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**The ups, downs and colourful performances involved in working from home during the  
Corona virus pandemic 2020: The Best Survey You Will See**

Executive Summary

*The key to an employee's good performance while working from home was 'happiness'. Happiness, engendered by a combination of active social and business connections, and of being allowed the autonomy to manage jobs as the worker saw fit.*

*Results were dramatic. Autonomous, connected home workers felt more psychologically comfortable. This meant reduced stress, better engagement with all levels of the organization, higher feelings of creativity and sustained levels of performance. Unhappy workers, meanwhile, suffered across all fronts including their intellectual performance, which was significantly worse than those of their happier peers.*

*In a connected experiment exploring colour, respondents working on a quiz presented on a red background performed significantly worse than colleagues doing exactly the same quiz on a white or blue background. All results are discussed.*



### *Premise*

A survey was issued to people who were working from home as a result of the Coronavirus lockdown imposed in March 2020. Answers were collected between 24<sup>th</sup> June and 4<sup>th</sup> July 2020; when lockdown restrictions were just beginning to lift. This provided the ideal window to assess (a) how workers had coped during the strict conditions imposed since the start of the pandemic, and (b) how they looked ahead to the new and uncertain world unfolding before them.

### *Project questions*

We wanted to find the answers to the following questions:

1. How have people coped during the Covid19 pandemic while working from home?
2. What lessons can we take from this time of home working to make the return to the office more bearable?
3. What can be done to improve the office of the future, starting now?
4. What can be done to make homeworking conditions better in the future?

### *Performance questions*

5. Does a sense of well-being affect performance?

...then as extra questions

6. Does colour affect how people feel and react to their home working situation?
7. Does colour affect quantifiable performance



### *Demographics*

*Gender:* Of the 124 participants, 71 identified as female, 49 as male, 1 as transgender with 3 categorizing as 'other'. The average age of a participant was 41.6 years old.

*Hierarchy:* 7% considered themselves to be non-management staff, 9% Junior management, 23% middle management, 38% Senior management; 10% saw themselves as contractors and the rest defined themselves as 'other' including a plumber, a locum GP, an electrician and an architect.

*Length of service:* 23% had been in their current post for under a year; 31% for between one and four years; 19% between four and nine years; 17% between ten and 14 years; 6% between 15 and 19 years, and the remainder over 20 years

*Geography:* Of the respondents, 80% were from the UK, 6% from North America, 5% from mainland Europe, 5% from Ireland, and 3% from Australasia.

### *Process*

Participants followed a link to one of three on-line questionnaires, each carried 64 survey questions (all of which were set against a 100-point sliding scale), a series of demographic questions and a six-question quiz. While these elements were unchanging for every participant, the colour of the surveys varied.

We wanted to assess whether colour affected how people felt while answering the questions, or how they performed intellectually. The backgrounds were, red, white and blue. What else for a British project?

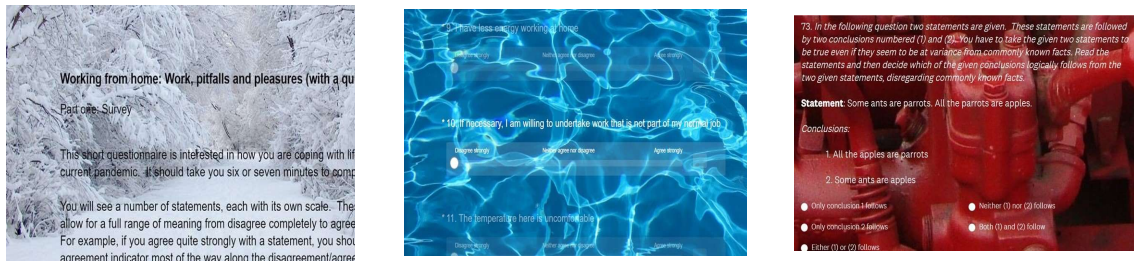


Figure 1. Same survey, different colours. Introduction (shown in white), survey question (blue) and a quiz question (red)

*The Quiz:* Comprised six questions. As an example the second of these (shown on the red background above) ran as follows –

*In the following question two statements are given. These statements are followed by two conclusions numbered (1) and (2). You have to take the given two statements to be true even if they seem to be at variance from commonly known facts. Read the statements and then decide which of the given conclusions logically follows from the two given statements, disregarding commonly known facts.*

Statement: Some ants are parrots. All the parrots are apples.

