
Sk8ting the sinking city

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Abstract: Hot, humid, cracking, and sinking, the Crescent City seems unlikely for skateboarding. Frequently referenced for being ‘up to no good,’ unsupervised adolescents seem an unusual candidate to create opportunities for environmental justice. The paper examines how settings afford prosocial behaviours amongst skateboarding adolescents. Young people have a unique capacity to improve settings for play. Using evidence collected from site observation and YouTube videos, sk8ters reveal that supportive places can arise from blight and vacancy. The research has broader implications for sustainability and environmental justice professionals working with vulnerable populations to transform degraded spaces into beneficial places.

Keywords: adolescents; appropriation; interdependence; play; environmental justice; cities; YouTube; affordances; New Orleans; skateboarding; settings; phenomenology; urban design; urban planning; sustainable cities.

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Biographical notes: Ben Shirtcliff, PhD is an assistant professor of landscape architecture and urban design at Iowa State University. He has dedicated the majority of his academic and professional career to understanding and improving the relationship between adolescents and the physical environment. His teachings include City Play!, environmental justice in urban environments, urban design, site planning, shaping the land, and ecological design. His specific focus is on how vulnerable populations, like young people, create unique alternatives to play out of environmental burdens in the built environment. His research advances appropriation and participation in cities as a means to successfully recover deteriorated environments.

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1 Playful grounds for environmental justice

Annually, on the 21st day of June, skateboarders take to the streets across the USA. *Go Skate Day!* has become a holiday of sorts where skaters advocate for their particular type

of play and transportation by converging on one location and then skateboarding, in mass, to another location, usually a skate park. The cross-city skate is probably the most interesting part of the event as skateboards become a visible and frustrating mode of urban transportation, interwoven through the urban setting with pedestrians, cars, and bicycles. Urban populations have had varying responses to *Go Skate Day!* In the District of Columbia, for example, police almost seem prepared for the unlicensed parade by staging an informal barricade and then chasing, grabbing, and handcuffing skaters who are, apparently, breaking the law of sufficient means to warrant physical harm from a peace keeper. In New Orleans, on the other hand, skaters are informally guided down a busy urban thoroughfare by an officer in a patrol car or motorcycle who is tasked with ensuring their safety. The two cities vary considerably from one another, with countless potential explanations for such divergent responses. The contrasted response of these two cities serves to set the stage for a study on young sk8ers moving throughout the Crescent City. The following study examined how adolescent play behaviour varied across multiple sites over the course of one year, from 2011 to 2012, six years after the levees surrounding the sinking city failed. By the end, I intend to demonstrate that a study on adolescents playing contributes to environmental justice, and to show that a playful activity, like skateboarding, can provide a window into paths to change environmental, cumulative risk.

The paper fits into a larger context of inquiry regarding whether physical and social settings in cities inadvertently encourage risk-taking behaviours. I suggest that when urban designers, planners, and policymakers restrict the places, adolescent skateboarders play and identify with that such restrictions result in limiting the identity of the place to the extremeness of the behaviour and the behaviour to the extreme limits of urban environments. Instead, I propose that allowing adolescents to appropriate settings to support play would have prosocial benefits and that these benefits would increase proportional to the extent of creative appropriation they are able to achieve in a setting. In such a case, adolescent skateboarders found *playing-in-the-world* would promote a grass-roots form of environmental justice through play, positive attachment to place, individual accomplishment, and improved social status. Such a finding would have important implications for urban planners and designers, youth advocates, and cities struggling to improve the urban conditions affecting vulnerable populations in the USA.

The paper responds to these broader outcomes in the following format:

- 1 identify that adolescents are a vulnerable population encountering multiple burdens and benefits in urban environments;
- 2 show that skateboarding is a form of play behaviour and is one of the means by which adolescents successfully engage benefits;
- 3 identify that the relationship between adolescent play behaviour and affordances of settings supports prosocial outcomes.

Skateboarding is a type of play activity—no direct economic or personal benefit—that inherently carries a certain amount of risk from falling or injury. Along with risk comes a certain amount of reward, or prosocial support, such as status and positive social reinforcement from peers. Environmental justice in an environment of cumulative risk drives my current inquiry. Observable adolescent play behaviour found in the field and on YouTube videos serves as the measurable outcome. The affordances of settings to support prosocial behaviours act as the criteria. Multiple sites (17) are compared to reveal

the tendency of settings to support risk-taking and prosocial behaviours. Settings will then be shown to support playful activity through the affordances of the physical, built, and social environment that, in turn, affect individual behaviour.

1.1 Cities aren't for teens

Adolescent “rights to the city” suffer environmental injustice by a loss of mobility and a general perception of mistrust of youth agency in urban areas. Adolescents are shown in the literature to be intentionally marginalised, oversimplified as a group instead of being a part of many subcultures, possessing limited access to decision-making regarding their environments, found to use the environment differently than adults, and to be dependent on public services more so than adults (Freeman and Riordan, 2002). Multiple studies show how space perforated by youth activity is used to generalise youth as unruly, their appropriated space as the site of resistance, and the deployment of exclusionary tactics to continue to marginalise youth so as to encode a normalised spatial identity (Robinson, 2000; Howell, 2005; Nemeth, 2006, 2004; Vivoni, 2009; Woolley and Johns, 2001; Stratford, 2002; Kelly, 2003; Flusty, 2000; Fusco, 2007). Further, the physical space within urban areas is often overdesigned and is limited by adult interest to meet youth needs (Owens, 2002). Adolescents are unable to congregate or use public spaces because they are viewed as a negative element (Owens, 1997, 2002; Kato, 2009). Following the literature, adolescents are unjustly classified as a single group and the status quo perception of adolescents as a single population limits opportunities to participate in public space.

In their study of urban policies, Rogers and Coaffee (2005) found that groups of adolescents and youthful activities make it easier to create policies that explicitly remove them from public place. The systematic exclusion of adolescents from public spaces (Rogers and Coaffee, 2005) has been shown to cause them to seek out ‘liminal’ spaces (Robinson, 2009). Liminal spaces are underused environments in urban space that are more conducive to alternative behaviours. While liminal places offer the advantage of flexibility in activity, such spaces also encourage illegal and dangerous activities (Mason and Korpela, 2009) that unfortunately are linked to youth activity by location (Nolan, 2003). The exclusion of youth activity and the pursuit of liminal spaces for risky activity has become the hallmark of adolescent identity in contemporary society.

Youth transgression of spatial limitations (Janssen, 2009) maintain normalising notions of youth resistance, subversive meanings of place, and the ongoing reconstruction of space (Robinson, 2000). Such transgression, however, may have less to do with adolescents than the limited design intent of the place. Architects, landscape architects, urban planners, and designers continue to believe that the places they design promote ‘good’ social encounters (Dobbins, 2009). However, adolescent activity is often unaccounted for in the design process, making their specific type of behaviour adverse to urban design. The physical environment, as Gibson (1979) argues, affords experience (see also Clark and Uzzell, 2002), but how and for whom remains a strong point of contention for designers that seek to create more sustainable urban environments for everyone (Turner, 2002), including youth (Woolley et al., 1999; Collins and Kearns, 2001; Mugan and Erkip, 2009; White, 1993). In sum, adolescents suffer multiple burdens that prevent them from successfully accessing outdoor, urban environments for play. Adolescents have been identified in the literature as being oversimplified as a single

population; their activity, such as skateboarding, is deemed transgressional to social norms; and, consequently, adolescent needs are often intentionally designed-out of cities.

