Designing The Calm in Chaos

Research into the affects of stress and how NeuroArchitecture contributes to young adult's wellbeing

EXECUTIVE SUMMARY

This research report explores the affects of stress and how NeuroArchitecture contributes to young adults' wellbeing. More specifically, it provides a rich understanding on how stress affects the brain and impacts well-being, as well as looking into ways to reduce stress, both ‘typical’ methods and design methods such as NeuroArchitecture.

From this, primary research was carried out using qualitative methods which found that the main causes of stress in young adults are from eduction, social pressures and money concerns. 55.3% of young adults say they experience stress weekly and 27.7% daily, which the majority say can last for a couple of hours. Another key piece of data that was found was that 93.6% of participants didn’t know what NeuroArchitecture was but agreed that spaces affected their mood. Identifying specific design features that increased their stress levels was found challenging unless prompted and found that most spaces that exist, don’t inspire them.

This report also acknowledges the gaps in existing research surrounding the education of life skills in young adults and healthy ways to manage stress. This has a severe impact on their wellbeing and overall health as it is nearly impossible to be independent without the correct skills. Therefore, giving designers the opportunity to highlight the importance of designing space with wellbeing and the mind, in mind.

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01 INTRODUCTION

Stress is a natural feeling most of us feel on a daily basis, whether it's from the chaos of work, social pressures, or money worries. Do we unknowingly put ourselves in environments that significantly increase our stress levels? The intention of this report is to show an understanding of how stress affects the body and the important role Architecture plays in our lives, even if it is subconscious, and how we can use design to positively shape young adult's wellbeing.

I will firstly explore literature that discusses how stress works in the brain, the negative repercussions it takes on health and lastly the different ways in which it can be reduced, including 'typical' methods and NeuroArchitecture design.

Secondly, I will carry out primary research by conducting a survey and holding interviews. These qualitative methods will allow further exploration of the research question, specifically in young adults. Thus, gaining a better understanding of the effects of stress and spaces through personal experiences and interactions. The findings in both the literature and primary research, will show the importance of having a range of perspectives. This will help highlight the gaps in knowledge so that I can design a space to inspire young adults to improve their quality of life whilst using key elements of NeuroArchitecture.

02 LITERATURE REVIEW

Understanding the Brain

To help manage stress, it's important to understand that stress is a natural reaction as it's the bodies way of activating our 'fight or flight' mode (LeWine, 2024; Pietrangelo, 2023). This protects us from any harmful or dangerous situations and therefore, shouldn't create any long-term effects in ashort period of time (Forth, 2024).

The stress response starts in the brain. When you are initially confronted by danger, your eyes and ears will automatically send information to the amygdala which is an area of the brain that interprets images and sounds, contributing to our ability to be able to emotionally process things (LeWine, 2024). When the threat has been perceived, a stress signal is sent to the hypothalamus which is like a small control centre in your brain that communicates with the rest of your body (Pietrangelo, 2023) through the autonomic nervous system controlling your heartbeat as well as blood pressure and breathing. The autonomic nervous system has two components: the sympathetic nervous system and the parasympathetic nervous system.
The sympathetic nervous system "functions like a gas pedal in a car, triggering the fight or flight response. This provides the body with a burst of energy so it can respond to perceived dangers." The parasympathetic nervous system does the opposite, "it acts like a brake. It promotes the 'rest and digest' response that calms the body down after danger has passed." (LeWine, 2023) The hypothalamus then activates the sympathetic nervous system, signalling the adrenal gland to pump adrenaline - also knows as epinephrine - into the bloodstream which circulates through the body making your heart race, increases blood pressure, pulse and breathing (NHS, 2022; LeWine, 2023).
The extra oxygen produced by breathing faster sends the body into a state of alertness, therefore, making your senses sharper.

When the adrenaline is triggered, it also releases glucose (sugar) and fats from temporary storage areas in the body and these nutrients access the bloodstream, supplying energy to all parts of the body. This stage happens so quickly and efficiently that the process already starts before the brains visual centres have the chance to process the dangers that are happening (LeWine, 2023).

