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Getting more children walking and cycling to school: insights from parents in three Australian cities

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Abstract

The number of children walking or cycling to school in Australia has significantly decreased since the 1970s, while the number transported by car has steadily increased. This is affecting children's level of physical activity and associated mental health. One of the key factors affecting the changing travel mode choice to school is the parental fear of traffic danger. This research investigates parental concerns about their children's journeys to school using qualitative surveys in three cities in Australia: Canberra, Melbourne and Sydney. The narrative inquiry method guides the understanding of the main concerns of parents regarding the circumstances of routes to school, conditions of pedestrian and cycling paths and traffic around schools. The findings show that most parents worry about the lack of separation between cycle paths and lanes and motorised traffic, particularly those with higher speed limits. Parents concerned about safety around schools drive more, making the streets in school zones even less safe for walking or cycling. We discuss how reducing the speed of motorised traffic in residential streets will improve the traffic safety of children walking or cycling to school, as well as improve the community surveillance that could reduce concerns about stranger danger. The paper concludes with a discussion of the relationships between: restricted speed on community streets; the perceived safety of children's travel to school; children's involvement in outdoor activities; and the mental and physical health of children.

1. Introduction

The number of children walking or cycling to school in Australia has significantly decreased since the 1970s, while the number transported by car has steadily increased (Giles-Corti et al., 2009). This has been linked to a steady increase in the rate of car use. More parents are making the decision to drive their children to and from school, rather than have them use an active travel mode such as walking or cycling. This has resulted in a decline in physical activity levels of children and young adults, leading to adverse mental and physical health outcomes (Carlin et al., 1997, Veitch et al., 2006). One of the key factors affecting the changing travel mode choice to school in Australia is the parental fear of traffic danger as well as the fear of unwanted interactions with members of society or 'stranger danger' (Carver et al., 2008, Giles-Corti et al., 2011, Hume et al., 2009, Wati and Tranter, 2015). This research investigates parental concerns about their children's journeys to school using qualitative surveys in three cities in Australia: Canberra, Melbourne and Sydney. The narrative inquiry method (Connelly and Clandinin, 1990) guides the understanding of the main concerns of parents regarding the circumstances of routes to school, conditions of pedestrian and cycling paths and traffic around schools. We discuss how reducing the speed

of motorised traffic in residential streets will make a difference to the traffic safety of children walking or cycling to school, as well as improve the community surveillance that could reduce concerns about stranger danger. This paper is organised as follows. The next section reviews the literature on the independent mobility of children and safety concerns of children's travel, followed by section 3, which describes the research method and data analysis. Section 4 shows the results and the paper is concluded with a discussion of the relationships between: restricted speed on community streets; the perceived safety of children's travel to school; children's involvement in outdoor activities; and the mental and physical health of children.

2. Independent mobility of children and safety concerns

Independent mobility is important for children's development on a personal, intellectual and psychological level, whereby 'active exploration' allows them to experience their neighbourhood and community (Tranter and Sharpe, 2008). Increasing levels of the 'backseat generation' (Carver et al., 2008, Karsten, 2005) amongst children in modern western societies results in children missing the opportunity to explore and interact with community members within their local environment. Parents themselves can benefit from an increase in their children's level of independent mobility. Benefits for parents include the reduction in costs of escorting children, time and money savings from less time spent in congestion, as well as savings on fossil fuel energy use and reduced pollution. However, despite these benefits, independent mobility for children in many nations continues to decline. Active play and physical activity increasingly occur under adult supervision, either within the bounds of the family home or at organised events. Associated with this, when compared to previous generations, children spend less time playing outdoors and have lower levels of participation in active transport (Carver et al., 2008, De Meester et al., 2013, Easton and Ferrari, 2015, Evers et al., 2014, Tranter, 2016).