Conclusions:

1. All the apples are parrots
2. Some ants are apples

The respondent then had to calculate which of the following answers was correct:

- Only conclusion 1 follows
- Only conclusion 2 follow
- Either (1) or (2) follows
- Neither (1) or (2) follows
- Both (1) and (2) follows



All questions were of a similar standard. The answer, by the way, is shown in the footnote<sup>1</sup>.

### *Hypotheses*

Given our project questions (see above), we hypothesized that:

- i) People with good social networks would score better on all key variables than people who were more isolated. This would be particularly true in terms of happiness, stress, altruism and creativity
- ii) People with high levels of autonomy would outscore their less autonomous peers across key variables

In terms of performance variables:

- iii) People who felt better (in terms of happiness, stress, altruism and creativity) would be more successful on an intellectual challenge (the quiz)

In terms of colour

- iv) We expected the colour of the questionnaire to make no difference at all

### *Aim*

This survey was never going to be the largest test of Coronavirus workers. Instead it concentrated high levels of scientific rigour on commercial data. This enabled us to

- i) Identify which questions were useful in measuring what affected people as they worked from home
- ii) Discard questions that had little or no effect
- iii) Build answers into meaningful, powerful scales; each of which comprised a range of questions to underwrite reliability. Thus we could...

<sup>1</sup>The answer to the example question is “Only conclusion 2 follows”

- iv) ...avoid misleading single question, ‘so what?’ analysis (e.g. “75% of people are happy working from home.” which is terrific of course, but what does it tell us? You can be absolutely certain, for example, that plenty more than 25% will be just as happy working from the office). Instead we were able to...
- v) Transform the data into an easy to understand, reliable and insightful model (see p.13).

## Results

### Scales

Our 64 questions fitted into 12 discreet scales, of which the nine major scales are shown in Table 1 (below). This table shows the mean scores for participants across each scale and how the scales correlate.

Table 1: Scales correlation tables

	Mean Score/ 100	Std D	1	2	3	4	5	6	7	8	9
1.Autonomy	62.85	26.86	-	.82**	.79**	.59**	.78**	.20*	.69**	.69**	.87**
2.Network strength	64.12	25.39		-	.76**	.82**	.63**	.25**	.68**	.75**	.92**
3.Workplace Interaction	54.65	23.93			-	.53**	.74**	.14	.74**	.67**	.84**
4.Organizational Identity	70.04	25.64				-	.47**	.15	.47**	.65**	.73**
5.Wellness	59.18	23.40					-	.29**	.79**	.56**	.84**
6.Stress	59.07	22.73						-	.24**	.13	.34**
7.Creativity	53.00	23.52							-	.60**	.80**
8.Organizational Citizenship Behaviour	62.25	27.38								-	.82**
9.Happiness	61.41	18.57									-

\*\*  $p < .01$ ; \*  $p < .05$

## Performance

*Happiness:* The happiness scale (scale 9, above) took the average scores across each respondent's entire set of answers. This was then fitted onto a 100-point scale.

Respondents who scored under 50/100 on this scale were said to be unhappy (the mean score was 61); those scoring between 50-70 were said to be 'OK', those scoring 71 and above were said to be 'happy'.

Table 2: Intellectual performance based on *Happiness*

<i>Happiness level</i>	<i>Score/30 (5 points for a correct answer)</i>
Happy	19.35
OK	18.91
Unhappy	14.00*

Unhappy respondents scored significantly worse than respondents who were simply OK ( $p=.028$ )

*Colour:* The main purpose of reproducing the same questionnaire on three differently coloured backgrounds (red, white and blue), was to see if it affected intellectual performance. There is some evidence that red may over stimulate and therefore affect concentration ((Walters, Apter & Svebak, 1982).

Table 3: Intellectual performance based on *colour of survey*

<i>Happiness level</i>	<i>Score/30 (5 points for a correct answer)</i>
Red	14.48
White	19.22
Blue	18.27

Respondents attempting the quiz on a red background scored significantly worse than respondents who answered on a blue or white background ( $p=.047$ )

As a quick aside, there was no correlation between respondents who completed a red questionnaire and unhappiness. The two results are discrete.

## Discussion

### *Discussion 1. Performance Data*

*Performance data (colour).* There was hope but little expectation that colour would make any difference at all to a performance test such as our quiz, which was presented as something respondent might like to try just for fun. The colours were chosen because blue and red are at opposite ends of the colour spectrum. The widest visible difference seemed to give the best chance of a result. Meanwhile white is a useful control for this and – potentially – future experiments. Out of 124 respondents, 87 took the quiz: 29 in the red group, 32 in the white group and 26 blue.

In business, the psychology of colour is usually a field of nonsense. It avoids excellent but inconvenient pockets of research which fail to support commercial contention that blue is inspiring, green relaxing and red productive (amongst many other fanciful and frequently contradictory claims).





