Master Thesis

The effects of lighting and disorder on the perception of social safety of waiting passengers at a railway station platform.

Laura Vos

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EXAMINATION COMMITTEE

Dr. ir. P.W. de Vries
Dr. M. Galetzka

UNIVERSITY OF TWENTE.

Contents

I   Summary

The importance of feelings of social safety in public transportation is studied frequently (e.g. Van Hagen, 2011; Van 't Hof, 2008). Factors in the environment are found to influence the perception of social safety (Johansson, Rósen & Küller, 2011; Van 't Hof, 2008). Johansson, Rósen & Küller (2011) showed that lighting in an environment can enhance feelings of social safety. Disorder in the environment on the other hand, is found to have a negative influence on feelings of social safety (Duineveld, 2010). In addition, disorder in an environment attracts more disorder and petty criminal behavior (Keizer, Lindenberg & Steg, 2008). This in turn again negatively influences the feelings of social safety in the environment. Research from Molenaar (2010) however, showed that enhancing the visibility of disorder by lighting diminishes the perception of disorder. This indicates a complex interaction between lighting, disorder, and feelings of social safety. In this study this relationship is researched. The variables 'type of passenger', 'perceived control', 'overview', and 'perceived crowding' are taken into account in this study, because findings in the literature suggest that these variables can influence feelings of social safety.

In this study 150 participants watched a slideshow of a railway station platform where the factors lighting, disorder and type of passenger were varied. Next, the variables social safety, overview, control, and perceived crowding were measured. A 2 (lighting condition: dark platform versus light platform) x2 (type of passenger: must passenger versus lust passenger) x2 (type of disorder: order versus disorder) between subjects MANOVA was performed.

The results of the multivariate analysis of variance were not significant. The results of the univariate analyses of variance indicated a positive relation between perceived lighting and feelings of social safety which is mediated by overview. Participants in the light condition felt more safe in the disorder condition than in the order condition. Must passengers in the combined dark and disorder condition reported lower feelings of social safety than other passengers. Social safety and overview were found to positively influence approach behaviour. Perceived control and the perception of disorder were found to positively influence the evaluation of the platform. However, because of the lack of significant findings in the multivariate analysis of variance, there is a possibility that the findings of the univariate analyses of variance are the result of chance.

II Samenvatting

Naar het belang van gevoelens van sociale veiligheid is regelmatig wetenschappelijk onderzoek gedaan (o.a. Van Hagen, 2011). Omgevingsinvloeden kunnen van invloed zijn op de gevoelens van veiligheid (Johansson, Rósen & Küller, 2011). Reizigers die gevoelens van sociale onveiligheid ervaren op het station, zullen vermijdingsgedrag gaan vertonen (Blöbaum & Hunecke, 2005).

Verlichting kan gevoelens van veiligheid versterken (Johansson, Rósen & Küller, 2011). Wanorde in een omgeving heeft daarentegen een negatieve invloed op sociale veiligheid (Duineveld, 2010). Daarnaast trekt wanorde in een omgeving ook meer wanorde en vandalisme aan (Keizer, Lindenberg & Steg, 2008). Dit heeft vervolgens weer een negatieve invloed op de gevoelens van veiligheid in de omgeving. Uit onderzoek van Molenaar (2010) blijkt echter dat de verlichting van rommel ertoe leidt dat wanorde als minder opvallend wordt ervaren. Er lijkt dus een complexe interactie tussen verlichting, wanorder en sociale veiligheid te bestaan. In dit onderzoek wordt deze relatie onderzocht. De variabelen 'type reiziger', 'controle', 'overzicht', en 'perceptie van drukte' zijn in dit onderzoek meegenomen, omdat uit de literatuur is gebleken dat deze invloed hebben op gevoelens van veiligheid.

In dit onderzoek hebben 150 deelnemers een slideshow van een perron bekeken, waarbij de factoren verlichting, rommel en type reiziger varieerden. Vervolgens werden sociale veiligheid, overzicht, controle en gepercipieerde drukte gemeten. Er is gebruik gemaakt van een 2 (verlichtingsconditie: donker perron vs. licht perron) x2 (reizigerstype: mustreiziger vs. lustreiziger) x2 (wanordeconditie: orde vs. wanorde) MANOVA.

Deze resultaten bleken niet significant. De ANOVA laat een positieve relatie zien tussen de perceptie van verlichting en sociale veiligheid, die gemedieerd wordt door overzicht. Deelnemers in de lichtconditie voelden zich veiliger in de wanordeconditie dan in de ordeconditie. Mustreizigers in de gecombineerde donkere- en wanordeconditie voelden zich minder veilig dan reizigers in andere condities. Sociale veiligheid en overzicht bleken toenaderingsgedrag positief te beïnvloeden. Controle en waargenomen wanorde hadden een positieve invloed op de evaluatie van het perron. Door het gebrek van significante resultaten van de MANOVA kunnen de resultaten van de ANOVA echter veroorzaakt zijn door toeval.