Increasingly children are being chauffeured to and from home and destinations such as school and organised sports rather than engaging in active transport as was done by previous generations (Carver et al., 2008). For example, a study conducted in Australia that investigated the trends in children's physical activity and weight status found that between the 16 year period of 1985 to 2001 the proportion of children aged between 9 to 13 years who walked to school had declined by approximately 50%. Moreover the proportion of this age group who cycled to school at least once per week had declined by 77% (Salmon et al., 2005). A similar study undertaken in the United Kingdom over a 19 year period from 1971 to 1990 uncovered a 25% decline in children walking to school (Hillman et al., 1990). A 2013 study showed that in England between 1900 and 2010 more children were accompanied on the journey to school (Shaw et al., 2013). A recent Australian investigation of data from five cross-sectional studies between 1991 and 2012 indicated a steady decline in the number of children travelling home from school alone, from 68% in 1991 to 31% in 2012 (Schoeppe et al., 2016). These studies provide evidence of the decline in active and independent transport modes to school across the globe from the 1970s. Children who walk or cycle to school are overall more physically active and socially connected than those who are driven, as the activities lead to additional opportunities for the child to socialise, play outdoors and to exercise (Cooper et al., 2003, Sallis et al., 2004). Research has also found that children who partake in unsupervised play have a higher degree of cognitive skills than those who do not partake (Huttenmoser, 1995).

Two important factors affecting children's independent mobility are parents' concerns about children's road safety as well as their fears about stranger danger within the city and neighbourhood. These concerns lead parents to restrict outdoor play and active transport within their child's everyday routine (Carver et al., 2008, De Meester et al., 2013, de Vaus and Wise, 1996, Evers et al., 2014, Giles-Corti et al., 2009, Veitch et al., 2006). Positive associations are evident between physical activity and the level of pedestrian safety, and the presence and accessibility of public transport facilities within the community (Carver et al.,

2008). Conversely, there are negative associations between children's physical activity, traffic volume and local crime rates (Davison and Lawson, 2006). Understanding parental concerns involves the consideration of many diverse components such as stranger danger, personal injury, road safety and bullying (Carver et al., 2008). However the literature, including contributions from Australia, indicates that the key fears of parents concern road safety and stranger danger (Giles-Corti et al., 2011, Hillman et al., 1990, Hume et al., 2009, Matthews, 1995, Mullan, 2003, Valentine, 1997). It should be noted that gender is also another factor that is associated with children's journeys to school. Significantly fewer girls are travelling independently than boys (Carver et al., 2005, Schoeppe et al., 2016). Built environment factors have also been shown to have some influence, with children more likely to walk to school in higher density neighbourhoods (Humbert et al., 2006, Klesges et al., 1990, McLaren, 2016, Sallis et al., 1993, Stewart, 2011).

Research suggests that when parents reference their own childhoods they believe that children in present day society are faced with more risks, especially from traffic and strangers (Carver et al., 2008, Valentine, 1997). Within the available literature 'stranger danger' appears to be a highly significant factor influencing the level of independence of children in modern society, which includes unwelcomed approaches from strangers and assault (Carver et al., 2008, Evers et al., 2014, Lilja et al., 2001, Timperio et al., 2004, Veitch et al., 2006). Age of children affects how parents feel about stranger danger - parents of younger children are more concerned about stranger danger than parents of older children (Hume et al., 2009). An Australian study conducted in 2004 found that stranger danger was of key concern to 81% of parents of children ages 10 – 12 years, and 88% of parents aged 5 – 6 years (Timperio et al., 2004). This study highlighted a 'risk-victimisation paradox' that is present when stranger danger and its associated risks are exaggerated. Furthermore, a 2006 study found that 58% of parents had safety concerns relating to strangers, where parents reported that they did not feel comfortable to let their children play in the street due to a perceived risk of stranger danger (Veitch et al., 2006), even if the actual risks from strangers is low.

In contrast to stranger danger, research on children's involvement in road traffic crashes show validity of parental concerns about traffic danger (Malone, 2007). Similarly, in the United Kingdom over 60% of road related injuries occurred within 500 metres of the victim's home (Petch and Henson, 2000). UNICEF in 2001 exposed transport accidents as the leading cause of death and injury among 1 to 14 year olds across developed countries (Towner and Towner, 2001). Parental fear of traffic surrounding schools during drop-off and pick up times, high vehicle speeds (Svenson et al., 2012) and the lack of separation between lanes for motorised traffic and cycle or pedestrian paths also affect children's independent mobility. Two Australian studies conducted in 2004 and 2005 found that the perception of unsafe road environments by parents was negatively associated with the walking and cycling rates of children aged 10 – 12 years old (Carver et al., 2008, Timperio et al., 2004). Also, a study in the United States found that 70% of parents restricted outdoor play venues for their children due to supposed unsafe cars and trucks within the area (Gielen et al., 2004). A study by Weir et al. (2006) concludes that inner-city parents held more concern compared to suburban parents when traffic volume was considered. In their study 60% of inner-city parents, compared to 27% of suburban parents believed that traffic volume in their neighbourhood was too high for their children to safely play outdoors.