1.2 Regardless, adolescents play in cities

Adolescent skateboarders are often forced to seek out more liminal and risky environments in which to play. Karen Franck has determined the concept of appropriating space for spontaneous social practice as “loose space.” She writes, “People create loose space through their own actions. With their bodies they lay claim to public spaces, pursuing activities of their choice, activities not intended in the design or program of these spaces” (Franck and Stevens, 2007, p.35). Space is “appropriated” when someone claims a right to the city as a space of social encounter and interacts with the urban environment in a moment of spontaneous practice (Franck and Stevens, 2007). An adolescent, who appropriates a space to play, produces a setting that reveals a level of environmental justice previously inaccessible. Through the creation of such settings for play, the city becomes a playground (Flusty, 2000, p.154), rife with opportunities (for good or bad), and as will be discussed, for “playing-in-the-world.”

Researchers studying young people have found that they produce space by creating settings that meet their interests. De Visscher and Bouverne-De Bie’s (2008) study stated, “children tend to accept most boundaries imposed upon them and to elaborate strategies to maximise their social and cultural opportunities within these boundaries, rather than consent to them” (p.612). This finding is remarkably on target with the familiar concepts of youth resistance—resisting containerisation and maximising opportunities in the available, physical environment. Fredericksen (2002) found that skaters, for example, “creatively use the environment around them” because they have so few spaces to skate (p.46). Teens interact with urban space to extract opportunities that are responsive to their particular needs instead of the intended design. Skateboarders use props, like makeshift benches, and will occasionally manipulate the design of urban places by waxing edges, installing steel edges, or building their own concrete ramps. As Borden (2001) describes, physical features and the built environment in the city transform human experience in relation to the skateboard. Adolescent skateboarders, accordingly, may evidence ways of improving environmental justice through their use and manipulation of the physical environment.

1.3 And, such play has benefits

While the literature clearly creates a platform where adolescents have the capacity to appropriate settings that support their desired activity, few studies (Kraftl and Adey, 2008; Janssen, 2009; Thomas, 2005) have focused on how these settings, in turn, may have positive or negative implications for youth behaviour. The neighbourhood effects of urban areas and suburbs on the physical activity of youth have become an important point of discussion regarding childhood obesity (Aarts et al., 2009; Binns et al., 2009; Cradock et al., 2009; Dunton et al., 2009). Interestingly, nearly all of the discussions regarding youth and physical activity in the urban environment focus on programmed space. This makes sense given that child play places are the historic site of programmed places meeting the child’s desire to play and the parent’s desire to contain. Meeting the mental health needs of youth has become a subject of a more recent trend of scientific discourse and this concern has led to a call for more therapeutic places of retreat for youth

(Shirtcliff, 2010). Even advocacy for alternative sports, such as skateboarding, has entered into the equation to solve youth problems through the production of skate parks (Bradley, 2010). Adolescent “participation in sports, activity, with an increase in activity as youth age, including skating, shows positive implications in youth development” (Dodge and Lambert, 2009). Studying youth behaviour in skate parks, Bradley (2010) identified some of the prosocial gains and positive implications from unstructured activity:

- 1 focus and concentration,
- 2 developing competencies,
- 3 exploring, achieving, expressing identity,
- 4 setting goals and striving to achieve them, and
- 5 social interaction, acceptance and support by others (p.293).

Unfortunately, the scope of Bradley’s identification of benefits of activities like skating is limited to skate parks which operate as programmed spaces and only support youth able to access skate parks. This limitation in current research is largely due to the difficulty of studying adolescent unstructured activity in nonprogrammed environments because adolescents are aware that ‘cities aren’t for teens’ and in order to play, they have to move along or find liminal places to play.

1.4 Significance

The study supporting this paper broadens the literature on the unstructured activity of adolescents beyond insights gained from programmed settings created for youth or specific groups of youth. The study examines unstructured, nonprogrammed urban space and its success or failure to act as a setting that supports prosocial behaviour in adolescents. Ultimately, the goal is to determine whether examination of nonprogrammed urban space holds a broader impact for urban design as well as policy implications for environmental justice and sustainability.

2 Environmental justice by sk8ting in the city

The purpose of this study is to identify the relationship between the affordances of urban, public open spaces in New Orleans and adolescents (‘youth,’ ages 12–19) play behaviour to support prosocial outcomes. Skateboarding is a type of play that involves some risk and some reward, so a prosocial outcome (no individual harm and observable peer support) is captured as a combination of the two. Affordances are the means by which physical, built, and social environment becomes a setting to support play. Since affordances vary across settings, a comparison of multiple observations of youth ($n = 283$) playing in 17 different sites across New Orleans was conducted to inquire into the specific affordances of settings that best explain prosocial outcomes. Unsupervised adolescent behaviour in unstructured environments is notoriously difficult to observe without intrusion, and the presence of an observer can fundamentally change the nature of adolescent behaviour, especially risky or prosocial behaviour. The researcher used a novel means of data collection using unobtrusive observation and YouTube videos for

each of the 17 sites to overcome this limitation (see Shirtcliff, 2015). YouTube videos are publicly accessible documents that provide a tremendous amount of content on settings and behaviour. The play of adolescent skateboarders is a type of performance behaviour that requires long periods of practice to successfully land a manoeuvre. Frequently, the trick is documented by a peer and, when successful or disastrously unsuccessful, the result is posted online. This common element reduced researcher intrusion and observer bias, because the video is part of the performance. Given the inherent complexity of studying naturalistic settings and the need to examine multiple observations of behaviour across multiple sites to achieve external validity, the study required multilevel modelling for statistical analysis. Analyses test whether adolescent behaviour was significantly interrelated with settings and whether adolescents' capacity for prosocial outcomes was best observed within settings with greater levels of appropriation.

3 Research method

3.1 *The methodology of 'playing-in-place'*

Architecture, landscape architecture, urban design, anthropology, psychology, and environmental psychology are a few amongst the many disciplines currently studying the relationship of local environments on healthy human behaviours. For the present study, the notion that settings affect observable behaviour is drawn from researchers in anthropology and phenomenology—the study of the life-world of the individual. Miles Richardson provides a very useful framework for understanding the manner in which variation in individual experience can be similar, outside of cultural background, directly in relation to urban space. This method is important because adolescents have been identified as not belonging to a cultural group but have been shown to behave similarly in urban space. Richardson used comparative analysis to explore how individuals act in separate environments—a market and a plaza (Richardson, 1982). He supported his methodological framework by the phenomenological notion of “being-in-the-world” as opposed to simply ‘being-there’ (p.421). Settings determine the similarity of social interactions. Skateboarders, for example, exercise a creative interpretation of urban environments that is highly in-place (Fredericksen, 2002). The criteria of being-in-place is important to maintain when suggesting that settings account for benefits. The means by which the individual is able to move from being-there and being-in-the-world is through engagement in a setting. Richardson identifies three analytical steps aiding in the transition from being-there to being-in-the-world:

- 1 the preliminary definition supplied by the material culture of a setting;
- 2 the interaction occurring within that setting; and
- 3 the image emerging out of the interaction and completing the definition by restating that situation's sense of place (Richardson, 1982, 423).

