probably most between 96 and 2000 one

125  
00:05:59,000 --> 00:06:03,680  
using skin conductance SEL is skin

126  
00:06:01,009 --> 00:06:05,240  
conductance level and you get a very

127  
00:06:03,680 --> 00:06:06,980  
strong result and these are typically

128  
00:06:05,240 --> 00:06:08,990  
unselected people who happen to just be

129  
00:06:06,980 --> 00:06:11,240  
around who are interested in trying it

130  
00:06:08,990 --> 00:06:13,550  
some people who claim that they have

131  
00:06:11,240 --> 00:06:15,889  
precognitive experiences tend to do

132  
00:06:13,550 --> 00:06:18,350  
better on this test than an average

133  
00:06:15,889 --> 00:06:21,110  
person there are also people who don't

134  
00:06:18,350 --> 00:06:24,080  
do very well at this at all typically

135  
00:06:21,110 --> 00:06:26,930  
psychotherapist do very badly on this

136  
00:06:24,079 --> 00:06:28,579  
test and I think the reason is that it's

137  
00:06:26,930 --> 00:06:30,280  
a test that that's looking at your

138  
00:06:28,579 --> 00:06:32,149  
emotional response to pictures and

139  
00:06:30,279 --> 00:06:34,459  
psychotherapist tend to go into therapy

140  
00:06:32,149 --> 00:06:37,939  
mode where they specifically learned to

141  
00:06:34,459 --> 00:06:39,409  
not respond to the the emotional input

142  
00:06:37,939 --> 00:06:43,129  
because otherwise it would freak out

143

00:06:39,410 --> 00:06:46,100  
client so I tell both psychotherapist

144  
00:06:43,129 --> 00:06:47,569  
and also meditators to not do that but

145  
00:06:46,100 --> 00:06:48,800  
to allow that yourself to feel the

146  
00:06:47,569 --> 00:06:52,490  
emotion because otherwise there's

147  
00:06:48,800 --> 00:06:54,500  
nothing in your future to respond to so

148  
00:06:52,490 --> 00:06:56,300  
of course we do due diligence on this to

149  
00:06:54,500 --> 00:06:58,040  
look at every possible conventional

150  
00:06:56,300 --> 00:07:01,639  
explanation we can think of that might

151  
00:06:58,040 --> 00:07:04,100  
explain these results the all of the

152  
00:07:01,639 --> 00:07:05,750  
ones on the top from sensory cues all

153  
00:07:04,100 --> 00:07:07,730  
the way down to subject fraud we're

154  
00:07:05,750 --> 00:07:09,949  
pretty well sure that this is not a good

155  
00:07:07,730 --> 00:07:11,240  
explanation the one that usually people

156  
00:07:09,949 --> 00:07:13,490  
then think about is maybe it's an

157  
00:07:11,240 --> 00:07:16,310

anticipatory effect it's a physiological

158

00:07:13,490 --> 00:07:18,050

form of the gamblers fallacy but we've

159

00:07:16,310 --> 00:07:19,699

looked at that in detail as well and

160

00:07:18,050 --> 00:07:21,920

everyone who's conducted these

161

00:07:19,699 --> 00:07:23,810

experiments and get significant results

162

00:07:21,920 --> 00:07:25,400

don't find any evidence that this is an

163

00:07:23,810 --> 00:07:28,790

anticipatory effect he's not a

164

00:07:25,399 --> 00:07:30,349

conventional one and as Garrett

165

00:07:28,790 --> 00:07:32,360

mentioned a dick bearman has done a

166

00:07:30,350 --> 00:07:35,629

version of this in the functional MRI

167

00:07:32,360 --> 00:07:36,439

and found that the amygdala is the spot

168

00:07:35,629 --> 00:07:38,180

that

169

00:07:36,439 --> 00:07:41,000

that lights up and you notice there's a

170

00:07:38,180 --> 00:07:43,100

slightly larger effect in the right

171

00:07:41,000 --> 00:07:46,939

brain which I'm going to talk about a

172  
00:07:43,100 --> 00:07:49,370  
little bit later so today I'm aware of

173  
00:07:46,939 --> 00:07:50,990  
twenty presentiments periments using a

174  
00:07:49,370 --> 00:07:52,490  
variety of different kinds of

175  
00:07:50,990 --> 00:07:56,480  
physiological measurements from skin

176  
00:07:52,490 --> 00:07:57,620  
conductance fMRI heart rate EEG this

177  
00:07:56,480 --> 00:08:00,200  
what I'm going to talk about now is

178  