From the literature, it is understood that parents are responding to traffic danger and road safety fears by restricting the independent mobility of their children. Increasingly parents feel the need to escort their children whenever they travel beyond what they perceive as a safe zone. These are examples of defensive and avoidance behaviour by the parent. This, combined with the complex nature of modern day family routines, is increasing the dependency on motorised travel, leading to lower levels of active travel, with associated negative health outcomes. Furthermore road safety concerns lead to less outdoor play as well as lower levels of cycling and walking amongst children. This research further advances

the understanding of the contextual factors affecting children's active transport and safety concerns in three Australian capital cities.

3. Method

3.1. Data collection and analysis

A qualitative research method, which is the most effective methodology for generating in-depth insights into social attitudes (Creswell, 2013, Greig et al., 2009) was adopted. Participants were recruited through 'purposive' and 'snowballing' techniques to represent a range of ages of children (between 1 and 18), demographics (both parents working full-time, one parent working full-time and one part time, one parent working full time and one at home, etc.) and geographic locations (inner and outer suburbs) considering different neighbourhood characteristics (such as availability of pedestrian/cycling paths, urban form, socio-economic characteristics of neighbourhoods). Participants were sourced from the social and professional network of the researchers and participants. As a result, 99 interviews were conducted across the three cities (Sydney: 24; Canberra: 57; Melbourne: 18). Qualitative semi-structured interviews were undertaken. The questions included those related to the participant's family structure, the location of their home, employment status and work location, age of their children, car ownership and transport use, weekday and weekend schedules, and their priorities in decision-making (see Appendix). Each interview lasted between approximately fifteen and thirty minutes. Interview recordings were transcribed verbatim. Each transcript was read several times to develop a full understanding of the context of each individual and the range of nuances in the responses. The interview raw data were translated into meaningful explanatory codes recurring across interviews (Lee et al., 2005). The coding was done by using qualitative analysis software NVivo 10 and further refined several times through repeated inspection (Gardner and Abraham, 2007, Schwanen, 2008). This involved re-reading a sample of the transcripts and identifying the emergent topics, which were then clustered together and given an alphabetised code (Tesch, 2013). This code was then applied to analyse each of the 99 transcripts. The relevant data for each coded topic was then collated, and forms the basis of the following analysis and findings, with three major themes described in section 4 emerging as significant factors affecting children's transport.

The characteristics of each city should be noted. Sydney is the largest city in Australia with a population of 4.7 million, followed by Melbourne with 4.3 million. Canberra is considerably smaller with a population of 390,000. Sydney and Melbourne are both characterised by a dense inner-city core surrounded by significant suburban sprawl. Canberra is a poly-centric, planned city described by a series of partially self-contained towns, each with their own town centres with high order retail and significant office employment. In all three cities cars provide the main transport mode. Public transport use is higher in Sydney and Melbourne than Canberra.

3.2. Characteristics of participants

Table 1 portrays the characteristics of participants, including aspects such as number of children and car ownership across the participants from Sydney, Canberra and Melbourne.

Table 1: Characteristics of participants

Number of children	Sydney	Canberra	Melbourne
1	54.2%	31.6%	38.9%
2	41.7%	52.6%	22.2%
3	4.2%	8.9%	27.8%
4	0.0%	7.0%	5.6%
5	0.0%)	0.0%	5.6%