Our scientific survey found that, far from being productive, red inhibited intellectual performance. This, happily, did not support our sceptical hypothesis where we expected to find no effect for colour at all. We have a result worthy of further investigation.

*Performance data (unhappiness):* A stubborn 30% of our respondents were unhappy; some exceptionally so, scoring an average of under 10 out of 100 on the composite *Happiness* scale (compared to a mean of 61, with the highest scores exceeding 90).

It is extraordinary, however, to find that *unhappiness* is associated with depressed intellectual acuity. This not only speaks to misery at work producing poor results, but potentially (and for example) to unhappy children performing badly at school. Here may be one reason why the disadvantaged and less satisfied tend to perform worse than their peers across the generations. Perhaps the reasons behind low performances may lie not in a lack of intellectual ability *per se*, but in intellectual ability suppressed by circumstance.

### *Discussion 2. Survey Data, non-results*

*Perceived performance.* In part, this survey is notable for what it did not find. There is a widespread belief that productivity may be measured by questionnaire. This is an impossible nonsense. A point this survey set out demonstrate.

Just as with a car, a survey will tell you how people are feeling, how comfortable they are, or how stressed when things go awry.

Now consider the utility of a questionnaire when measuring a car's performance.

Cover up the speedo and ask, "What is your top speed?", or "How many miles per gallon are you doing?", or in human terms "How productive are you?"

We developed a *Perceived Performance Scale*, reproduced here:

Table 4: *Perceived performance*  $\alpha = .88$

<i>Question</i>	<i>Inter item Correlation</i>
My performance levels have dropped	.79
I cannot concentrate as well working from home	.77
I feel more productive	.73

The scale works beautifully. It is of a high standard with constituent questions that fit well together to measure the variable in question. No single item analysis here. So how well does perceived performance correlate with actual performance in the quiz. Let us have a look:

Table 5: *Perceived performance Versus Actual performance*

	Quiz Score	Perceived Performance
Pearson Correlation	1	.134
Significance (2-tailed)		.209
N	89	89
Pearson Correlation	.134	1

The figure we need to look at in table 5 is the *Significance* figure, which is the middle box on the right. For this to be a significant result – so that there is indeed a link between *Perceived* and *Actual* performance – this figure needs to be below .05. There is as you see, no correlation whatsoever between perception and reality. This is – barring flukes – *always* the case.



So the next time an architect, space planner, or management consultant claims that 80% of staff, when asked, stated that their productivity would improve following recommended changes, you might like to say, “That’s nice.” and then forget all about it. Anybody wafting a questionnaire about will be clueless about productivity; the information produced will be worthless at best. I should also say, dear reader that you – just like the author here – are no exception to this rule. We can’t tell either. No we can’t.

*No status difference:* When we run a survey, we check the demographics against the variables. What are the differences between females and males, between old and young, and across the organizational hierarchy?

In this project, for every demographic, across all variables and across the quiz scores, the same effects applied to everybody, in equal measure. No group was happier, none was more miserable. No particular demographic group shone in the quiz, none significantly disgraced themselves.

Generally, in the working environment, the higher up the pyramid one finds oneself, the better the outcomes. The phrase “Tough at the top” is as genuine as a six-pound note. Stress, illness, injury, death, all increase as you go down the greasy pole.

This does not seem to hold true when you work from home. A missed hypothesis was that *‘the young would be less satisfied and unhappier working from home than the older cohorts’*, but there was no evidence of this. In misery and joy, the lockdown – unlike the cause of the lockdown – has been even handed. Managers, almost entirely responsible for



the appalling conditions in so many workplaces, have yet to reach their hamfists into their colleagues' homes. Were this pattern to be repeated at work, so that everybody could share in the joys and failures and decisions; well, it would not only be interesting, it would be unequivocally better, as we see below.

*Identity theory:* I am longer in the tooth than an iced mammoth when it comes to building questionnaires. And just as the call of a mammoth was a hairy dinner bell for our ancestors, so identity scales are a source of statistical nourishment for psychologists. Identity is the variable that links the other together. If you identify with your employer then – the numbers say – you feel better, act better, indeed you are better because you feel connected to the place where you work.

Not when you are working from home though. When you build a statistical model, you use a system called *path analysis* which shows which factors affect which others and by how much. Identity is still important, but instead of being the Netball Centre, or the rugby scrumhalf, calling the shots in the middle of the field of play, its links are fewer. This logically sends identity variables (and there are three of them in this work; with the employer, with colleagues and with the country) to the end of the chain reaction, more acted upon than acting. So what is happening and where is the model?