As the first surge of adrenaline subsides, the hypothalamus activates the second component of the stress response system called the HPA axis which consists of the hypothalamus, the pituitary gland and the adrenal glands. The HPA axis keeps the sympathetic nervous system "pressed down" by relying on a series of hormone signals. If the brain still perceives a threat, the hypothalamus releases corticotropin-releasing hormone (CRH) to the pituitary gland which in turn releases adrenocorticotropic hormone that travels to the adrenal gland so that it releases cortisol. This helps the body stay alert and hyper vigilant until the threat dissipates and cortisol levels decrease. Once this has happened, the parasympathetic nervous system which is also known as the "brake" alleviates the stress response
(LeWine, 2023).

Effets of stress on health and wellbeing

As previously mentioned, stress is not always negative.
In small doses it can be a motivator for people to get tasks completed or help them cope with potentially serious situations (Pietrangelo, 2023) but if it's continuous, it can become harmful and create a higher risk of developing health problems.

In a survey conducted in the UK in 2024, it stated that one in five people experience stress daily (Forth, 2024). This is often associated with the feeling of losing control over something and can be caused by several factors such as family and relationship difficulties, financial worries, housing issues, health problems including illnesses or bereavement, work or educational pressures (NHS, 2022; Mind, 2022).

A study looking at stress amongst age groups states, 29.3% of 16 to 24-year-olds experience stress daily and roughly 20.5% for both 25 - 34 and 34 - 44-year-olds. When these demographics were asked how many of them experienced this weekly it significantly increased to 74% or more (Ciphr, 2021; Forth, 2024). Thus, suggesting that young adults are more likely to deal with stress regularly.

Dr Thom Phillips works in NHS general practice and states that "stress is an issue for anyone of any age but I find it particularly worrying that daily stress affects so many young people. If this is something they are never able to escape, then it's a potential that their entire adult life will be in a state of elevated stress which could have some serious physical health impacts." (Forth, 2024)
Furthermore, Dr Philips highlights the severity of stress, not only in adults but young people and the lack of awareness surrounding this issue.

Chronic stress causes a higher level of cortisol which is a steroid hormone (Santos-Longhurst, 2022) that affects all the parts of your body whether that be your mood, immune and digestive system or cardiovascular health. More noticeable symptoms of chronic stress include; headaches caused by too much tension, depression, weight gain, lack of concentration and focus, heartburn from increased stomach acid, insomnia, high blood pressure, missed periods due to fluctuating hormones, low sex drive from fatigue and shortness of breath from the throat muscles tensing up (Pietrangelo, 2023). Theses symptoms may not initially seem dangerous but can in fact cause more severe consequences later in life, if not managed.

A person is more at risk of a heart attack and / or stroke due to the damage of their arteries from increased heart rate and high blood pressure, type 2 diabetes from the increased level of glucose (sugar), fertility problems for both men and women making it harder for them to conceive and with the changes in the way food moves through the body, a person is more susceptible to nausea, vomiting, constipation and di-arrhoea. This clearly highlights the negative effects of stress hormones and how they can reduce the bodies response to foreign bodies, making a person more vulnerable to a common cold, viral illnesses and infections which prolongs healing times (Pietrangelo, 2023).

Stress reducing methods that are considered 'typical'

As recommended by the NHS on their '10 stress busters' page, to summarise, the best way to manage stress is being active, taking control of your life, connect with people, get help and be more positive (National Health Service, 2021; NHS, 2022).

This advice is for everyone - not a specific age group - and highlights some of the 'typical' methods of reducing stress but not how these methods can positively impact our health or how effective they are, nor do they provide information about where someone could go to receive help or start their journey of managing stress. After looking deeper into how beneficial these 'methods' are, the 3 key methods that evoke a positive change in our well being are the following:

Firstly, one of the most popular and effective methods is exercise and implementing physical activity into our daily or weekly routine (Kubala and Jennings, 2018; Mayo Clinic Staff, 2021; NHS 2022) This has shown to significantly impact our body, reduce stress levels and improve our overall mood. A 6-week study of 185 university students found that aerobic exercise at least twice a week have not only reduced perceived stress but also improved self reported depression, anxiety and have created a positive element into our lifestyles. It is recommended that if a person is currently inactive, it's best to start with gentle exercises that you enjoy such as walking or cycling or exercise for shorter intervals as it increases the likely hood of sticking to the routine as well as building up your tolerance (Kubala and Jennings, 2018).