Age of children described in interview			
1-4 years old	23 (47.9%)	39 (38.6%)	21 (52.5%)
5-9 years old	14 (29.2%)	26 (25.7%)	15 (37.5%)
10-14 years old	7 (14.6%)	24 (23.8%)	2 (5.0%)
above 16 years old	4 (8.3%)	12 (11.9%)	2 (5.0%)
Car ownership			
0	8.0%	0.0%	0.0%
1	46.2%	35.7%	33.3%
2	38.5%	55.4%	61.1%
3+	0.0%	5.4%	5.6%
Motorbikes and Scooters	8.0%)	3.6%	0.0%
Work status – mother			
Employed full-time	36.0%	43.1%	12.5%
Employed part-time	60.0%	45.0%	81.3%
Not employed	4.0%	11.8%	6.3%
Reported flexibility at work	40.0%	21.6%	37.5%
Work status – father			
Employed full-time	87.0%	88.9%	87.5%
Employed part-time	4.3%	8.9%	6.3%
Not employed	8.7%	2.2%	6.3%
Reported flexibility at work	34.8%	31.1%	25.0%

Notably Canberra families in the study sample have more cars per household than other cities. Mothers tend to have part-time jobs in all cities but Canberra has significant proportion of mothers working full-time[1].

4. Results

4.1. City context and children's travel modes

In Sydney, our sample shows that the main travel mode for children to and from school is travel by personal car. This occurs even when the family home is within walking distance to school and when the parents themselves use both public and active transport for their travel to work. The insights from the interviews suggested that the key factor influencing children's travel to school mode was the complex routines of families in Sydney. Also important were long working hours and long commuting times of parents (more than 60 minutes per day). The pressure resulting from time schedules of work, transport timetables and school pick up and drop-off times affect the mode choice. In addition, many parents reported that their choice of housing location depended on the availability and closeness of schools for their children. Despite this, even when the family home was within walking distance, parents still continue to drive their children each day regardless of the convenient proximity. In Melbourne, like the results for Sydney, the main transport mode to school for children was travel by car. Parents noted the level of traffic around schools during drop-off and pick up times as anxiety causing[2], and also reflected on the increase in traffic danger they have noticed since they attended school. Also discussed in Melbourne were aspects of urban planning such as the road networks around schools and the concern for safe pick up and drop-off zones for children around the school. In Canberra, although predominantly using

[1] In Canberra, 63.5% of males and 44.2% of females in the working age population (15-64 years old) are in full-time employment (national average is 59% of males and 32.8% of females are in full-time employment) and 13.8 % of males and 26.0% of females are in part-time employment (national average is 13.3% and 29.1% respectively) (Australian Bureau of Statistics, 2011). Over 75% of males and 70% of females in Canberra are employed either full-time or part-time.

[2] This point was also discussed with parents in Sydney and Canberra.

cars for children's travel, parents indicated less concern about traffic safety compared with the other two cities. Furthermore, in Canberra there is less fear amongst the parent's decision to let their children walk or ride to school and to catch public transport within the city. There were more instances of children partaking in self-guided active travel within their everyday routine and a preference from parents for this to occur. The results from Canberra when compared to Sydney and Melbourne data show more concern for the CO_2 emissions and petrol consumption, and more instances of active transport within the family's everyday routine than that represented in the data for Sydney and Melbourne. Despite the difference between the Canberra data and the Melbourne and Sydney data, there still remain underlying factors of traffic safety that are influencing the decision of parents in all cities.

4.2. Traffic safety and stranger danger

Safety in general, is indeed a main concern for parents, as a participant stated:

"*Safety is the most important thing for our kids, and we'd go and pick them up any time anywhere if we could manage it.*" (Canberra)

The fear of crossing streets and main roads, the route to school, as well as vehicle speed are found to be main factors, as well as fears about stranger danger.

"*The one school that we ended up selecting was because you could walk there quite easily and you didn't have to cross a main road. So we take sort of the back streets to get to the school, whereas the other primary school, you would have had to cross a main road and walk down a bit further.*" (Melbourne)

"*On the road, especially like Horse Park drive [it] is 80 km per hour speed, I don't see any sort of safety… personally I don't like the bicycle lane, because it's not quite safe.*" (Canberra)

"*The longer distance of travel I do worry about the safety of the children, and its traffic as well as predators. I mean look at the fences they've just put around the schools, it's heart-breaking. I hate all the fences, and I'm not sure it'll really help, but I worry about the other traffic and predators.*" (Canberra)

In addition, parents perceive the traffic around schools to be too dangerous for their children, and in turn add to the traffic by driving their children to school so they aren't exposed to it.