III Voorwoord

Voor u ligt mijn masterthese. Deze is niet zonder slag of stoot tot stand gekomen. Ik ben blij met het uiteindelijke resultaat. Dit had ik alleen niet voor elkaar gekregen. Er zijn een aantal mensen die ik voor hun hulp wil bedanken. Allereerst wil ik mijn begeleiders Peter en Mirjam bedanken. Zij hebben me geholpen om de hoeveelheid informatie te structureren en af te bakenen. Daarnaast wil ik Sanne de Kinkelder bedanken. Het was fijn om samen de dataverzameling te kunnen doen. Samen buiten op de stoeltjes wachten tot de vragenlijst is ingevuld, is toch een stuk leuker dan alleen. Ik heb mijn these in het Engels geschreven. Ik wil Desirée Snoek bedanken voor het nalezen van mijn verslag. Het is goed om te weten dat personen niet 'unconscious' (bewusteloos), maar 'subconscious' (onbewust) van de invloed van omgevingsfactoren zijn. Ook Randy Klaassen wil ik bedanken voor de vele ontbijtjes, kopjes koffie en tips.

Ik wil mijn ouders bedanken, omdat ze mij altijd hebben gesteund in mijn keuzes en oprecht geïnteresseerd zijn in waar ik mee bezig ben; mijn zus Marjon, die meteen duidelijk maakte dat mijn onderzoek niet alles omvattend was: "nou licht en rommel hebben heus niet alleen invloed, die vrolijke bomen op het perron doen ook een heleboel"; en mijn broertje Jaco, die meerdere laptopreddingspogingen ondernomen heeft en uiteindelijk uit pure wanhoop zijn oude laptop ter beschikking van de wetenschap gesteld heeft. Sebastiaan wil ik bedanken, omdat hij, hoewel hij niet "gelooft in psychologie", de hoop voor mij nog niet heeft opgegeven. Als laatste wil ik mijn tante Ria bedanken. Zij heeft vanaf het begin mijn onderzoeksopzet van commentaar voorzien en was altijd heel geïnteresseerd in alles waar ik mee bezig was. Al voordat ik begon met de data-analyse gaf ze me tips over het door mij gevreesde SPSS. Wat had ze het leuk gevonden om tijdens mijn presentatie daar vragen over te stellen en wat is het ongelofelijk jammer dat ze er niet meer bij kan zijn.

Mijn masterthese is de afronding van mijn studie. Ik kan niet wachten om te ontdekken wat er hierna gaat gebeuren en hoe ik de psychologie in mijn werk kan gaan toepassen.

Laura Vos

1. Introduction

Keeping the passengers and employees safe is of utmost importance to both the Dutch Railways (Nederlandse Spoorwegen, NS) and ProRail. The NS has the mission to transport more passengers safely, on time and comfortably via appealing railway stations every year (Annual report NS, 2011). The objective of NS Stations related to this mission is to create and keep appealing, well organized, safe and durable railway stations. In 2011 the NS invested 100 million euro to enhance the safety of the passengers, both at the platform and during the time they spend on the train. By improving the waiting experience at the railway station platform, the NS hopes to contribute to a more positive customer evaluation of the railway station.

The customer desire pyramid was developed to represent the needs of passengers (Van Hagen, 2011. This pyramid can be used to create a waiting environment that fits the needs of the passengers. Van Hagen (2011) identified safety as the most important layer of the customer desire pyramid. Van Hagen argues that passengers need to feel safe in order to feel at ease waiting at a platform.

Studies show that people often feel unsafe in public transportation areas. The Dutch Social Cultural Planning office found in 2006 that 26 percent of the public experienced feelings of unsafety in public transportation during the day. This number even rises to 62 percent during night time. This underlines the importance of lighting with regard to feelings of safety at a railway station platform. Johansson, Rosén and Küler (2011) found that lighting that is bright, distributed evenly, and monotone produced the highest feelings of safety.

In addition, ProRail states that a clean platform contributes to an enhanced feeling of safety for the waiting passengers. The impact of disorder in a public space is frequently discussed in scientific literature (e.g. Wilson & Kelling, 1982; Keizer, Lindenberg, & Steg, 2008). Wilson and Kelling (1982) first describe *"the broken window theory"* which claims that an environment that shows signs of disorder and petty criminal behavior (e.g. graffiti, broken windows and litter) causes people in that environment to litter more and show petty criminal behavior. Signs of disorder, Wilson and Kelling (1982) argue, act as a trigger for people to violate the general rules and norms. By removing signs of disorder, this trigger will be removed, and thus people will be less inclined to litter or to act out petty criminal behavior. Prevention of litter and broken objects at the railway station platform could thus influence the

actual safety of waiting passengers, and also influences the feelings of social safety of waiting passengers.

Although both the influence of lighting on social safety and the influence of disorder on social safety are well established (e.g. Johansson, Rósen, & Küller, 2011; Keizer, Lindenberg, & Steg, 2008; Van Hagen, 2011), the interaction of these factors is not that well known. This study hopes to explore this relationship. This leads to the following main research question:

"What is the influence of lighting and disorder at the railway station platform on passengers' feelings of safety, control, uncertainty, overview, and spaciousness, and how does it influence the evaluation of the platform?"

To find the answer to this research questions, this study will examine the effects of the elements lighting and disorder on the passenger feelings at the platform and the evaluation of the platform of the railway station Eindhoven Centraal in an experimental laboratory study.

2. Theoretical Framework

This theoretical framework will discuss the literature findings with regard to the influence of lighting and disorder on the perception of safety of a railway station platform.