Secondly, being chronically stressed may lead to overeating which creates a higher chance of consuming processed foods, impacting our mood and physical health. Staying hydrated and eating a balanced diet of nutrient dense whole foods like fruit, vegetables and fish can decrease the risks of deficiencies such as lack of Vitamin B and magnesium. Whole foods ensure our bodies are properly nourished and therefore regulate our stress levels and overall mood.
(Kubala and Jennings, 2018)

Lastly, making time for self care is important as it minimises the risk of burnouts from too much stress or pressure and instead increases our energy (Kubala and Jennings, 2018). This simply means making sure to set aside time to do something that makes you happy or improves your mental state. This can include spending time with family or friends, journaling as it is a positive outlet for thoughts and emotions, making sure that you're getting enough sleep which should be around 7 to 9 hours for adults (Kubala and Jennings, 2018, Mayo Clinic Staff 2021) or listening to music as it distracts the mind which in turn reduces blood flow to the amygdala and lowers the production of cortisol and increases our dopamine levels (Mary , 2020). Furthermore, these 'typical' methods of managing stress are helpful when knowing what the cause is and when implemented into your routine improves well-being and more importantly, our quality of life. But how do we design the built environment to reduce stress in the subconscious mind?

These methods all take on physical attributes, suggesting that how we prevent or reduce stress is by 'doing'. This insight suggests that designing a space which represents movement and creates a flowing atmosphere would help ease stress.

What is NeuroArchitecture and who discovered it?

Sustainable and green built design has become the forefront of Architecture, prioritising a cleaner and healthier economy and environment. But why has designing to improve wellbeing been disregarded and seen as less important? (Medhat Assem, Mohamed Khodeir and Fathy, 2023). This is where NeuroArchitecture comes into play.This term is a combination of neuroscience - a study of how we function

function as individuals, how the nervous system develops and the structural integrity of the brain – and architecture (The United Workplace, 2019; Nordqvist, 2013).

The focus on the brain, helps architects understand people's behaviours and cognitive functions so that they can design with the intent to improve one's wellbeing, not hinder it. So, the term NeuroArchitecture is defined as "any built environment which has been designed from principles derived from neuroscience" and reveals the public health implications of the built environment (The United Workplace, 2019; Valentine and Mitcheltree, 2024). Traditionally, the understanding of how architectural design affects our body was based on the transmission of communicable diseases and viruses. An example of this was when architects had to redesign UK tenements postwar due to overcrowding, damp and poor ventilation as it was a breeding ground for deadly infectious diseases like tuberculosis (Valentine and Mitcheltree, 2024).

Dr Jonas Salk, an American virologist and medical researcher was first to discover a link between cognitive performance and architecture. Whilst perusing a cure for the polio vaccine, he spent most of his time in a dark, basement laboratory at the University of Pittsburgh but after years of trial and error, still not finding it, he decided to travel to Assisi, Italy. From there, he continued his work at the Basilica of San Francesco d'Assisi, a 13th century light-filled monastery with gothic arches and columns. It was there he found the solution to create the polio vaccine and credited the Basilica's design for igniting his cognitive abilities. He stated that "The spirituality of the architecture there was so inspiring that he was able to do intuitive thinking far beyond what he had done in the past." (Elliott, 2022; Connections by Finsa, 2019) After his success, he was so fascinated by the power of architecture to inspire and stimulate, that he worked with architect Louis I. Kahn to create the Salk Institute. This research centre uses its design to inspire people when working on their scientific pursuits (Matoso, 2022; Marando, 2024; Elliott, 2022).

In following years, many other scientists discovered the connections between wellbeing and the built environment, including Fred Gage. Gage officially named the discipline NeuroArchitecture in 2003 after speaking at the AIA National Convention (Marando, 2024). He was also a researcher at Salk Institute and further investigated the connection between human biology and the built environment. He agreed with Salk's discovery and believed that "while the brain controls our behaviour and genes control the blueprint for the design and structure of the brain, the environment can modulate the function of genes and, ultimately, the structure of our brain, and therefore they change our behaviour. In planning the environments in which we live, architectural design changes our brain and behaviour." (The United Workplace, 2019). This suggests that a key aspect in creating a NeuroArchitectural space should be to design with the intent to inspire and promote productivity. Therefore, when designing a space for young adults, it would be beneficial to find out what features motivate them and encourages them to be innovative.