"*The parents drop-off the very young children by car almost all the time, the school that we go to has very poor road design near the school. It has always been crazy when school starts and finishes. They need to facilitate safe pickup and drop-off for those that use a car.*" (Melbourne)

"*I'm a bit worried you know about the safety of the kids. Because no parking, no proper parking (around school), and it's so narrow and lots of cars at peak hour. So I think that's a bit worrying.*" (Canberra)

4.3. Street designs and road facilities

Parents reported that the street design and road facilities did make difference in allowing children to travel to school alone, once they were old enough.

"*It's well-lit. The pavement is good. The traffic lights and the crossings are there for them. There's no place that they need to cross the road without it being dangerous. There's a lot of shops of people looking out onto the pavement, so I'm not worried that they're isolated or exposed or in danger or necessarily, or being hit by traffic.*" (Sydney)

Adequate pedestrian path and cycle networks around the school would make parents feel more comfortable.

"*In terms of the school transport logistics, I think having well-designed cycle paths [or connections between the school and cycle network] would be a very valuable thing because you'd give them more confidence to let their children travel by themselves.*"(Melbourne)

"*And once she's old enough we won't even need to drop her. She can just walk back home. And there's a bridge underneath to cross our street, so it'll be really safe, so that's why we have chosen [to live here].*" (Canberra)

It is not only the fears about children's safety that impact on their independent mobility. Parents can also be concerned about injury to themselves caused by traffic. Also, the travel modes of the parent and fears about active travel for themselves, are important in understanding the child's travel mode. Providing an urban form that is encouraging for adults to seek active travel opportunities, may lead to parents seeking them for their children. The analysis shows parents seeking alternatives for themselves through the provision of a safe city and community, where fears of traffic and high vehicle speeds are met with planning solutions.

"*I think that the bicycle ways and the green ways…I'm not terribly fit and I would be scared in a traffic. But if there was a bicycle way between here and the city, I would work my way up to taking it. I really would. As it is, I don't even try, because I'd get killed in that traffic. You know, I'm fully aware of that, but I would, you know like, I would do it.*" (Sydney)

Environmental concerns were also discussed in interviews but it depends on the ease of walking and cycling.

"*I'm sort of surrounded by these issues of transport and sustainable development, sustainable transport, I'd probably make more conscious efforts to actually introduce that to my family. So like, I'm aware that, for local trips at least, as much as possible, to just walk and cycle, cause it's pretty easy.*" (Canberra)

4.4. Appropriate age for independent travel

The participants had varying perceptions about the appropriate age for their children to be able to travel unaccompanied, but "above ten years old" seemed to be mutually agreed age for the participants of this study. Gender of children was also discussed at the interview, however for our participants, age of children seemed to be more significant factor associated with their independent travel.

"*They've all been really safe. They've all managed to get around, no problems. All of our kids have been doing it since they were about 11, so they, they're quite confident and efficient with it. So I don't really, have concerns [now]*" (Sydney)

"*We chose the school because it is co-ed, it's on the train line, so the kids will be able to go by themselves when they're older…. probably when they start senior school. Twelve, maybe twelve or thirteen.*" (Melbourne)

"…because (suburb name) is, you know it's a bit isolated and semi-industrial, so I don't particularly like her walking around (suburb name) when it's really quiet on weekends." (Canberra)

However many parents continue taking their children to school by car after the age of 10. An important reason for this is that after-school sports become regular activities of children and many sporting fields and facilities are not easily accessible without a car.

"*But I imagine that once the kids get old enough they'll be able to ride their own bikes to school and from school and all of that. Life will get really easy I think in that aspect. But then if its things like we've got to go across town to go to soccer training or to go to dance class or whatever it is, obviously that's going to complicate things.*" (Canberra)

5. Discussion and conclusion

This study identified the underlying contextual factors that guide parents in the decision to allow or disallow the independent mobility of children to and from school. Three themes emerged from a qualitative analysis i.e. a) traffic safety and stranger danger, b) street designs and road facilities and c) appropriate age for independent travel. The perceived safety of walking or cycling was an important issue for the participants. There was concern from parents about the lack of separation between cycle paths and lanes and those for motorised traffic, particularly those with higher speed limits. These issues have been consistently identified in other studies. Furthermore, the large number of parents driving children to school is causing a safety concern around schools, forcing parents into a "social trap": many parents believe that cars are being used unnecessarily for the journey to school, but take the extra traffic around schools as an excuse for driving their own children to school (Tranter and Pawson, 2001).