00:07:57,620 --> 00:08:02,540  
pupil dilation of these experiments I

179  
00:08:00,199 --> 00:08:04,939  
think only two went in the non predicted

180  
00:08:02,540 --> 00:08:07,129  
direction and 11 are statistically

181  
00:08:04,939 --> 00:08:09,019  
significant so we haven't done a formal

182  
00:08:07,129 --> 00:08:10,490  
meta-analysis yet but if we do one it's

183  
00:08:09,019 --> 00:08:15,289  
going to be a whopping ly significant

184  
00:08:10,490 --> 00:08:17,210  
effect so presenting and pupil dilation

185  
00:08:15,290 --> 00:08:19,310  
the reason I got interested in this is

186  
00:08:17,209 --> 00:08:21,769  
because the pupil is a very interesting

187  
00:08:19,310 --> 00:08:23,360  
target to use it shows a balance between

188  
00:08:21,769 --> 00:08:26,149  
the sympathetic and the parasympathetic

189  
00:08:23,360 --> 00:08:27,889  
nervous system you can also tell you can

190  
00:08:26,149 --> 00:08:29,629  
infer all kinds of interesting things by

191  
00:08:27,889 --> 00:08:32,418  
where the eye is looking and also by how

192  
00:08:29,629 --> 00:08:34,580  
often you blink an addition allows us to

193  
00:08:32,418 --> 00:08:37,218  
look more poetically at this idea of

194  
00:08:34,580 --> 00:08:39,320  
what does the C or C when you're seeing

195  
00:08:37,219 --> 00:08:41,780  
something especially you're seeing it in

196  
00:08:39,320 --> 00:08:44,270  
the future well what is that so it

197  
00:08:41,779 --> 00:08:47,329  
allowed us to do a test of that sort so

198  
00:08:44,269 --> 00:08:49,370  
here is a Celeste sitting in the eye

199  
00:08:47,330 --> 00:08:52,820  
tracker there's a little camera over

200

00:08:49,370 --> 00:08:54,950  
here that's looking at awry but the

201  
00:08:52,820 --> 00:08:57,470  
experimenter QC is a close-up of her

202  
00:08:54,950 --> 00:08:59,210  
pupil with the software or the firmware

203  
00:08:57,470 --> 00:09:01,160  
actually will detect where her pupil is

204  
00:08:59,210 --> 00:09:03,259  
and 60 times a second measure how big it

205  
00:09:01,159 --> 00:09:05,360  
is and also put crosshairs over where

206  
00:09:03,259 --> 00:09:06,559  
her eye is looking so on the top I can

207  
00:09:05,360 --> 00:09:08,629  
see what she's looking at in the

208  
00:09:06,559 --> 00:09:13,789  
crosshairs tell me exactly where in that

209  
00:09:08,629 --> 00:09:16,070  
picture she's looking so what we get

210  
00:09:13,789 --> 00:09:19,399  
then is this section is before the

211  
00:09:16,070 --> 00:09:20,690  
stimulus appears and this section is

212  
00:09:19,399 --> 00:09:24,259  
during the stimulus I don't know why

213  
00:09:20,690 --> 00:09:26,360  
these little esas drop down this that

214  
00:09:24,259 --> 00:09:28,279

this curve corresponds to emotional

215

00:09:26,360 --> 00:09:30,860

pictures and this curve to calm pictures

216

00:09:28,279 --> 00:09:32,480

and that difference is the presentment

217

00:09:30,860 --> 00:09:34,159

difference that we're looking for so I

218

00:09:32,480 --> 00:09:35,509

expected to see this because it's

219

00:09:34,159 --> 00:09:38,419

basically the same as using skin

220

00:09:35,509 --> 00:09:40,039

conductance but now that we got a

221

00:09:38,419 --> 00:09:43,879

significant effect it allowed me to look

222

00:09:40,039 --> 00:09:46,969

at some other things for example people

223

00:09:43,879 --> 00:09:48,320

blink more before seeing an emotional

224

00:09:46,970 --> 00:09:50,240

picture than before seeing a calm

225

00:09:48,320 --> 00:09:51,560

picture the way you infer this

226

00:09:50,240 --> 00:09:53,839

the night racking system is when your

227

00:09:51,559 --> 00:09:56,088

eye is closed you lose data about the

228

00:09:53,839 --> 00:09:59,029

pupil and so every time you guys closed

229

00:09:56,089 --> 00:10:01,899

I'm plotting here actually proportion of

230

00:09:59,028 --> 00:10:01,899

missing data there's