Key elements of Neuroarchitecture

We spend at least 80-90% of our time indoors (Colonial, 2020) and can subconsciously trigger the process in our brain that makes us feel stressed by such things as noise pollution, neon signs, patterned tiles or specific colours and materials (Valentine and Mitcheltree, 2024).

The constant exposure actively contributes to the increase in stress hormones produced which inevitably creates a higher risk of developing “so called non communicable diseases, also known as lifestyle diseases. These include neurodegenerative and psychiatric conditions such as Alzheimer’s, Parkinson’s disease, depression and anxiety. These issues can be more prevalent in urban areas due to pollution, reduced social cohesion and increased stress associated with urban living.” (The United Workplace, 2019) So, to create NeuroArchitecture that benefits our wellbeing, there are fundamental requirements that should be followed which has been provided by The Academy of Neurosciences for Architecture (The United Workplace, 2019).

1 - Sensory Perception
Perception uses multiple senses which involve memory, emotions and experiences of sensory organs. It impacts behaviour and imagination as well as the way new information is processed or how they react to the space.

2 – Routes
In any space, points of reference and routes are two key elements that define both form and function whilst helping signify spatial perception. Spaces which encourage and foster free exploration are more likely to improve personal experiences due to the lack of informed routes.

3 – Learning and Memory
Spatial memory requires visual cues to establish our location and orientation within any environment. This is necessary as when these are missing, our stress response is activated due to the delay in our brains computing where we are. Thus, highlighting the significance of design elements that support spatial recognition and recall.
4 – Emotions
When entering a built environment, it is initially perceived through emotion. This system has been provided by evolution to determine good from bad, safe from dangerous and so on, in order to survive. Due to this quick and efficient system, judgment has already been passed before our sensations have fully comprehended our surroundings. This could be on the materials used, spatial relations, proportions, scale, rhythms or comfort level. The emotional responses include areas of the brain related to bodily movements and our autonomic nervous system which regulates homeostasis, also known as a state of balance among all our body systems needed for survival and to function correctly (National Cancer Institute, 2011).
5 – Space and Place
Places are mostly associated with spatial environments, the notion of “place” usually differs from that of “space” in one crucial aspect: an individual’s interaction. The internal representation of a place can be deeply informed by the way people move through it. For example, a glass partition obstructs movement but not viewing. It can be enough for the brain to perceive two physically adjacent spaces as different. This suggests that sense of place is built through movement and the spatial connections that can be made, together with one’s personal spatial configuration.
To make sure these fundamental elements are met, it is important to incorporate; natural light, high ceilings if possible, outside views, quiet

and noisy areas, biophilic design, calming colours, curved edges, mindful materials / textures and open spaces (The United Workplace, 2019; Connections by Finsa, 2019; Rockfon, 2023; National Design Academy, 2024). Furthermore, by following these 5 key elements, designers will be able to create spaces which benefit memory, promote thinking, improve cognitive capacity, mental stimulation, mood and behaviours, while simultaneously reducing stress levels (The United Workplace, 2019; Connections by Finsa, 2019).

Architects opinions on NeuroArchitecture

Fiona Beenkens is an architect who focuses on wellbeing and is the founder of BetterAtHome. Her mission is to "help people understand and realise the impact the environment (architecture) has on your energy, mood, sleep and overall fulfilment" which aligns with the goals of NeuroArchitecture (Beenkens, 2016). In her Ted Talk, she spoke about how her struggles of wanting to become an architect caused her to have a burnout at 19 years old. She said that "her dreams turned into a nightmare due to constant stress, negativity and criticism."
When trying to figure out how to reduce her stress, she became obsessed with mindfulness and how the brain worked that she considered becoming a neuroscientist or psychologist. Instead of choosing one discipline, she combined both architecture and wellbeing. Her goal was to prove that design influences wellbeing which she indeed does everyday. When designing spaces, she does so for both the conscious and unconscious mind. She states that designing for the conscious mind, is designing to feel safe which can be seen through many elements like roofs, walls and double-glazing windows. To design for the unconscious mind, architects need to follow 3 pillars; organise space differently, use colour consciously and leave ego behind.
An example she gives is about how your conscious mind may feel safe in an open space as you can see everything whereas your unconscious mind wouldn't as whenever something can happen behind you, it puts you in alert mode. The unconscious mind would instead feel safer having a wall behind them as it gives a sense of control as it can see who enters and exits the space.