2.1 Social safety

Social safety is an important element necessary for passengers to feel comfortable at the platform during their wait (Van Hagen, 2011). A distinction can be made between actual safety and the perception of safety. The actual, or objective, safety at a railway station platform and the perceived, or subjective, safety at the platform often do not correspond (Ennis, 1967, as seen in Van 't Hof, 2008). Thus, not only the degree of actual social safety is of importance; also the perception of the degree of social safety is important in the evaluation of social safety. People that experience feelings of unsafety, experience anxiety state reactions, coping, and avoidance behavior (Blöbaum & Hunecke, 2005). People will choose not to travel by public transportation if they do not feel safe in the public transportation environment (Van 't Hof, 2008).

Before social safety at platforms is discussed in detail, first the definition of social safety will be described. This study will use the definition of social safety of Fijnaut and Zaat (2003). This definition entails both elements with regard to objective social safety and elements regarding subjective social safety. Social safety consists of three elements:

1. *Feelings of unsafety experienced by an individual;*
2. *The nuisance an individual experiences in public places that is directly caused by other people;*
3. *Crime that directly affects an individual, the integrity of an individual or the properties of an individual.*

In addition to feelings of unsafety caused by crime, this definition entails feelings of unsafety caused by inconvenient elements in the environment like disorder, deterioration and decay of the environment (Fijnaut & Zaat, 2003). Examples of this are stench, litter and graffiti.

Oppelaar and Wittebrood (2006) describe three factors that contribute to feelings of social unsafety. These three factors are: individual elements such as personality traits and victimization experiences; social cultural elements such as individualism and the media attention with regard to social unsafety; and most important in this study, elements in the

situational context. In the situational context Oppelaar and Wittebrood (2006) further distinguish two factors within the situational context. The first factor of the situational context is the interior design, which entails: layout, the degree of overview in an environment, and lighting and darkness in the environment. The second factor of the situational context is the degree of disorder in an environment. This entails: littering, graffiti, and demolitions in an environment. Therefore, the elements lighting and disorder are discussed next.

2.2 Lighting

Lighting is considered to be an ambient environmental element. Galetzka, De Vries, Hulshof and Koeman (2012) describe atmospherics as: *"The effects the use of colour, music, lighting, and sound has on consumer behavior. Atmospherics is a concept from the environmental psychology and refers to environmental factors that can influence consumer evaluations and behaviours"*.

Light consists of different dimensions. The dimension used in this study is the *illuminance*. The illuminance is the intensity of the light and is measured in lux (Peters, 2008).

The lighting in an environment influences the way people feel in that environment. Using appropriate lighting in an environment can contribute to positive affect (Baron, Rea & Daniels, 1992). In addition, lighting is necessary to make an environment visible and contributes to the degree of overview in that environment. By facilitating visibility and overview, the lighting in a space helps people to achieve their goals (Johansson, Rosén & Küller, 2011). A study of Antonakaki (n.d.) has shown that high intensity lighting contributes to orientation and makes it easier for individuals to find their way. This in turn increases feelings of social safety. Johansson, Rosén and Küller (2011) have shown that passengers feel most safe in an environment that is bright and evenly distributed in the environment. The findings in the literature lead to the following hypotheses:

Hypothesis 1a: A positive effect of lighting at the railway station platform on feelings of social safety exists, which is mediated by overview.

Hypothesis 1b: A positive effect of lighting at the railway station platform exists on the overall evaluation of the platform.

2.3   Disorder

A study from Baggerman, Van Zee and Van 't Rot (2008) showed that passengers considered a clean railway station platform as one of the most important features to contribute to a positive waiting evaluation on the platform. Disorder in the environment has different negative influences on people in that environment. In the evaluation of disorder the concepts of load and load-taking capacity are important.

Eysink Smeets (2007) describes that the evaluation of litter is a subjective evaluation. An environment is only interpreted as disorderly if the load of the inconvenience caused by the disorder exceeds the load-taking capacity of the individual. One person might evaluate a platform as littered while someone else might not. The effects of disorder in public places has been researched by Wilson and Kelling (1982) and Keizer, Lindenberg and Steg (2008).

Wilson and Kelling developed *"the broken window theory (BWT)"*. The broken window theory states that an environment that shows signs of disorder and petty criminal behavior increases the chance that people in that environment behave accordingly, thereby causing more disorder and petty criminal behavior. The BWT was scientifically proven by Keizer, Lindenberg and Steg in 2008. In addition, they also offer an explanation for the broken window theory. They argue that the social norm a person perceives in an environment influences the behavior a person shows.

The social norm can be divided into a descriptive norm and an injunctive norm (Keizer, Lindenberg & Steg, 2008). The injunctive norm is a general opinion of a specific behavior. An example of an injunctive norm is: 'no-one should steal'. The descriptive norm on the other hand, shows how people act in a specific situation. When, for example, a street is profusely littered, this shows that the descriptive norm in that environment is to litter. This in turn increases the probability that someone will litter in that environment. The reason for this is that the descriptive norm shows that other people litter, so it probably is the right decision to litter in that situation.