Every individual, Richardson suggests, employs these three analytical steps when moving from being-there to being-in-the-world.

How can we use the framework that Richardson proposed to examine settings in New Orleans? Consider how the introduction of teenagers with alternative interpretations of urban space can change a setting. A gathering of teens in New Orleans' City Park, for

example, transforms the pastoral Classical Peristyle and Gazebo into an active setting of physical, creative, and social engagement by youth (Figure 1). The peristyle preliminarily defines a setting of cultural decadence through social performance. The cultural creation of a space intended for weddings, jazz concerts, or peace and quiet is negated by the clamour of skateboards on pavement, rails, and steps. The acoustical cacophony of sound reverberates off the roof above. The transformation of the site is facilitated by the addition of props and skateboards. The teens are clearly performing. A failed flip trick and a body falling on the stage have a different acoustical value than a smoothly executed manoeuvre. The image emerging out of the setting is their own creation and completes their own definition of the space. The teens have successfully manipulated the setting to make the transition to being-in-the-world. Richardson notes that “Out of that response meaning arises, and that meaning is objectified upon the setting so that the setting becomes a full statement, a read text, and therefore the material image of the situation” (p.434). ‘Meaning,’ for Richardson, is the interdependent social response to a situation that creates or completes a setting.

Figure 1 Youth shown skateboarding in the Peristyle at City Park (see online version for colours)



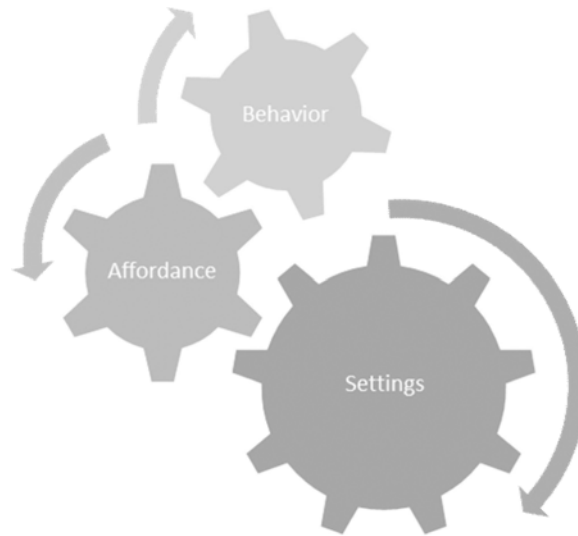
Note: For future reference, the use of the box-bench is an example of temporary appropriation

Source: Image capture from (t382, June 26, 2011)

Accordingly, the physical world, following Richardson’s model, is the “creation of a setting that impinges directly upon the social responses to that setting” (p.434), i.e., behaviour influences settings which influence behaviour. Richardson’s comparative model identifies an important means to measure how this happens: interdependence. Interdependence is the mutual dependence between the environment and the individual to afford activity (Figure 2). If settings matter, and adolescents actually do have the capacity

for prosocial gains from the affordances of settings to support play, then the study must show that skateboarding adolescents behave interdependently.

Figure 2 Conceptual model of interdependence



3.2 *Data collection*

Data were collected for analysing behaviour and affordances using unobtrusive observational research and archiving and coding of YouTube videos. Unobtrusive observation was used based on similar studies of behaviour where participation or interviews would interrupt the activity under observation (Lee, 2000) or where access to the setting of the activity would otherwise remain inaccessible to the researcher (Linkletter, Gordon and Dooley, 2010). Data were collected from in-field observations and documentation of urban environments using procedures identified by Shirtcliff (2015). The study proposed 150 and completed 173 observation time points. At no point during the study was the researcher confronted by youth. In the field, I maintained sufficient distance to minimise interactions as I conducted observations hand drawing in notebooks. At the end of data collection, I estimated about 400 independent observations of youth playing in different urban locations would successfully be coded for quantitative analysis. However, very few were completed because adolescents frequently modified their behaviour with the presence of an unknown adult.

Anonymously posted online videos of youth playing in 17 public open spaces were collected during the course of the study. The study collected 104 unique videos from online video search engines such as YouTube and Vimeo using keywords “Skate, skate*, Sk8, and Skateboard” in combination with “NOLA and New Orleans.” During the year of data collection, as the number of videos collected increased, time period of posting, within the past week or month, became a more reliable means of filtering and identifying videos (for further information on the use of YouTube as a research tool for difficult to access populations or environments see Shirtcliff, 2015).

The study also collected information on the affordances of each site through site visits and geographic mapping of the urban context surrounding each site. Physical features were documented, following recommendations by Zeisel (2006) using notes and photographs with specific attention paid to evidence of sites being used for skateboarding, for example: paint on rails left from the bottom of skateboards, waxed edges, steel rails glued to steps, and improvised ramps. Urban context accounted for general area activity for each site reported crimes during the year of the study, and walkability (Table 2).

3.3 Data coding

The study successfully collected and coded 284 separate observations of youth (Table 1) playing in urban settings. In terms of age group ($\mu = 15\text{--}16$), 27 young adolescents (9–12), 105 mid-adolescents (13–15), 98 late adolescents (16–18), and 54 emerging adults (19+) were coded from observations. Since ethnic variations were heavily skewed to two groups ($\mu = .63$), the variable was dichotomised into white (62%, $n = 178$) and mostly African-American (38%, $n = 106$). At the close of data collection, 284 separate observations had been successfully coded for further analysis, placing this study well within boundaries established for sample sizes in precedent studies (Forsyth et al., 2008). Inter-rater reliability was maintained by achieving $\kappa > .75$ (Haidet et al., 2009).

Table 1 Individual characteristics

<i>Relative age</i>	<i>Variable</i>	<i>Frequency</i>	<i>Percent</i>
Young adolescent (9–12)	1	27	9.4
Mid-adolescent (13–15)	2	105	36.5
Late Adolescent (16–18)	3	98	34.0
Emerging adult (19+)	4	54	18.8
Total Mean 2.6; SD .9		284	98.6
Ethnicity			
White/Caucasian	0	178	36.8
non-White	1	106	61.8
Total Mean .37; SD .48		284	98.6
Gender			
Male	0	281	98.9
Female	1	3	1
Total Mean .01; SD .1		284	

3.3.1 Outcome variable

Observed play behaviour was measured through a risk/reward scale (Figure 5). The dependent variable was developed as a factor of two ordinal variables collected during study, prosocial, and risk taking. The prosocial variable ($k = .75$) was defined as an ordinal-level variable with increasing levels of observed behaviour: (0) the default, none, escalated to

- 1 some but barely detectable,
- 2 to detectable but limited to a few observed individuals,
- 3 to more evident more than half of people in setting show support,
- 4 to most evident or the number of individuals showing support greatly outnumber those who do not (Figure 3).