Overall, Beenkens suggests that instead of designing to win prizes and thinking the more mind blowing the project is, means it's more successful, architects should be focussing on "designing with the mind in mind." Architects are aware of their responsibility to heal the planet by using sustainable materials but are forgetting the mind. Therefore, it is clear that Beenkens thinks NeuroArchitecture creates a positive impact on wellbeing and if "we want to heal the planet, we need to heal ourselves first." (Tedx Talks, 2024) Other architects such as Michael Murphy and Manuel R. Moriche agree that NeuroArchitecture has a positive impact on life, people and wellbeing as well as allowing people to heal (Murphy, 2016; Drumelia Real Estate, 2023).

This research helped gain an understanding about how architecture and stress affects all age groups but how can we use this data to specifically help young adults and form a space to have a positive affect on their wellbeing?

03 METHODOLOGY

The purpose of this report is to identify the causes of stress that young adults experience in the current climate and how the built environment contributes to their health, so that I can design a space using the key elements of NeuroArchitecture to improve young adult's wellbeing and inspire them to improve their quality of life. This will allow young adults to have a recreational space dedicated for them to meet new people, stimulate their minds and learn coping mechanisms.
To do this, I will carry out two qualitative research methods that engage with the 18 – 25 year old demographic which will not be gender specific. I have chosen this specific user group as it is a crucial and important stage of their lives. This is when teenagers turn into young adults, leaving the comfort of their home or school environment behind and start to decide what they want their future to look like, whether that's continuing their education at university, starting an apprenticeship, finding a full-time job, moving away from home or traveling around the world. Being part of this demographic myself, I have found that an overwhelming amount of stress and pressure is created at this stage with the lack of resources, guidance and facilities.

The first method I will be using is interviews, more specifically, semi-structured interviews. I will be conducting these because they are one of the most effective methods to carry out when researching as it allows the interviewer to have an open-ended conversation with the participants, explain the topic more clearly, gain a deeper understanding of the participants views and further explore their opinions and experiences (Virginia Tech, 2018). As it is semi-structured, it allows more flexibility to ask further questions or probe for additional information due to a more relaxed atmosphere being created. As it'll be in person or over a video or phone call, it will also allow me to get more honest answers and see their reactions to specific questions. There will be a minimum of 3 interviews which will be held wherever the participant feels most comfortable and at a time that is the most convenient for both parties. They will be from any of the following locations, Prestwick, Glasgow or Edinburgh. The interviews will last approximately 10-25 minutes and be voice recorded if given permission.

The second method will be a survey. I have chosen to use this as it gives participants the opportunity to share their thoughts and experiences anonymously without having to feel pressured or anxious from being watched/ interviewed. The survey will be a valuable part of my research as it can reach a wider range of my chosen demographic and can answer a series of questions that come in different formats such as open ended or multiple choice (Survey Monkey, n.d.). The survey will be available as a link and will be shared with young adults through, email, message and social media.

All participants for both the interviews and survey will be issued with a participant consent form and will be required be filled out and accepted before these research methods are carried out.
By conducting this research, it will provide me with first hand knowledge allowing me to better understand their views so that I can create meaningful design for young adults. I feel that focusing on this demographic will give them a better chance of learning and developing life skills for the next stage of their life and will also positively impact their brain, physical and emotional health.