Keizer, Lindenberg and Steg (2008) argue that the two norms enhance each other when they are in accordance with each other. The norms can also be in conflict with each other. People usually feel the need to conform to an injunctive norm because they want to behave properly in an environment. In addition, hedonic and selfish interest play an important part in the behavior someone chooses to portray. These two factors, the need to conform to an injunctive norm and selfish needs can be in conflict. The choice for a specific behavior can be influenced by the strength of the needs. When a specific need is strong, the chance someone

exerts that specific behavior is enhanced. When people are reminded of a specific need, this need is triggered more, and the chance that someone acts according to that need increases (Keizer, Lindenberg & Steg, 2008).

Thus, people do not exactly copy the actions seen in an environment, but the signs in the environment can trigger one of the two norms. In a littered environment the trigger the environment holds increases the wish to behave selfish and decreases the wish to conform to an injunctive norm. This in turn can lead people to cause more disorder or to act out petty criminal behavior. Keizer, Lindenberg and Steg (2008) call this *"cross-norm inhibition"*. This in turn has an influence on the evaluation of social safety.

Feelings of social safety are negatively influenced by signs of disorder (Duineveld, 2010). Signs of disorder in an environment will lead to more disorder in this environment, which in turn will lead to higher feelings of unsafety in that environment (Duineveld, 2010). Therefore, signs of disorder in an environment cause a negative chain-effect on feelings of unsafety (Duineveld, 2010). Disorder is a situational factor that negatively influences feelings of social safety (Oppelaar & Wittebrood, 2006).

The influence lighting has on the evaluation of a disorderly environment is researched by Molenaar (2010). Molenaar found that disorderly situations where extra lighting was applied were evaluated as cleaner than disorderly situations where less lighting was applied, even though in the situation where extra lighting was applied the litter in the environment was more visible than in the environment that was not lighted. It would seem reasonable that an environment where disorder is extra visible is evaluated as more littered, but the opposite seems to be true (Molenaar, 2010). Molenaar offers an explanation for this by stating that people expect that the littered environment that is brightly lit will be quickly cleaned, because of the visibility of the litter.

The influence of bright lighting on petty criminal behavior is also discussed in the review of Molenaar (2010). Molenaar states that only the parts in the environment that are littered become more littered, and that the parts that were clean remained clean, even when the adjacent environment was littered. Thus, in littered environments that are well-lit, the litter accumulates only in those places that are already littered while the clean adjacent areas remain clean. So, not only the disorder in an environment is reinforced, the cleanliness of an environment is also reinforced.

To summarize: both improved lighting and improved order in an environment can contribute to a better evaluation of the platform and the social safety on the platform, and these two factors can possibly reinforce each other. This leads to the following hypotheses:

Hypothesis 2a: Lighting at the railway station platform will decrease the evaluation of litter at the platform.

Hypothesis 2b: Disorder at the railway station platform will decrease passengers' feelings of social safety of the passengers at the platform.

Hypotheses 2c: Disorder at the railway station platform will negatively influence the overall evaluation of the platform.

2.4   Type of passenger

Different types of passengers exist. A distinction can be made between passengers who are familiar on the railway station platform, and passengers who are not. These different types of passengers react differently to the railway station platform with regard to uncertainty and control (Van Hagen, 2011). Therefore, the different types of passengers are discussed.

Incidental passengers are those passengers that do not travel by train often, and thus are not familiar with the railway platform. This can cause uncertainty for the passenger (Van Hagen, 2011). There is a certain level of uncertainty that passengers face while waiting on the platform. This is especially true when trains are delayed or departure tracks are changed. Incidental passengers experience more uncertainty, while frequent passengers feel more in control at a railway station platform (Van Hagen, 2011). Bright lighting can increase feelings of control (Johansson, Rósen & Küller, 2011).

Frequent passengers are those passengers who travel by train often, and are familiar with the platform. Blokland (2009) found that public familiarity with an environment enhances the perception of social safety. Public familiarity is the concept of people knowing the surroundings of an environment and the people in that environment. This public familiarity makes an environment more predictable. This in turn leads people to feel more at ease and safe in an environment (Blokland, 2009). This might also be applicable to the railway station environment. Familiarity with the platform might positively influence feelings of social safety.

Passengers can also be distinguished from each other by the passengers' goals. Must passengers are individuals who are focused, systematic, and goal and time orientated. These passengers mainly travel by train to get to work or college. Lust passengers on the other hand

are individuals who value the experience the train journey has to offer. These individuals travel by train to visit friends or family or go on a trip, and feel the journey is a part of the experience of their day out. Literature suggests that must passengers prefer bright lighting because of its functionality (Galetzka et al., 2012). Baron, Rea and Daniels (1992) however suggest that dimmed lighting will make people feel more pleasant. Must passengers are also found to be more irritated and discontented with unexpected findings at the platform than lust passengers (Machleit, Eroglu & Powel Mantell, 2000).

This leads to the following hypotheses:

Hypothesis 3a: Lighting at the railway station platform will positively influence the passengers' perceived control at the platform.

Hypothesis 3b: Bright lighting at the platform will positively influence the evaluation of the platform for must passengers, while dimmed lighting at the platform will positively influence the evaluation of the platform for lust passengers.

Hypothesis 3c: Disorder will influence the evaluation of the platform more negative for must passengers than for lust passengers.

Hypothesis 4: Familiarity with the railway station platform will positively influence passengers' feelings of social safety at the platform.