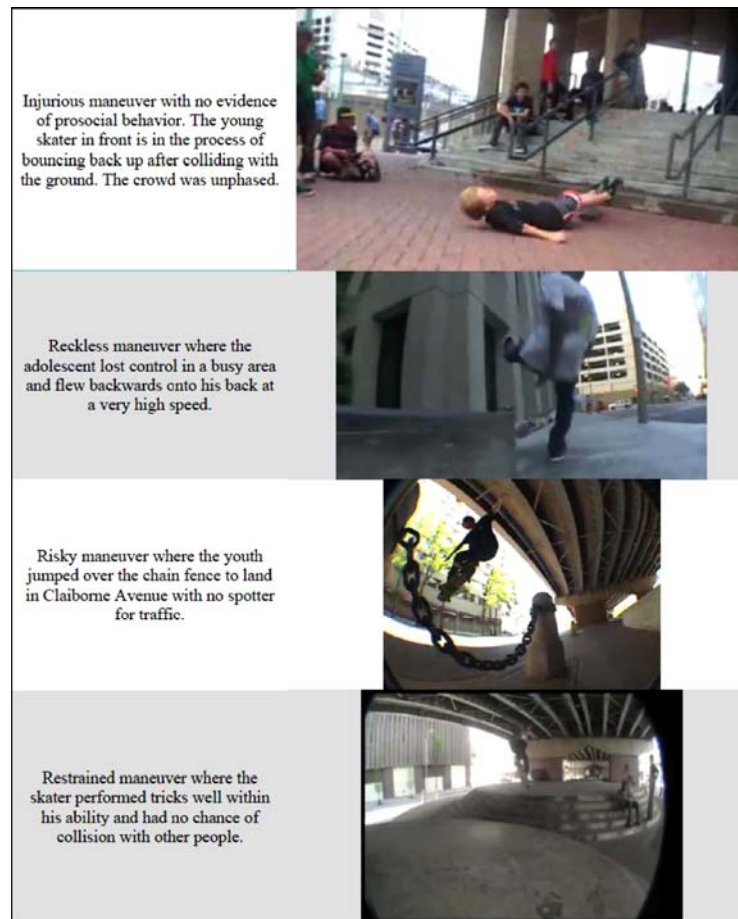
Figure 3 Illustrations of prosocial behaviour (see online version for colours)



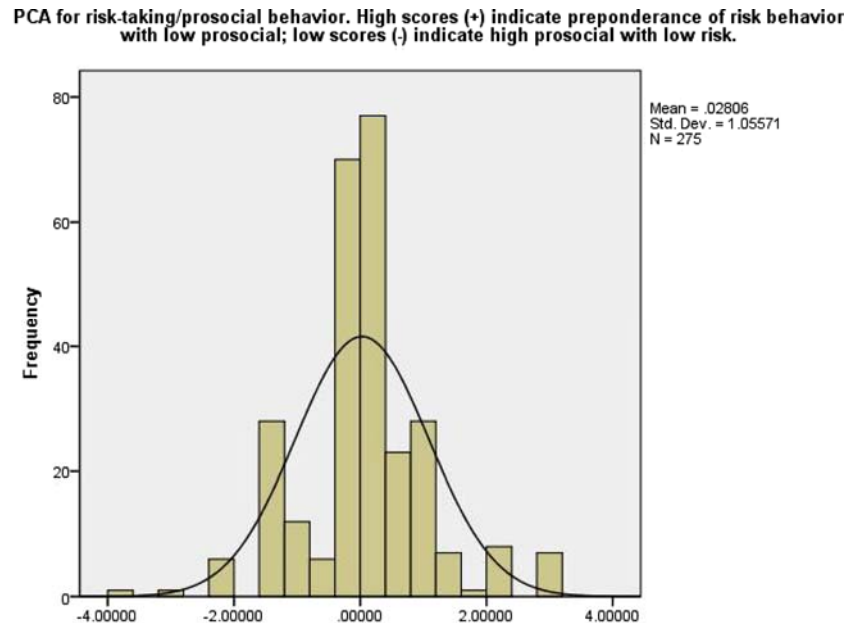
Risk-taking ($k = .88$) was also entered as an ordinal-level variable ranked from no observed behaviour noted, to cautious, to restrained, to risky, to reckless, and finally escalating to destructive/injurious (Figure 4). Third, these opposing behaviours were combined into a single outcome variable of interest, denoted 'play,' which indexed the level of risk-taking and the level of prosocial behaviour in each observation (Figure 5). A principal component analysis (PCA) was utilised to create a factor score that merged both risk-taking behaviour and prosocial behaviour into a single construct. PCA converts potentially correlated variables from observations into linearly uncorrelated values. PCA

is used for exploratory data analysis and for predictive modelling. The PCA revealed a single component with an eigenvalue of 1.11 that explained 55.3% of the total variance in the two variables. The factor loadings indicate that higher scores on the PCA are comprised of greater risk-taking behaviour (loading = .744) and less prosocial behaviour (loading = -.744). This factor structure was anticipated given the negative correlation of risk-taking and prosocial behaviour ($r(273) = -.11, p = .079$). Consistent with other work in which PCAs are computed with two measures of interest (Essex et al., 2003; Shirtcliff and Essex, 2008), the interpretation of such a factor is that higher scores are associated with a preponderance of risk-taking behaviour over prosocial behaviour; conversely, lower scores are associated with a preponderance of prosocial behaviour over risk-taking behaviour. This variable was normally distributed (Figure 5).

Figure 4 Examples illustrating scale of risk-taking behaviour (see online version for colours)



Notes: Figures 3 and 4 illustrate examples of risk-taking and prosocial behaviour. All of the examples from videos of the prosocial category 'more signs of support' involve background noise that are not captured in a still image. For an example of no prosocial behaviour, see the first example in Figure 6.

Figure 5 Distribution of risk/reward scale (see online version for colours)

3.3.2 Criterion variables

Appropriation was indexed according to level of youth manipulation of their environment (Figure 8 and Table 3). Permanent environmental manipulation occurred in 12% of coded observations in obvious ways, such as the installation of steel rails or concrete ramps to perform tricks on. Sometimes (31%) sites were manipulated with temporary modifications, such as the use of street signs to make a temporary ramp out of stairs or waxing curbs. Finally, sites were subtly manipulated 57% of the time by the presence of youth, as expressed by the laying down of backpacks and clustering or ordering of people to create temporary barriers. Given the categorical nature of the criterion variables, appropriation was ‘dummy’ coded into two measures: temporary and permanent (Tabachnick and Fidell, 2007, p.6). When both temporary and permanent appropriation dummy variables are included in statistical models, the reference group becomes ‘presence appropriation.’

Other predictor variables collected during the study focused on the affordances of settings (Table 2). Urban context, social/peer composition, and physical features are categorical variables used to capture available opportunities and limitations of sites to support settings of adolescent play in this study.

Urban context variables included total crime, walkability, neighbourhood type, and neighbourhood activity in a 500 m radius. Urban activity level was entered in as a nominal-level variable describing whether the area was abandoned, busy urban area with lots of traffic, minimally used but not abandoned, moderately busy, a park area, and a residential area. Walk Scores (scale ranges from 0 to 100) were gathered from the publicly accessible online database walkscore.com and entered into a GIS database. Walk scores were mean-centred for analysis in SPSS. Walk scores describe the number

of destinations within a quarter-mile walking distance and represent the pedestrian activity of a given area. Total crime was downloaded from the online government-supported database: <http://www.crimemapping.com/map/la/neworleans>. Crime statistics extended back to January 20, 2011 and an initial 1/2 mile radius used for each site and later reduced to the 500 m radius in a GIS database. Total crime was standardised for analysis in SPSS. Last, each site and its 500 m context was defined by the dominant land use (residential, business, and tourist) in SPSS.