The need to incentivise and make the use of non-motorised transport modes easier for families is an important implication of the findings. With many parents expressing concerns about safety and the lack of separation between pedestrians and cyclists and fast-paced traffic lanes, reconsideration by government of how road space is shared may promote more usage of those modes, and allay parents' safety fears. The perception of fears depends on parents' own experience, which is consistent with literature (Niehues et al., 2015).

The urban form and the lifestyles of residents of Australian cities in their current state diminishes the protection of children from real and perceived dangers such as traffic and stranger danger. As parents become increasingly concerned about dangers in their children's independent mobility, the level of car use to transport children to and from school continues to increase. Subsequently this is impacting on the general health and wellbeing of children.

The research in this paper has potential for influencing policy makers, as it identifies important recommendations that are likely to increase children's independent mobility, active travel and health. In addition planners and governments should ensure that within school catchment areas there are safe routes to school. This may result from the engagement of parents within the planning process in things such as neighbourhood walkability assessments (Evers et al., 2014). Through the provision of buffers between cycling paths and the lanes of vehicle traffic, the literature shows that the anxiety levels of parents decline. The provision of physical protection mechanisms, i.e. buffers, that aim to protect children on their journey to school, contribute significantly to a reduced anxiety level. Lastly, parents' fears of high speed traffic can be met with a policy decision to decrease vehicle speeds in residential areas. As well as providing well-designed pedestrian and cycling paths within school catchments, the speed of motorised traffic also needs to be considered. Lowering the speed of traffic in residential streets, as has already occurred in large areas of many European cities (Tranter, 2016), is a necessary step in any move toward making Australian cities more child friendly. Further research into the safe speed level in neighbourhoods and the influence of traffic speed in the transport decisions of parents and children is recommended.

An important limitation of this research is that the examination of the perceptions of the parents of children may fail to address issues that the parents themselves cannot envision. For example, parents (and indeed, most citizens) rarely reflect on the way that their own decisions influence the decisions of others: they fail to appreciate the collective impact of their own individual decisions. The "social trap" discussed above is an example of this. A related issue is that many behaviours that parents engage in are deemed to be socially acceptable, or even obligatory as part of good parenting. One example of this is the way that parents feel obligated to drive their children to sporting events (or to their friends, or social activities). Future research could further investigate the pressures on parents and the social

traps associated with traffic danger around schools. There is little awareness of the way that the collective impact of “parental traffic safeguarding” (McLaren and Parusel, 2011) is likely to make children’s active travel less likely, and create more danger around school. In addition, the widespread acceptance of the idea that speeds of 50 to 60 km/h in residential streets are acceptable when driving children to school (or sport) indicates that a major cultural shift in attitudes is necessary before there can be any significant change to levels of children’s independent mobility in Australian cities.

Appendix: Interview questions

Q1. Please let us know about your current life circumstances (family structure, age of children, residential location, car ownership etc.).

Q2. Please let us know about your/your partner’s work circumstances (occupation, working hours, work location etc.).

Q3. Please let us know your household work and parenting circumstances (sharing of household work and child care, if there is any help from family or nanny etc.)

Q4. Please let us know your/your partner’s schedule on a typical weekday (excluding holidays) and travel diary (including children’s travel and possible chauffeuring of children, mode of transport, distance covered).

Q5 Please let us know your/your partner’s schedule on a typical weekend (excluding holidays) and travel diary (including children’s travel and possible chauffeuring of children, mode of transport, distance covered).

Q6. Please let us know your priorities in making decision on how, where to live and work and time use.

Q7. Did transport considerations affect your choice about where to live and how to work?

Q8. Are there any concerns about your schedule in weekday/weekend, especially in organising both your schedule and child(ren)? (for example, transport related concerns such as taking child(ren) to school, going to work, picking up child(ren) from school), time-budget concerns such as organising your work, household duties and looking after children) . How do you address these?

Q9. Do you have any suggestions for transport providers/government that might help make things easier for families? (for example, improving the school bus service, better public transport system, flexible work options/scheme etc.)

Q10. Is there anything else we need to know regarding your life, work and parenting circumstances?

Q11. Is there anybody else we should talk to?

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