2.5   Control

Feeling in control in an environment is an important factor that increases feelings of safety for passengers waiting at the railway station platform. Environmental control is the degree in which an individual feels he or she can influence the environment for the better (Van Hagen, 2011). The definition of control used in this study is the definition given by Ward and Barns (2001): *"An individual's believes, at a given point in time, in his or her ability to effect a change, in a desired direction, on the environment.".*

Hui and Bateson (1991) describe three types of control: behavioral control, cognitive control, and decisional control. Behavioral control is the "availability of a response which may directly influence or modify the objective characteristics of an event". Cognitive control is "the predictability and cognitive reinterpretation of a situation" and decisional control is

"the choice in the selection of outcomes or goals" (Hui & Bateson, 1991). The presence of litter at a railway station platform might influence the decisional control of passengers. Passengers prefer a clean platform (Baggerman, Van Zee & Van 't Rot, 2008), so when the platform is littered or shows signs of petty criminal behavior, people feel less comfortable, but are unable to change the environment that leads to this uncomfortable feeling. This might lead to diminished feelings of control.

The influence that control has on psychological and physiological well-being is well established in the literature (e.g. Averill, 1973, Hui & Bateson, 1991). Loss of control in an environment can lead to stress (Averill, 1973). Ward and Barnes (2001) found that a lack of control leads to passive acceptance of the environment, which in turn leads to feelings of helplessness, powerlessness and avoidance behavior. Feelings of helplessness and powerlessness may in turn influence feelings of unsafety in an environment. In addition, loss of control leads to distress and anxiety (Hui & Bateson, 1991), which also may influence feelings of unsafety.

In contrast, feelings of control might enhance feelings of social safety. Someone feels in control when he or she can influence the surrounding environment. Hui and Bateson (1991) showed that improved control leads to improved pleasure and more approach behavior. Taken together, these findings in the literature lead to the following research hypotheses:

Hypothesis 5a: Perceived control at the railway station platform will positively influence feelings of social safety at the platform.

Hypothesis 5b: Disorder at the railway station platform will negatively influence passengers' perceived control at the platform.

2.6   Overview

Overview is an important aspect at railway station platforms. Good overview makes it easier for passengers to obtain their goals. Van 't Hof (2008) describes the advantages of good overview: "Overview enhances visible performance and enables individuals to scan their environment for potential dangers.". Lighting especially is related to overview, because good lighting enhances visibility, and that in turns enhances overview (Van 't Hof, 2008).

Lack of overview can be caused by crowding, obstacles that block the view, or poor lighting conditions. The herding effect is the effect that passengers follow other passengers on

the platform. This especially occurs when passengers are unfamiliar with the platform, or feel insecure or unsafe. Herding causes more obstructions at the platform because the waiting passengers follow each other, and thereby do not use all the available space on the platform, entrances and exits. The herding effect seems to occur less in an environment that offers good overview and where passengers can orientate themselves well. Enhanced overview thus can stimulate the use of the entire platform, instead of all passengers gathering in the same spot.

2.7   Spaciousness

Spaciousness and the flow at the platform are also of great importance to the perceived safety at the platform. Obstructions hinder the flow at the platform. Passengers often stay at the platform near the exits, entrances and stairs (Galetzka et al, 2012). This can cause obstructions. Obstructions cause passengers to experience negative affect; passengers feel uncomfortable, frustrated, and worry about the safety at the platform (Lee, Lam & Wong, 2001). There are some findings in the literature that might offer a solution to these problems. Helbing, Buzna, Johansson and Werner (2005) conclude that lines painted on a street enhance the flow at intersections. The use of lines and stripes to improve flow could well be applicable at platforms. Lighting also might improve flow by attracting passengers to the far ends of the platform. This in turn could diminish crowding.

Crowding is the evaluation of the density in an environment. Machleit, Eroglu and Mantel (2000) describe crowding as the perception of an individual that *"the number of people or objects, or both, in a limited space restricts or interferes with the individuals' activities and goal achievement"* (Machleit, Eroglu & Mantel, 2000). Crowding consists of two elements: the element of social crowding and the element of spatial crowding. Spatial crowding is the perceived crowding caused by nonhuman components in the environment (Machleit, Eroglu & Mantel, 2000), such as pillars, benches and departure signs on the platform. Social crowding on the other hand, concerns crowding caused by other people and social interactions in an environment (Machleit, Eroglu, & Mantel, 2000), such as other people and groups of people waiting at the railway station platform. The perception of crowding is an individual evaluation of the environment. While some people may consider an environment as crowded, others might not. Experiencing feelings of crowding can lead to a number of negative feelings, such as stress and diminished social safety (Cox, Houdtmont & Grifftiths, 2006).

Crowding is related to social safety (Cox, Houdmont, & Grifftihs, 2006). Cox, Houdmont and Griffiths (2006) argue that specific types of crime might be more likely to take place in crowded places. For example, verbal and physical abuse and petty crime like pick pocketing and vandalism might be correlated with crowding. This leads to the following hypothesis:

Hypothesis 6: Perceived crowding at a railway station platform negatively influences passengers' feeling of social safety at the platform.