Table 2 Variables coded in study

<i>Variable</i>	<i>Type</i>	<i>Values</i>	<i>Measure</i>
Risk/Prosocial	DV	Prosocial –3.99 to Risk taking 3.025	Continuous
Risk taking	DV(+)	(0) No behaviour; (1) Cautious; (2) Restrained; (3) Risky; (4) Reckless; (5) Destructive/Injurious	Ordinal
Prosocial	DV(–)	(0) None; (1) Some but barely detectable; (2) Detectable but limited to a few individuals; (3) More evident, more than half of the peers show traits; (4) Most evident, the number of individuals showing support greatly outnumber those who don't	Ordinal
Location	CV	Urban Location in New Orleans, Spanish Plaza, Jackson Square, Ferry Terminal, Woldenburg Park, One Shell Square, Hunter's Field, Pancakes, Annunciation Square, Coliseum Square, Clay Square, Laurence Square, The Fly, City Park, Lee Circle, City Hall Plaza, French Market, Washington Square, Peach Orchard	Nominal
Appropriation	CV	(0) Presence; (1) Temporary; (2) Permanent	Ordinal
Individual approximate age	CV	(0) Cannot be determined; (1) Young Adolescent (9–12); (2) Mid-Adolescent (13–15); (3) Late Adolescent (16–18); (4) Emerging Adult (19+)	Ordinal
Individual ethnicity	CV	(0) White; (1) African-American; (2) India; (3) Other	Categorical
Individual gender	CV	(0) Male; (1) Female	Categorical
ID of site feature	CV	Not Specified; Barrier; Driveway; Furniture/Bench; Gap/Pot Hole/Storm Drain; Parking Lot; Railing/Hand Rail; Ramp; Sidewalk; Steps; Street; Wall (+3'); Feature/Fountain/Sculpture; Planter/Seat Wall; Landing/Ledge (–3'); Playground Equipment	Categorical
Total crime	CV	Range (0 to >0) 42–1, 612 Reported Crimes	Continuous
Walkability	CV	Range (0 to 100) 31–100 Recorded Scores	Continuous
Urban context	CV	(1) Residential; (2) Tourist Destination; (3) CBD	Categorical
Location description	CV	Abandoned Urban Location Empty outside of Youth; Busy Urban Area with Traffic; Minimally used but not abandoned urban location; Moderately busy urban location; Park Area	Categorical
Observed play activity	CV	Skateboarding; Rough-housing; parkour; hanging-out; graffiti; manipulating urban space	Categorical

Table 2 Variables coded in study (continued)

<i>Variable</i>	<i>Type</i>	<i>Values</i>	<i>Measure</i>
Trick type	CV	Flip Trick (Ollie); Aerial; Slide or Grind	Categorical
Trick completion	CV	Yes/No	Categorical
Group size	CV	Small (1–5); Moderate (6–10); Large (10–19); Very Large (20+)	Ordinal
Group gender	CV	(0) All Male; (1) Mostly Male; (2) Mostly Females; (3) All Females@@@	Ordinal
Group ethnicity	CV	(0) All White; (1) Mostly White; (2) Even Distribution; (3) Mostly non-White; (4) non-White	Ordinal
Non-youth users	CV	None (100% Youth); Few (1–10); Some (11–20); Many (21–30); Busy (31+)	Ordinal
Police activity	CV	(0) None; (1) Walk through Site; (2) Interacted with Youth; (3) Confronted youth	Ordinal
Confrontations	CV	Yes/No	Categorical

Table 3 Observed appropriation across sites

<i>Site name</i>	<i>Level of appropriation n (%)</i>			<i>Total coded (DV)</i>
	<i>Presence</i>	<i>Temporary</i>	<i>Permanent</i>	
Spanish plaza	4 (2.4%)	0 (0%)	0 (0%)	4
Jackson square	4 (2.4%)	0 (0%)	0 (0%)	4
Ferry terminal	14 (8.2%)	4 (4.9%)	0 (0%)	18
Woldenburg park	19 (11.2%)	1 (1.2%)	0 (0%)	20
One shell square	32 (18.8%)	0 (0%)	0 (0%)	32
Hunter's field	6 (3.5%)	41 (50.6%)	15 (46.9%)	62
Pancakes	33 (19.4%)	21 (25.9%)	0 (0%)	54
Clay square	1 (.6%)	0 (0%)	2 (6.3%)	3
City park	22 (12.9%)	13 (16%)	0 (0%)	35
Lee circle	6 (3.5%)	0 (0%)	0 (0%)	6
City hall plaza	1 (.4%)	0 (0%)	0 (0%)	1
French market	2 (1.2%)	0 (0%)	0 (0%)	2
Washington square	1 (.4%)	0 (0%)	0 (0%)	1
Peach Orchard	0 (0%)	0 (0%)	14 (43.8%)	14
Total (% of Total)	145 (57%)	80 (31%)	31 (12%)	258

Social/peer composition was defined as group size, group gender, non-youth users, presence of police, and confrontations. Group size was an ordinal-level variable describing the size of the group present from small (1–5), moderate (6–10), large (10–19), and very large (20+). Group gender accounted for the variation of sex amongst

the peers from all male, presence of one or more females, to all female. Group ethnicity was used to account for variability in terms of divergence of ethnicity from the default, white, to mostly white, to relatively even distribution, to mostly non-white, and finally non-white. Observed police activity was entered in as a measure, and observed confrontations with police or authority figure was entered in as well.

Physical feature variables were continuously updated over the course of the study as new observations made way to new features used by youth. Physical features were entered in as rail or barriers, driveway or sidewalk or street, street furniture, gaps, ramps, steps, walls, grass, feature or planter or fountain, landing, and other, such as playground equipment. Last, trickability was coded as the observed play activity, trick type, and trick completion (Woolley and Johns, 2001). The three categories of tricks are ollie, aerial, and board slides or grinds. Tricks were also classified by whether or not they were landed successfully. Trickability accounts for the use of physical features to support the activity.

4 Analysis

Models were run using SPSS vs. 19.0 Linear Mixed Models software. Multilevel modelling (MLM) was used to examine play behaviour across urban sites. I selected this strategy when designing the study because MLM permits site affordances to be nested within sites and observations can then be used to identify if there are any similarities in terms of play behaviour. This is important for urban space because it demonstrates how the behaviours observed at each site are similar to each other, linking play to settings through the affordances of place. Foremost, MLM does not violate the assumption of independent observations when modelling nested data, thereby permitting a more accurate real-world assessment since adolescent behaviour within a site is likely to be similar when that site is observed again later. This strategy permits a more reliable means of calculating the similarities of differences (i.e., residuals) within sites as variance in behaviour is statistically contrasted against other behaviours observed within that site rather than other behaviours observed at any point in the study.

The MLM strategy employed the build-up method as suggested by Hoffman (2007). Following Hoffman (2007), restricted maximum likelihood (REML) was used to make estimates and inferences about covariance parameters as it is the best method available to measure residual variance. First, an initial unconditional model free of any predictors was used to measure the amount of variation in behaviour, differentiating between-site variance from within-site variance. This model is used to determine the best variance structure for further analyses, a set point for -2 most likelihood deviance scores, and a base descriptive intraclass correlation coefficient (ICC).