04 PRIMARY RESEARCH

Survey Findings

A qualitative survey was conducted using Google Forms which was available to over 100 people as a link. This was sent to 18 – 25 year olds via direct messages, email and social media, to which there were 47 out of 48 respondents that completed the survey. To get a general understanding of how young adults experienced stress, participants were asked a few questions to which 100% answered that they had experienced stress before but differed in severity (Fig 1). The majority felt that it ranged from mild to severe with 55.3% saying that they dealt with it weekly. When asked how long it lasted a day, 44.4% said it lasted between 2 – 3 hours and in some cases lasted 4 -5 or even longer. As far as the participants knowledge of stress goes, most had a basic understating of how it feels but not the affects it can have on wellbeing. When asked how stress impacted their daily lives, most if not all stated that it affected their relationships. This was due to stress becoming overwhelming causing a change in personality. Most participants felt as the stress built up, they became easily irritable and agitated, leading them to snap and cause unnecessary arguments, even if someone was trying to help. A common theme with stress in young adults shows a link with anxiety, making it harder to complete tasks due to concentration issues, procrastination and lacking motivation. Most participants said that they feel comfortable talking about stress with others, however, are selective on who they share with as they don't want to feel judged.

The main causes of stress for young adults is education, social pressures and money worries (Fig 2). Most participants in the survey are currently in or have attended university and feel with the workload, they don't have time for themselves or others. The pressure of wanting to succeed takes a toll on their health and due to this anxiety they end up doubting their choice to be in full-time education which leads to worrying about

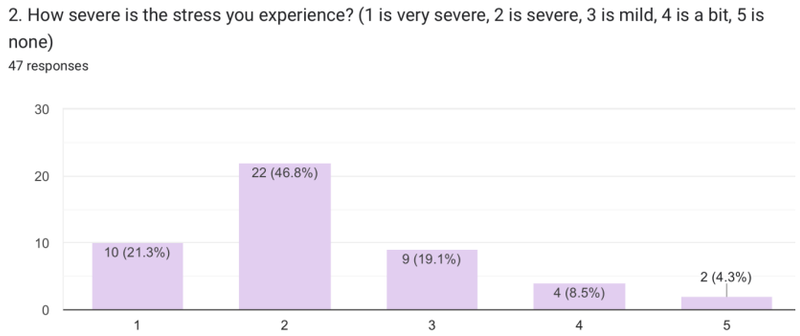

Figure 1

the future. One participant states **"I think the pressure of finding a lifestyle causes stress (through jobs, education etc) as it will need to support you financially through life. You can't do anything or live comfortably without money, and that's a stressful realisation when you are the one responsible for ensuring you are supported."**
Another participant says **"Trying to please everyone, always tying to do your best and it not being enough"** causes stress due to the social pressures of this demographic.

Respondents have also shared that when they feel stressed they try to reduce it by keeping themselves moving, this could be activities, reading or pursuing creative hobbies. One participant said that **"the rhythm of walking relaxes them and allows them to think without spiralling."** Participants also agree that exercise helps them reduce stress whether that's going to the gym, taking part in sports or yoga.

The most popular and helpful coping mechanism is listening to music

When asked if they felt there was enough support for young adults to help them with their next stage if life or how to deal with stress, 63.8% said no and 23.4% were unsure. Participants suggested that how to manage finances, learning life skills and **“anything related to being an adult without their family’s guidance would be beneficial for their age group.”** They also said that not knowing these skills or having this information, adds to the stress of achieving their goals and feel like they lack independence.
The next questions were design specific. When asked if there were enough spaces dedicated for young adults, the majority said there were no places solely for them as an age group but there were places which 18 – 25 year olds would enjoy, such as cafes, sports facilities and cinemas. They shared that having a space that didn’t revolve around drinking culture would be ideal as they felt it wasn’t the healthiest of coping mechanisms for stress but instead replicate a similar atmosphere. An example given was to create a hostel environment which included a range of different facilities such as a gym, games room, live music, classes and workshops to learn life skills and creative spaces. That being said, the participants felt that it is important to also have private and communal areas as sometimes when stressed they like to be alone but not lonely.
93.6% of participants hadn’t heard of the term NeuroArchitecture before and struggled explaining how architecture affected their mood. They were able to say how they felt in a certain space but not what characteristics of a space eased their stress unless they used the prompts given. It was prominent in the data that having only artificial light increased the risk headaches and stress or felt claustrophobic.