2.8   Conceptual model

This conceptual model is based on the stimulus-organism-response (SOR) model developed by Mehrabian and Russell (1974). This SOR model describes three aspects that together determine a reaction on a specific stimulus. The first aspect in this model is the stimulus itself: in this case the environmental factors lighting and disorder. Babin, Harthesty and Sutter (2003) showed the importance of the fit between the environment, in this study the railway station platform, and the needs of the individual, in this study the waiting passengers. When there is a discrepancy between the environment and the needs of a person, people develop negative affect towards the situation and show less approach behavior, or even avoidance behavior. Passengers thus feel less comfortable in an environment that does not meet their needs. When the elements in an environment meet the needs of a passenger this leads to positive affect. Subsequently, this leads to a more positive evaluation of the railway station and approach behavior (Babin, Harthesty, & Sutter, 2003).

The second factor of the SOR model is the organism, the person that reacts to the stimulus with his or her cognitive, emotional en physiological reactions. In this study feelings of social safety, overview and spaciousness are taken into account.

The third factor is the respons: the behavior of an individual that follows in reaction to the stimulus. This study will examine the responses, consisting of choice of waiting area, overall evaluation of the platform, and avoidance versus approach behavior. The model is presented below.
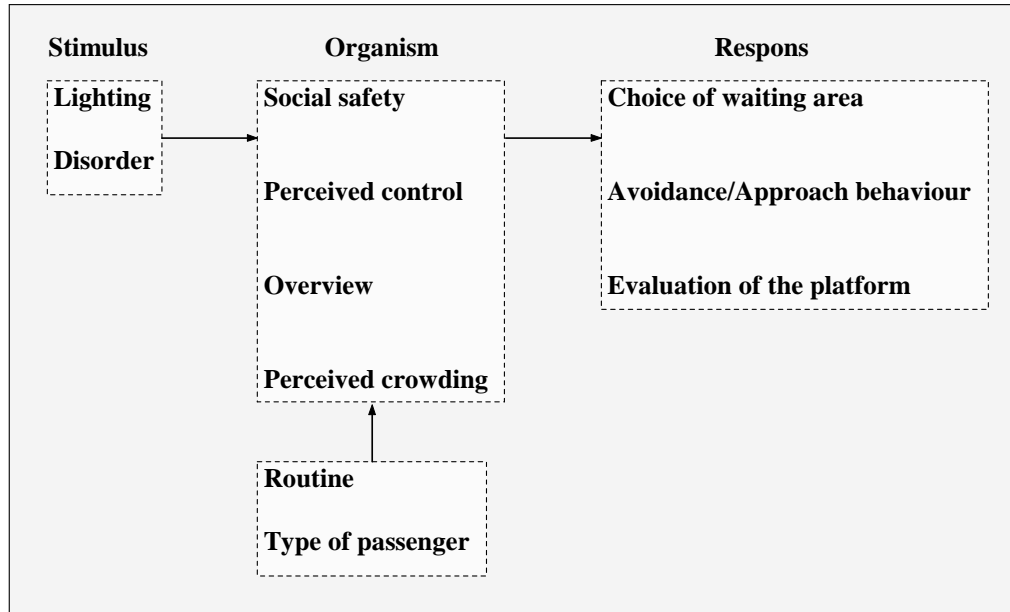
Figure 2.1: Conceptual model.

3. Method

3.1 Participants and design

An experimental study was conducted to test the research hypotheses. In this study, lighting at a railway station platform and disorder at a railway station platform were manipulated independently and their effects on the feelings of safety of the waiting passengers and behavioral responses were examined. A laboratory study was conducted using video material to study the effects of lighting and disorder on the evaluation of a railway station platform. The hypotheses proposed in the theoretical framework were tested with a 2 (lighting condition: dark platform versus light platform) x2 (type of passenger: must passenger versus lust passenger) x2 (type of disorder: order versus disorder) between subjects MANOVA.

In total, 152 participants returned the questionnaire (70 male, 80 female, 2 missing values). The distribution of the participants over the different conditions can be found in table 3 in Appendix E. The age of the participants ranged from 18 to 74 years old. The mean age of the participants was 25.5 ($M = 25.5$, $SD = 9.83$). 66.6% of the participants were experienced train travelers and travelled at least 3 days a month by train. 20.7% of the participants were familiar with railway station Eindhoven, which photos were used in the slideshow. The descriptive data of the participants can be found in table 1 in Appendix E.

3.2 Procedure

This study used a convenience sample. Students of the University of Twente, friends and family were asked to participate in a study about railway stations evaluations. All students could receive extra course credit for participating.

Written scenarios were employed to operationalize the travel treatments. Subjects that agreed to participate were asked to go into a lecture room where they were randomly assigned to read either the *lust passenger-scenario* or the *must passenger-scenario*. The scenarios that were used in this study can be found in Appendix A. The participant had to imagine he or she was the person in the scenario. The must passenger-scenario outlined a situation in which someone, who travelled by train often, had to travel by train to get to an important appointment in time. The lust passenger-scenario outlined a situation in which someone, who normally does not travel by train, decides to visit family by train.

After reading one of the scenarios, the participant watched a short video. Participants had to imagine they were waiting on the platform as shown in the slideshow. There were two slideshow conditions. The participants were randomly assigned to one of these conditions. In the first condition participants watched a short slideshow of someone waiting and walking across a railway platform during twilight without artificial lighting. In the second condition, participants watched a number of slides of someone waiting on a railway platform during twilight, with artificial lighting at the end of the railway station platform. The environment was lit by lighting spots at the platform. The lighting was the only difference in the slides conditions, presence of other people, waiting time and other environmental factors were kept constant. Hui and Bateson (1991) describe that prior studies have proved that slides can adequately represent the environment (e.g. Hershberger & Cass, 1974).