The ICC is a key statistic that is commonly used to evaluate similarities for several 'classes' in a school, or, in this case, urban sites in New Orleans. The ICC measures how well residuals are correlated and can be used to indicate the degree to which observations taken at different locations are stable within each site. The ICC is calculated as the relative proportion of within versus between site variance. If the ICC is low or nonsignificant, then within-site specificity is minimal, and variation can be reasonably modelled as fixed effects across all locations (i.e., there is minimal dependence of observation on the site). If the ICC is high or significant, then there is a within-site correlation that would remain unaccounted for by an aggregated means model. Statistically, a significant ICC indicates that traditional regressions would be

inappropriate as the assumption of independence was violated by collecting multiple observations within each site. Of primary conceptual interest, a high ICC indicates that observations within a site are similar to other observations within that site and observations within each site are dependent on one another by virtue of their setting.

5 Results

In an empty mixed model that predicted the outcome play behaviour, the ICC was .23 ($p = .019$). This indicated that 23% of the total variance in play behaviour was due to similar behaviour observed within sites and 77% of variation is due to variation in play behaviour within each site from one observation to another.

So, what does this mean? The ICC indicates that behaviours are similar to one another if observed within the same site, indicating that setting influences behaviour. Conceptually, this is suggestive of interdependence: the ICC was sufficient to support the notion that adolescents need to be shown as ‘playing-in-the-world.’

Going beyond the ICC, which indicated the impact of settings, what is it about a site that consistently supports its use as a setting affording prosocial behaviour? The use of MLM permits the analysis to go further into the characteristics of the behaviour and site to elucidate why settings mattered. The study found that several of the observed affordances systematically influenced play behaviour. Of primary interest, I examined the extent to which adolescents were able to appropriate a location within each observation and across all 17 sites. Figure 6 shows the estimated slopes for temporary appropriation and permanent appropriation. The Y-axis indicates the Empirical Bayes estimate which captures the predicted play behaviour score ‘shrunk’ or corrected for site-to-site variance. The initial parameter discloses the effect of presence on play, indicating that risky play behaviour is highest at sites where presence alone is permitted ($\beta = .42$ (.12), $p < .05$). The parameter estimates of temporary and permanent indicate the slope (β) of the effect of increasing levels of appropriation on play. The negative slope for temporary presence ($\beta = -.69$ (.17), $p < .001$) shows an increase in the preponderance of prosocial behaviour relative to risk-taking behaviour when temporary appropriation is observed as opposed to presence alone. This heightened prosocial play behaviour is expressed even further in locations where permanent appropriation has been achieved ($\beta = -.92$ (.24), $p < .001$). As I will discuss further, the extent to which sites are appropriated by youth predisposes them to more, not less, prosocial behaviour suggesting that adolescents have the capacity to create prosocial settings.

Next, I examined whether adolescent play behaviour was impacted by features of the setting. Table 4 indicates that the study found meaningful results from urban context, social context, and physical features and trickability. Urban context variables (‘+’ betas = increase in risk; ‘-’ betas = increase in prosocial) of total crime (.001), walk score (.015), tourist neighbourhood (.811), and central business district (CBD) (.077) suggests that adolescents show a proclivity toward increases in risk-taking behaviour in settings with characteristics of tourist neighbourhoods; however, the effect of urban context variables is minimised when controlling for appropriation (Figure 7), suggesting that the extent to which adolescents are able to play-in-the-world is more meaningful. Only residential (-.544) showed an increase in prosocial behaviour. Social context variables support prosocial behaviours regarding group size (-.253), presence of females (-.535), and diversity of peers (-.167); however, again, this preponderance is lost when

controlling for appropriation (Figure 8). Only homogenous peer groups (.372) predicted an increase in risk-taking behaviour. Physical features affording tricks also influenced observed play behaviour, with furniture (−.655), landings (−.469), and gaps (−.439) supporting prosocial behaviours, and the use of walls (.68), features (.67), and steps (.62) reflecting increases in risk-taking behaviours; however, these characteristics too were also found to be better accounted for with the level of observed appropriation (Figure 9). Confrontations (3.049) were a large predictor of risk-taking behaviour across sites.

Figure 6 Appropriation predicts shift from risk-taking (+) to preponderance of prosocial behaviour (−) (see online version for colours)

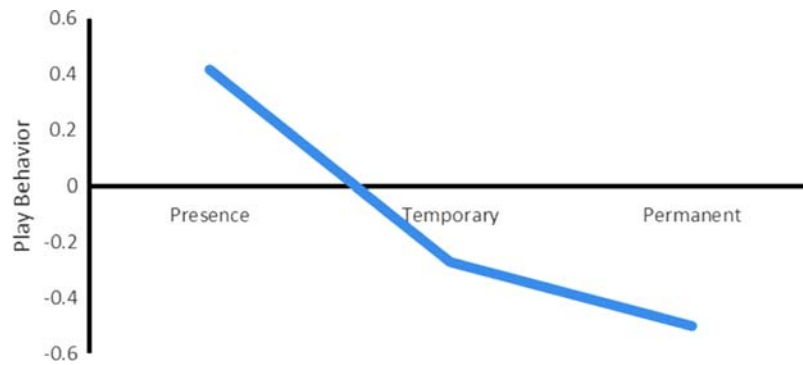


Table 4 Table of regressions for significant effects on the DV: risk/reward observations. This table does not distinguish between sites

Parameter	Regression table: DV prosocial(−) to risk-taking(+) scale factor*	
	Beta**	Sig
Urban sites		
Data location	−.057	$p < .001$
Urban context		
Total crime	.001	$p < .001$
Walk score	.015	$p < .001$
Residential	−.544	$p < .001$
Tourist	.811	$p < .001$
CBD	.077	–
Intensity of appropriation		
Appropriation (all)	−.41	$p < .001$
Appropriation : Presence (APPR1)	.938	$p < .001$
Appropriation : Temporary (APPR2)	−.747	$p < .001$
Appropriation : Permanent (APPR3)	−.728	$p < .001$

Table 4 Table of regressions for significant effects on the DV: risk/reward observations. This table does not distinguish between sites (continued)