So glad you asked.

Discussion 3. Survey Data, results

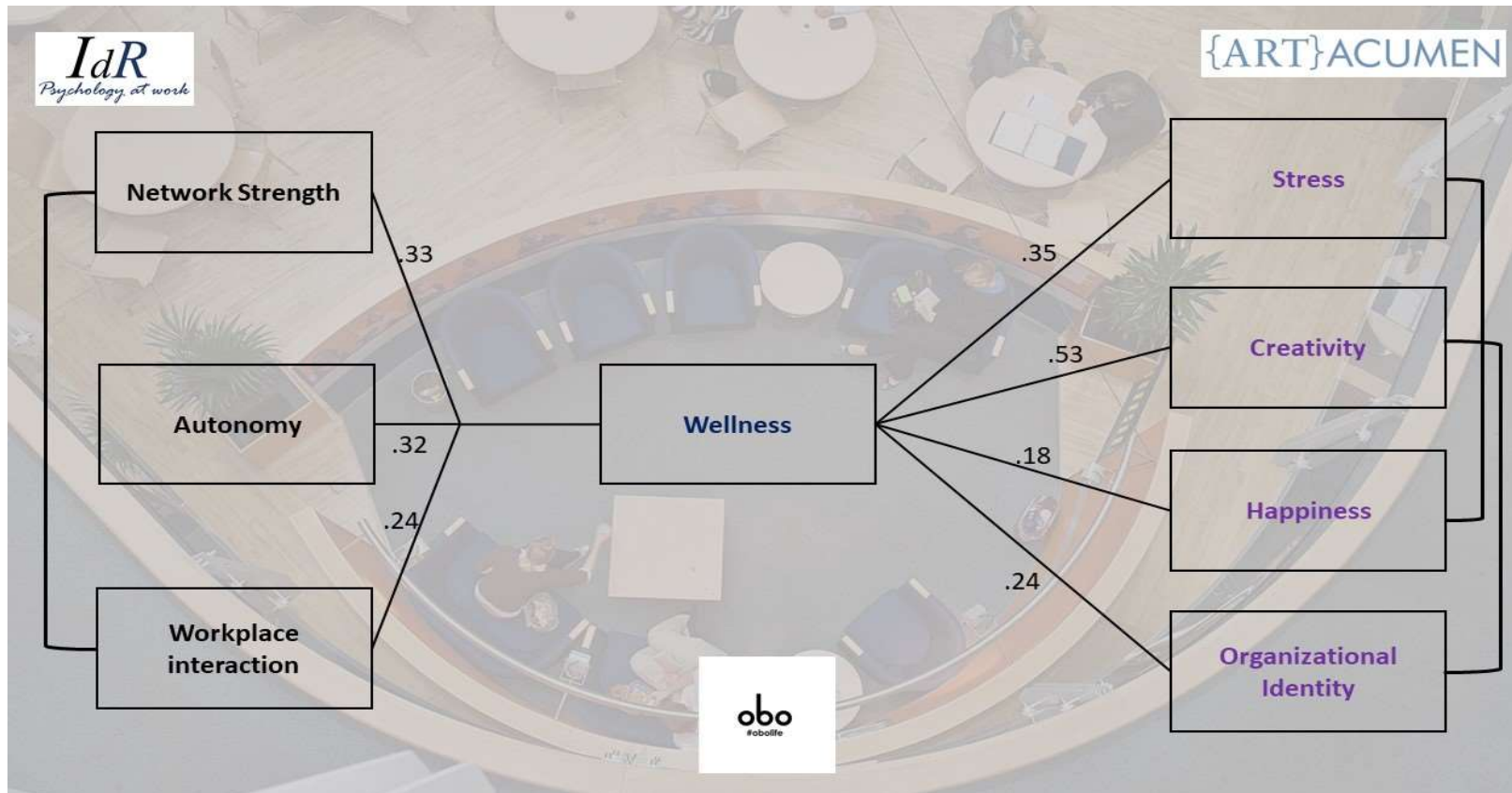


Figure 2: The model of the data showing the relationship between key variables. The numbers are beta co-efficients, showing the relationship between the variables. All these relationships are significant at  $p < .01$



The model of how and what people feel when working from home, together with what they want to take with them into the world of work is clear enough, but it took some finding. Now it should be said that this model is developed by using a technique called *path analysis*. Path analysis is a form of correlation. So there are no *causal* arrows on the model. Instead we see lines of connectivity. Surveys produce correlational data.