In addition to these slideshow conditions, the room in which the participant watched slides was either littered with coffee cups, tissues and candy wraps, or was free of litter. Participants were randomly assigned to either the clean or the littered condition. After watching the slides, participants were asked to fill in a questionnaire. This questionnaire can be found in Appendix C. The constructs in the questionnaire are discussed in more detail below. The constructs belonging to the questionnaire can be found in Appendix B. After finishing the questionnaire participants were briefed and thanked for participating.

3.3   Manipulation checks

Disorder was measured in the section measuring overall attitude towards the railways station platform, and consisted of three items. Sample items measuring perceptions of disorder on the platform were: *'This railway station platform is littered'* and *'This railway station platform is kept in good condition'*. Cronbach's alpha for this scale was .72. Important to note is that while the testing room was littered, the railway station platform in the slides was not. Therefore, it is important to keep in mind that the participants were instructed to imagine they were standing on the platform while watching the slides. The aim of littering the testing room was that the participants transferred their perception of the litter in the testing room to the evaluation of the litter at the railway station platform.

Lighting was measured by three items concerning the perception of the lighting on the railway station platform. This scale was adopted from Peters (2008). A five point semantic differential scale was used. Sample items are: *'The lighting at the platform was: very dark(1) –very light(5)'* and *'The colours at the platform were: very grey(1)- very colourful(5)'*.

Reliability for the scale measuring the lighting at the beginning of the railway station platform was .53. Splitting this scale into a scale measuring the colour on the platform and a single item measuring the lighting on the platform improved the reliability of the scale measuring colour to .76. Reliability for the scale measuring lighting at the end of the railway station platform was .74. Splitting the scale into a scale measuring colour on the platform and a single item measuring the lighting improved the reliability of the colour scale to .83. Lighting at the end of the platform was measured by a single item.

3.4   Dependent measures

To investigate whether participants had a preference for a specific waiting area at the platform, the questionnaire started by showing the participants 4 stills of the slideshow they watched. Then participants were asked to select the picture they would choose to wait at the platform. The stills used to show the participants can be found in Appendix D.

Another dependent measure, social safety, was measured by five items consisting of a five point Likert scale ranging from 'totally disagree' to 'totally agree'. Items were adopted from Taylor (1994). Examples of the items measuring social safety are: *'On this platform I feel insecure'; 'On this platform I feel safe'* . To avoid response bias, the direction of some of the items in this scale was reversed. Cronbach's alpha for this scale was .84. Perceived control was measured using four items consisting of a five point Likert scale ranging from 'totally disagree' to 'totally agree'. Sample items are: *'On this platform, I feel in control over the situation'* and *'On this platform I can easily find what I am looking for'*. Cronbach's alpha for this scale was .66. Although this is a low reliability, the reliability of this scale could not be improved by removing one of the variables. Therefore, the scale was used in its original form.

Overview was measured using a five point Likert scale consisting of nine items. The Likert scale ranged from 'totally disagree' to 'totally agree'. The items measuring overview were retrieved from Van 't Hof (2008) and Sauren (2010). Examples are: *'I find this railway station platform well-arranged'* and *'This railway station platform has a lot of dark areas'*. To avoid response bias, the direction of some of the items in this scale was reversed. Coefficient alpha for this scale was .80.

The scale measuring perceived crowding contained four items retrieved from Machleit, Kellaris and Eroglu (1994). A five point Likert scale ranging from 'totally disagree' to 'totally agree' was used. Sample items measuring perceived crowding are: *'I find this railway station platform to be overcrowded'* and *'There were too many people present on this*

railway station platform'. To avoid response bias, the direction of some of the items in this scale was reversed. The Cronbach's alpha of the perceived crowding scale was .65. By removing the item *"There were too many people present on this railway station platform"*, the reliability of this scale was improved to .82.

The overall attitude concerning the railway station platform was measured by eight items retrieved from a questionnaire of the Dutch Railways (Van Hagen, 2011). Some of these items measured the perception of disorder on the platform. Sample items of the overall attitude are: *'This railway station platform is attractive'* and *'This railway station platform is comfortable'*. Coefficient alpha for the overall attitude of the platform was .85.

Another section of the questionnaire containing questions measuring a dependent measure was the scale considering approach and avoidance behavior. This scale, adopted from Peters (2008) and complemented with items with regard to feeling at ease at the railway station platform was included as measure of approach and avoidance behavior. A five point Likert scale was used to answer these items. Cronbach's alpha of this scale was .67. The reliability of this scale was improved by removing the item: *"I would explore the railway station platform"*, to .72.

4.   Results

4.1 Manipulations

4.1.1   Lighting

An independent samples t-test showed that participants did not evaluate the railway station platform with lighting at the end as lighter than the railway station platform without lighting, either at the beginning of the platform ($t = 2.57$, *ns.*), or at the end of the platform ($t = -2.39$, *ns.*).