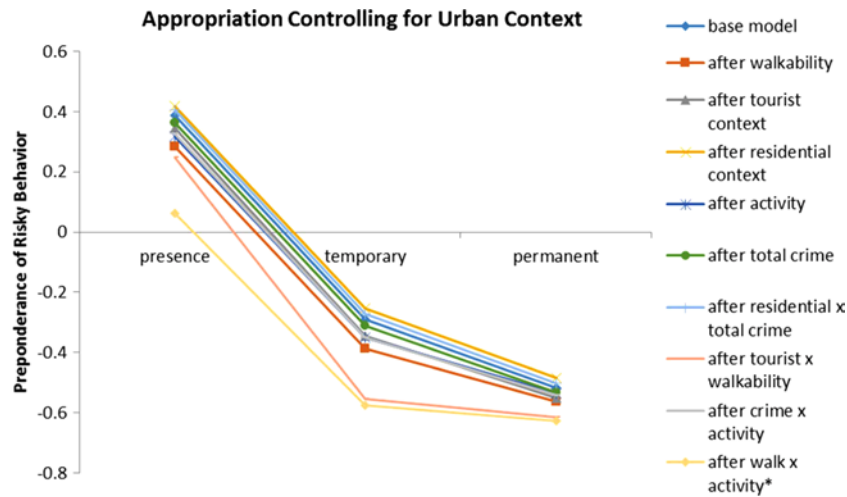
<i>Parameter</i>	<i>Regression table: DV prosocial(–) to risk-taking(+) scale factor*</i>	
	<i>Beta**</i>	<i>Sig</i>
Type of activity		
Play type	.867	<i>p</i> = .022
Slide/Grinds	–.296	<i>p</i> = .046
Ollies	.296	<i>p</i> = .042
Completed	–.514	<i>p</i> < .001
Social context		
Peer group size	–.253	<i>p</i> < .001
Peer group gender	–.535	<i>p</i> < .001
Peer group ethnic composition	–.167	<i>p</i> = .005
Peer group ethnic homogeneity	.372	<i>p</i> = .018
Physical features		
Feature ID (all)	.04	<i>p</i> = .01
ID furniture	–.655	<i>p</i> = .002
ID gap	–.439	<i>p</i> = .013
ID steps	.623	<i>p</i> < .001
ID wall	.681	<i>p</i> = .015
ID feature	.67	<i>p</i> = .009
ID landing	–.469	<i>p</i> = .031
Confrontation		
Confrontation	3.049	<i>p</i> < .001

*Regression table identifies those variables that successfully loaded onto the DV. Positive betas indicate an increase in risk-taking behaviours. Negative betas indicate an increase in prosocial behaviour. The larger the beta, the more severe the slope from the intercept.

**Betas are reported unstandardised coefficients.

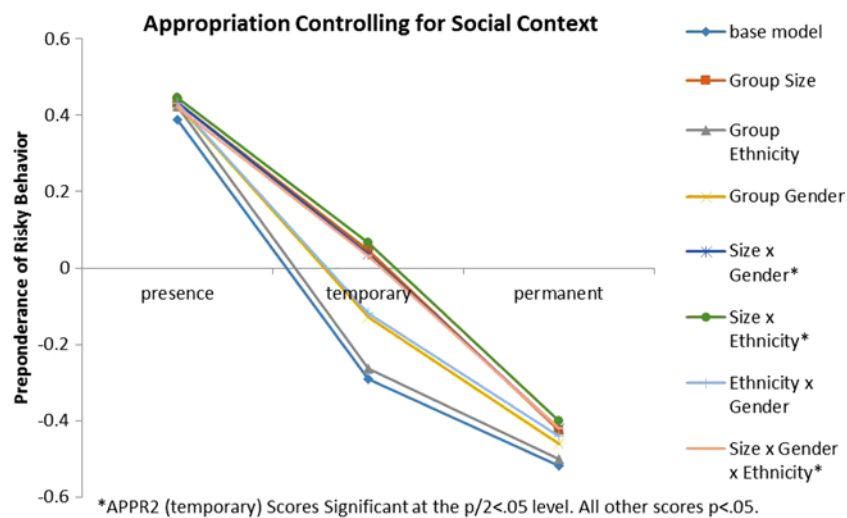
Given the emphasis on appropriation, I then examined whether the effect of appropriation on adolescent play behaviour persisted even after accounting for the effects of urban context, social context, physical features, and trickability. Several iterations of multi-level models looked at the effects of urban context, social/peer context, site features, and trickability on play behaviour within sites. Multiple variables from urban context, peers, and physical features/trickability produced significant associations with prosocial or risk-taking outcomes (Table 5). However, risk-taking behaviours were more likely to occur in settings where presence alone was permitted and prosocial behaviours more likely as youth were more able to appropriate the site as a setting for play even after statistically accounting for these other elements of the context and physical features of the site. The finding suggests that adolescents create prosocial settings through interdependence and do so best when allowed to appropriate a site.

Figure 7 Graph of appropriation levels when controlling for urban context (see online version for colours)



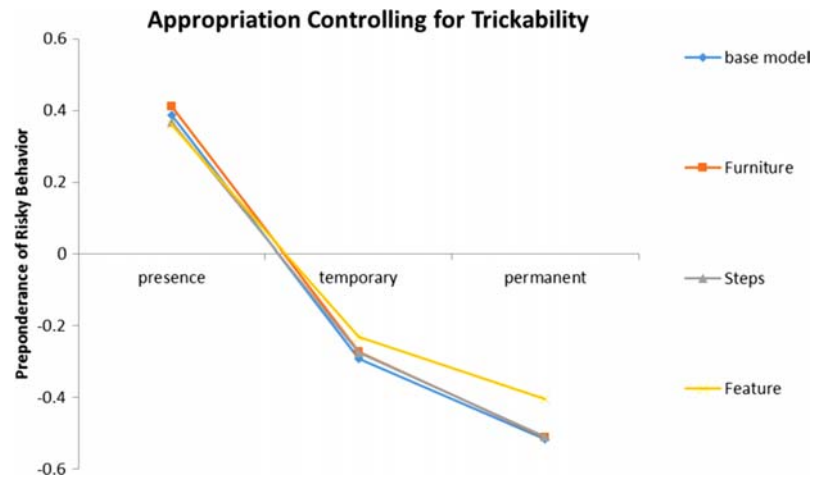
Notes: Figure 7 illustrates the average effect each urban context variable has on the DV when no modifications are present, then when temporary modifications are recorded, and finally when permanent modifications are recorded

Figure 8 Graph of appropriation levels when controlling for social context (see online version for colours)



Notes: Figure 8 illustrates the average effect each peer context variable has on the DV when no modifications are present, then when temporary modifications are recorded, and finally when permanent modifications are recorded

Figure 9 Graph of appropriation levels when controlling for trickability of site features. (see online version for colours)



6 Discussion: settings for playing-in-the-world

The examination of data collected on adolescent play behaviour from YouTube videos successfully identified that young skaters in New Orleans exhibit an increase in prosocial play behaviours in more appropriated settings. As suggested by the gear model (Figure 2), settings, behaviour, and affordances were shown working interdependently across multiple sites where youth were found playing in New Orleans. The initial finding permits a closer examination of the affordances in settings that best predict prosocial behavioural outcomes. While the study found that the physical features of the built environment clearly matter—supporting previous research on adolescents as well as current urban design efforts directed to improved cities for adolescents—site features alone are insufficient to create a setting that elicits a prosocial response. Rather, as this study indicates, settings that also support increasing levels of appropriation by adolescents would promote prosocial benefits of play in urban environments.