However, path analysis does *imply* causation. Further, these results fit with previous causal data (i.e., data drawn from field experiments). So I am – just a little contentiously perhaps – happy to infer causation with the caveat of the preceding paragraph.

*Network strength*: Although all variables shown are important, the first three are under organizational control. Businesses have it in their power to affect how people feel, behave and perform through their actions; good and bad.

*Network strength* (Three constituent questions: e.g., “I have made an effort to stay in contact with friends and family during the pandemic”). This variable links directly with a sense of identity with colleagues, business and country. The evidence from this survey strongly suggests that a happy worker needs a network of friends and family. When staff return to work, the strong suggestion is that communication with meaningful others should be encouraged. Thus, Facebook, TikTok, Twitter and so forth almost certainly have a place on the office computer. Ban them and you probably hamper happiness and performance.



The *Autonomy* scale (three constituent questions, e.g., “I can control my working environment to suit me”) suggested that people’s sense of general control has generally increased when working from home. This is a key reason why the mean happiness score is above the midpoint (i.e. at 61 and not 50 out of a possible maximum of 100). It is worth remembering as people return to the new, post-lockdown world that autonomy is food and water to good workplace function. So if made to operate under the draconian rules of organizational conformity, employees and the business will suffer. Performance declines in concert with wellness and happiness.

*Workplace interaction* (a five-question scale, e.g., “Interaction amongst the team has remained effective while working from home”). Just as a network of friends is important at work, so a network of colleagues is important when working from home. Results point to a world where colleagues are a vital resource. Just as Zoom is an alternative, but not a substitute, for face-to-face meetings; so the same relationship would seem to be true for home and office working. People will still need (a) to physically meet and (b) socially interact with their peers from work.



*Wellness*: When the three variables above are positive they generate wellness. And it is *Wellness* that drives the rest of the model. So, to the devil with my IP, here is the whole scale. This is vital stuff.

*Table 6: Wellness scale  $\alpha = .89$  (N=5, cases = 124)*

<i>Question</i>	<i>Inter item Correlation</i>
I enjoy working from home	.79
I feel calmer	.74
I am happier working from home	.63
My work/life balance is worse working from home	.71
I have a network of people who will support me	.66

Would all employers please note that *Wellness* has *nothing* to do with eating kale and fruit leathers. Neither is it connected with enforced workouts, nor biophilic spaces that look like a walnut.

Health fascism, or just screwing down one of the other forms of management control, is as pointless now as it was before the pandemic. Consider autonomy and the questions shown above.

People require other people. They also require freedom to make their own decisions, which includes access to chocolate biscuits and coffee. Give them access to these things and they will be psychologically well. If staff are psychologically well, they will thrive and so will the business.





## *Conclusions*

Most home workers that answered this survey, had a reasonably successful lockdown. These people largely had autonomy, they kept in contact with colleagues and friends. They did not *socially distance* (that most inept and inappropriate of phrases); they physically distanced and kept as socially close to others as they could.

Some, however, cut themselves off (or were cut off). They had few conversations and felt control over their life slipping away. These were the people who scored at worryingly low levels on the survey and just as poorly on the quiz. Misery and low performance seem to be lachrymose bedfellows. A strong network is important, people need support.

Employers should encourage – but not force – conversation. No more searchlight patrols of internet activity, scouring for – or banning altogether – visits to social media platforms. In doing this, organizations might as well take careful aim at their collective foot.

Allow conversations, give autonomy. This is not a soft approach; it is gloriously productive. Nobody is saying reduce targets or responsibilities. Just treat people like the adults they are. If they mess up, they go, but do not infantilize them. The science, the wellness and the money are on the wavelength of adult working. Managers are not – as results here evidence – an evolved species. They do just as badly and just as well as their junior colleagues.



Look at the model. If you want to (a) reduce stress, (b) increase happiness, (c) increase identity across and engagement within the organization, then affect the three variables at the front of the model; all fall under management's hegemony. You may even bring about an increase in that critical variable *Creativity*. The people who took up more hobbies and tried more things are the same people who found more autonomy, while maintaining contacts with colleagues and friends

People really do not need a slide in the office, nor having their portion sizes decided for them, nor having their work monitored. When they worked from home, these things were generally absent, and people were happier. Happiness was linked to better performance.

And as for colour, well...

The findings from this survey fit the social psychological literature which contends, essentially, that people are the best medicine for people, and that people should be trusted within their own environments. Happy employees are less stressed, easier to manage and produce better performances than unhappy counterparts. Meanwhile working from home is generally a good thing, but then so is working from the office. If the future treats people as sociable adults, then the pandemic will have brought some good in its wake.

Good luck in the times ahead.

*Craig Knight*

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