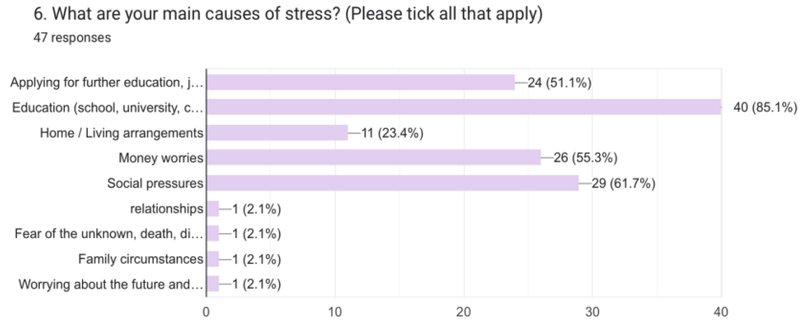

Figure 2

83% of participants said they would attend a recreational space that was solely dedicated for young adults to socialise, meet new people, stimulate their minds and learn coping mechanisms to better handle stress.

Interview Findings

6 interviews were carried out in person or through video and phone calls. 5 out of the 6 interviewees are currently in their last year of university and 1 is a graduate. The questions asked were similar to those in the survey but also discussed in more detail how architecture can inspire people and if they have felt inspired in a particular space. The reasons why this method was focused on design, was because the literature sources indicated that NeuroArchitecture should promote inspiration, so finding out what environments inspire young adults was key. The survey data also showed a lack of uncertainty when asked about how the built environments affected their wellbeing so holding

interviews allowed me to probe for further information and explain questions clearer so that participants could give a detailed and less generalised answer.
The data of the interviews showed that again, money and lack of life skills were the main causes of stress. It was continuously mentioned that being a student added to financial worries due to travel expenses, accommodation, affording food or going out with friends.
It was also mentioned that by not having the necessary skills to live alone, meant that they found it difficult to maintain a healthy lifestyle as they weren't able to cook meals or even afford healthy ingredients due to minimal knowledge in budgeting. It was also suggested that this age demographic are continuously surrounded by drinking culture which can not only have a negative effect on their bank balance but also on their physical health by not having enough sleep or managing the stress that already exists. When asked about what they feel the differences between the stress in their generation and older generations were, the overall consensus was the cost of living and the advancement of technology has drastically increased.
It was also highlighted that the interviewees felt a lack of support when leaving secondary school as they felt pressured into having to attend university as there were no other options. One participant said that **"we weren't told enough, especially when leaving school. They just said go to uni or do an apprenticeship but not how to actually live. We never got taught how to get a house, do taxes or control our money. It was more like have this university application and off you go."**
It was agreed by other interviewees that the minimal to no life skills have made them feel unprepared for the 'real' world and are left feeling stressed as they have to find these skills out by word of mouth which is unreliable.
When asked about what places inspires them, there were very mixed answers. Some of the participants felt that it was difficult to answer as there wasn't a particular space for them but instead it was a feeling. A **participant said that "I guess there's a lot of people that go and study in coffee shops as they feel more productive but I think that's generally the environment and energy within the space rather than the space itself."** This suggests that to be inspired and feel less stress, it's important to surround yourself with a different atmosphere. For example, if university is causing stress, taking yourself out of that environment and going somewhere new with a different energy will promote productivity.
Others suggested that libraries were a great space to encourage inspiration. The most common feature mentioned was having big windows that allowed natural light instead of artificial and clinical lighting. The environment created in a library also sparked others to be productive as it was quieter and had limited distractions due to the layout of the space by having communal and private areas. It was also said that **"walking into a square box is uninspiring but something that has history or meaning behind it makes me feel inspired."** It was also said that being cautious of colours and materials was important as to create a thought provoking or inspirational place you don't want it to feel like a GP centre or educational space as these are places that are associated with stress. Using warm and neutral tones was said to create a cosier and more welcoming environment. This shows the importance of using the elements of NeuroArchitecture as it's based on designing with the intent to help wellbeing which creates meaningful design.
A participant also shared that travelling made them feel inspired as you're taken out your natural environment and given the opportunity to experience new cultures and ways of life. This suggested designing a space welcoming to them and travellers would give the opportunity to meet others as well as feel inspired by learning something new.