The Peach Orchard, for example, was a Do It Yourself (DIY) skate park built in New Orleans in 2010 and demolished in 2012. During its brief existence, the Peach became a destination for local youth to skate, have fun, and spend time amongst people their age or older who shared a common interest. The motto of the Peach was: 'It's cool not to skate.' The maintenance, design, and building of the only skate facility in the city was entirely up to the young skaters who frequented the spot. Adolescents would work with older skaters to improve their technique, build new ramps, and encourage each other to try again. The vibe was always positive and contrasted with its location—a sliver of vacant land between a railroad and a raised interstate in a heavily blighted part of New Orleans (Figure 10). Places like this exist in every metropolitan area in the USA. Such sites are off the grid locations that embody a lot of what it means to be an adolescent. Removed from daily life and supervision, there is a sense of freedom in the place that makes it distinct from the *a priori* codes of home or school. Over time, young people witness the setting change because of their efforts, giving them a sense of ownership. As participants of a larger community of likeminded individuals, they have a voice and exercise control,

giving them a sense of empowerment, and helping develop a sense of identity. After its demolition, a new DIY park was reincarnated by the same group directly under the adjacent expressway, over the concrete surfaces of long-forgotten tennis courts. As of February 28, 2015, this new park, 'Parisite,' was officially christened by Mayor Mitch Landrieu as New Orleans first, official, public skate park. The new park reinforces the value of appropriation and is an important precedent for urban designers and policymakers to reevaluate the value of liminal environments to cities.

Table 5 MLM models of significant main effects and effect on outcomes when controlling for appropriation (see online version for colours)

Criterion	Urban context															
	Main effect				Presence				Temporary				Permanent			
	r ²	β	SD	P	β	SD	P	β	SD	P	β	SD	P			
Walkability	0.094	0.02	(0.01)	*	0.09	(0.12)		-0.66	(0.16)	*	-0.78	(0.25)	*			
Residential	0.067	-0.82	(0.17)	*	0.42	(0.14)	*	-0.67	(0.16)	*	-0.78	(0.25)	*			
CBD	0.001	0.18	(0.39)		0.39	(0.13)	*	-0.68	(0.16)	*	-0.92	(0.24)	*			
Tourist	0.087	0.7	(0.30)	*	0.34	(0.13)	*	-0.68	(0.16)	*	-0.89	(0.24)	*			
Urban activity level	0.003	0.15	(0.09)		0.32	(0.13)	*	-0.66	(0.16)	*	-0.85	(0.22)	*			
Total crime (500m)	0.141	0.39	(0.12)	*	0.36	(0.14)	*	-0.67	(0.16)	*	-0.9	(0.25)	*			
Residential with crime	0.145	1.06	(0.40)	*	0.41	(0.14)	**	-0.68	(0.16)	*	-0.91	(0.26)	*			
Tourist with walkability	0.133	0.03	(0.01)	**	0.25	(0.09)	*	-0.8	(0.14)	*	-0.86	(0.19)	*			
Urban activity with crime	0.149	0.07	(0.02)	*	0.33	(0.13)	*	-0.68	(0.16)	*	-0.87	(0.22)	*			
Urban activity with walkability	0.136	0.01	(0.00)	*	0.06	(0.12)		-0.64	(0.16)	*	-0.69	(0.21)	*			
Criterion	Social/Peer context															
	Main effect				Presence				Temporary				Permanent			
	r ²	β	SD	P	β	SD	P	β	SD	P	β	SD	P			
Group size	0.099	-0.17	(0.05)	*	0.43	(0.11)	*	-0.39	(0.19)	*	-0.86	(0.22)	*			
Group gender	0.061	-0.31	(0.12)	*	0.43	(0.11)	*	-0.56	(0.17)	*	-0.89	(0.22)	*			
Group ethnicity	0.029	-0.13	(0.80)	**	0.42	(0.12)	*	-0.69	(0.17)	*	-0.92	(0.24)	*			
Size with gender	0.1	0.27	(0.09)	*	0.42	(0.09)	*	-0.38	(0.19)	**	-0.88	(0.20)	*			
Size with ethnicity	0.102	0.31	(0.11)	*	0.44	(0.10)	*	-0.43	(0.22)	**	-0.84	(0.23)	*			
Ethnicity with gender	0.077	-0.14	(0.04)	*	0.43	(0.11)	*	-0.6	(0.19)	*	-0.86	(0.23)	*			
Ethnicity with gender with size	0.103	-0.03	(0.01)	*	0.42	(0.09)	*	-0.39	(0.23)	**	-0.84	(0.20)	*			

Figure 10 The peach orchard. A DIY skate park on a forgotten strip of concrete between i-610 and the southern Pacific railroad (see online version for colours)



Liminal places and skate parks on the ‘edge’ of urban centrality simultaneously marginalise adolescent activity and provide them with access to free space that helps them to build local knowledge. Such places continue to reflect the transgressive behaviour of youth, perpetuating the culture of mistrust, and encourage prosocial behaviours and promote individual development. The Peach Orchard reflected both transgressive behaviour (trespassing and vandalising public property) and peer support (the concrete ramps represent group effort). Amid these contradictions, the explanation of youth preferences for liminal spaces, for prosocial or transgressive behaviour, is insufficient. Rather, these places are simply more likely to afford opportunities to intensify appropriation and avoid confrontations. This finding suggests that researchers should stop reducing such behaviour to being merely insurgent, transgressive, or resistant. Instead, increased appropriation of sites is a concrete example of how adolescents and others build, literally, interdependence with settings.

As researchers focus on how to encourage an increasingly obese population to live actively and develop into competent citizens, adolescent skateboarders are already engaging in an active lifestyle and developing competencies, improving self-esteem, and engaging in citizen-minded behaviours. In the New Orleans study, the applicant used YouTube videos and site surveys to identify 17 similar sites across the city. The analysis of videos and sites revealed significant similarities in behaviour as reciprocal with the physical features and urban context of each setting. Future research needs to be conducted across multiple cities to improve generalisability of the value of appropriation and use of YouTube as a research tool. The findings have potential implications for policy and urban design practices that make room for adolescents in cities to create, play, and develop competencies as future citizens.

7 Conclusion

Should sites like the Peach be sustained or demolished? Typically, as appropriated locations become hubs for youth activity, cities come under pressure to either bar access or eradicate the changes. The common reasons for depriving youth of such resources is due to changes in land value (Howell, 2005) or perceived increase in criminal activity (Robinson, 2005)—two factors needing further study as they relate youth activity. The outcome of current urban strategies encourages youth to seek more extreme measures to:

- 1 find sites in locations further from home;
- 2 accept higher levels of risk associated with more confrontational settings, such as busy public areas; or,
- 3 discourages them from activity, supporting sedentary activity and the national tendency towards obesity (Dunton et al., 2009; Potestio et al., 2009).

A change in policy based on similar research would show that regardless of land vacancy or criminal activity cities can support youth through urban design interventions that sustain appropriated sites as settings for youth.

The current study has shown that adolescents possess the capacity to appropriate settings that create prosocial outcomes. Their physical efforts to enhance play create previously inaccessible benefits. The finding challenges notions of design intent in urban design practices by suggesting that the appropriation and adaptation of sites to promote settings is fundamental to creating sustainable cities. This finding has implications for urban planners and designers, youth advocates, and cities struggling to improve the urban conditions affecting marginalised populations in the USA. When we restrict the places youth identify with—the places that support their social relations as rendered visible through the intensity of appropriation—we risk limiting the identity of the place to the extremeness of the behaviour and the behaviour to the extreme limits of urban space. We create settings that inadvertently encourage risk-taking behaviours. Allowing adolescents to appropriate settings to support play would have prosocial benefits as long as it is setting that they create. Such *playing-in-the-world* creates new benefits and promotes environmental justice by diminishing cumulative risk.

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