05 DISCUSSION

Limitations

Whilst there was a vast amount of data collected, there was also limitations on what could be carried out in the short amount of time given to conduct and analyse both the survey and interviews. This led to a limited number in participants as well as who was available to take part in the interviews. Although the research was aimed at young adults, if given more time, it would have been valuable to explore older age groups, doctors and architects experiences with stress and NeuroArchitecture. This could have provided a deeper insight into how stress has changed, why it is more prominent nowadays and why previously designing for wellbeing hasn't been at the forefront of architecture or interior design. Another method that would have been beneficial to carry out, would have been taking part in 'typical' activities or methods that participants use to reduce stress. This could have helped gain first hand knowledge on how effective they were and how it could be incorporated into the design of a space.

Insights

However, based on these limits, it is clear that even though young adults experience stress frequently, they have minimal knowledge when it comes to understanding stress, the repercussions on their health and how the built environment can contribute to this. This comes down to a lack of education and facilities provided for this specific demographic. The lack of education not only in life skills but how they can manage stress in a healthy way.
There are clear indications in the primary data that show participants know they need to learn these skills but as there is nowhere to facilitate them, they find it hard to become independent and feel like they are subject to staying in environments that cause them these stresses to begin with. These were highlighted as educational institutions, workplaces, spaces surrounding alcohol and sometimes home life. Another big stressor for young adults is money which again boils down to not knowing key life skills such as learning about taxes, mortgages, how to open bank accounts, how to save and how to budget. The constant worry about money leads them to feel guilty about spending, so to combat this, they end up **"canceling plans and sabotaging relationships."** Most participants also suggested that there is **"probably help out there for life skills"** but as it is mostly online it tends to be less reliable than an in-person class or workshops. Therefore, this gap in knowledge causes young adults to miss out on life experiences, leaving them feeling overwhelmed with stress and ultimately has a negative impact on their physical and mental health.

When the participants were asked about how interior spaces affect their wellbeing, most people agreed that spaces affected their mood but couldn't identify specific design features unless prompted or were a design student themselves. Even with examples, the responses were vague and therefore highlighted the importance of designing for the mind as it subconsciously takes a toll on a person's emotions, brain and health without them knowing. Participants also stated that to help them reduce stress, they need to be doing something physical.
Most people said that keeping active, listening to music, picking up a new hobby or reading helps their mind relax. Thus, showing the importance of designing a space which encourages movement.

Existing NeuroArchitecture

The only architecture which promotes wellbeing and have used the key elements of NeuroArchitecture are outwith the UK and are either workplaces or hospitals and medical centres (Arch Daily, n.d). An

example of this is the Amazon Spheres in Seattle, United States (See Fig 3). This was built by architects NBBJ in 2018 and was designed as a hybrid greenhouse and workspace for Amazon employees to collaborate and innovate. (Pintos, 2019; Sarah Anne Lloyd, 2018)

Design Recommendations and Conclusion

Based on this, I recommend designing a sociable space for young adults that is not only affordable and gives them employment opportunities but also inspires them to improve their wellbeing. It should include all the facilities needed for them to relax, meet new people, learn life skills and healthy ways to cope with stress. The space should prioritise their wellbeing and overall health by using the key principles of NeuroArchitecture. This will include being cautious of triggering architectural features such as artificial light, patterns, colours, and textures. Lastly, the space should be designed to create a safe environment where young adults don't feel judged, with hope that all the tools provided will help them feel confident to take the next step into 'adult life.' This should create a sense of community and build a positive atmosphere.

To conclude, after exploring the causes of stress and the role architecture plays in our lives, it is clear that stress affects everyone's lives but is more prevalent in young adults. This is due to the expectations which comes at this stage in life and inevitably contributes negatively to their health. Young adults are constantly faced with an overwhelming amount of pressure to succeed in being independent but is near impossible without having the basic life skills or facilities to help them. Furthermore, it is the responsibility of designers to design with well-being in mind and limit the exposure to stress inducing environments.

Fig 3 - https://www.archdaily.com/920029/amazon-spheres-nbbj

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