Although the dark and light railway station platform were not evaluated differently concerning lighting; the beginning and the end of each individual platform is evaluated different. In both the light condition ($M_{beginning} = 2.61$, $SD = 0.76$ versus $M_{end} = 3.68$, $SD = 0.85$, $t = -8.37$, $p = 0.00$) and in the dark condition ($M_{beginning} = 2.95$, $SD = 0.83$ versus $M_{end} = 3.33$, $SD = 0.93$, $t = 2.59$, $p = 0.01$) the end of the platform is evaluated as more light.

4.1.2   Disorder

An independent samples t-test showed that participants did not evaluate the platform as more littered in the littered condition than in the clean condition ($t = 0.81$, *ns,*). Another t-test found that participants did not have a different overall attitude toward the railway station platform in the littered condition or the clean condition ($t = 0.78$, *ns.*). This indicates that the participants did not use the evaluation of the testing room in their evaluation of the platform.

4.1.3   Choice of waiting area

No significant differences were found between the choice of waiting area for the participants in the dark condition and in the light condition ($\chi^2 (3) = 2.91$, *ns.*). Both in the dark and light condition participants most often chose to wait either at the beginning of the platform, or at the far end of the platform (image A and image D respectively, as can be found in Appendix C).

There also proved to be no significant difference in choice of waiting area between must passengers and lust passengers ($\chi^2 (3) = 0.78$, *ns.*). Again, must passengers as well as lust passengers preferred to wait at either the beginning of the platform (image A) or at the far end of the platform (image D). In addition, there seemed to be no significant difference in choice of waiting area for the order condition and the disorder condition ($\chi^2 (3) = 3.12$, *ns.*). Passengers in both the order and the disorder condition preferred to wait at the beginning of

the platform (image A) or at the far end of the platform (image D). An analysis of the data revealed that only one significant difference was found. Lust passengers in the disorder condition significantly chose other waiting areas in the dark condition than in the light condition (χ^2 (3) = 10.50, p = 0.02). The data suggests that the difference with the other participants is that the lust passengers in the combined disorder and dark condition do not choose waiting area D as their preferred waiting area, but choose waiting area A. Lust passengers in the combined disorder and light condition on the other hand do choose waiting area D as their preferred waiting area, together with waiting area A. An overview of the waiting area choices respondents made can be found in table 4.1.

Table 4.1: Overview of the waiting area choices of the respondents.

			Choice of waiting area							
			A		B		C		D	
			N	%	N	%	N	%	N	%
Order	Must	Dark	8	38.1	1	4.8	6	28.6	6	28.6
		Light	8	30.8	2	7.7	10	38.5	6	23.1
	Lust	Dark	9	30.0	3	10.0	6	20.0	12	40.0
		Light	7	25.9	2	7.4	9	33.3	9	33.3
Disorder	Must	Dark	3	25.0	2	16.7	1	8.3	6	50.0
		Light	5	35.7	1	7.1	3	21.4	5	35.7
	Lust	Dark	6	60.0	1	10.0	2	20.0	1	10.0
		Light	0	0.0	1	10.0	2	20.0	7	70.0

4.2   Analyses of variance

By performing multivariate between subjects analyses of variance, the relationship between the factors in the conceptual model was tested.

Multivariate between subjects analysis of variance showed no significant main effect existed for lighting condition (F (11, 132) = 0.55, *ns.*, Wilks' Lambda = .96). Also no significant main effect was found for disorder condition (F (11, 132) = 0.50, *ns.*, Wilks' Lambda = .96). No significant main effect was found for type of passenger (F (11, 132) = 0.96, *ns.*, Wilks' Lambda = .93).

Next, the interaction effects were studied. No significant interaction effects existed for the interaction between lighting condition and disorder condition (F (11, 132) = 1.00, *ns.*, Wilks' Lambda = .92). Also, no significant interaction effects were found for the interaction between lighting condition and type of passenger (F (11,132) = 1.15, *ns.*, Wilks' Lambda = .91). In addition, the interaction between type of disorder and type of passenger also proved not significant (F (11, 132) = 0.83, *ns.*, Wilks' Lambda = .91). The last interaction effect was

the three-way interaction between lighting condition, disorder condition and type of passenger. This interaction was not significant (F (11, 132) = 1.12, *ns.*, Wilks' Lambda = .91).

The multivariate analysis of variance thus did not result in significant findings. Next a univariate between subjects analysis of variance was performed to find answers to the hypotheses. Because of the lack of significant findings in the multivariate analysis of variance, the results of the univariate analyses of variance should be examined with caution. These findings could be the result of chance.

Hypothesis 1b proposed that lighting at a railway station platform would enhance the overall evaluation of the platform. Results showed that no significant main effect existed for type of lighting with regard to the evaluation of a railway station platform (F (1, 142) = 0.15, *ns.*). Also, no interaction effects were found for type of disorder and type of lighting (F (1, 142) = 0.25, *ns.*), type of passenger and type of lighting (F (1, 142) = 0.95, *ns.*), and type of passenger, type of disorder and type of lighting (F (1, 142) = 0.42, *ns.*) with regard to evaluation of the platform. Hypothesis 1b therefore should be rejected.

Hypothesis 2a proposed that lighting diminishes the evaluation of litter at a railway station platform. No main effect for lighting with regard to evaluation of litter at the railway station platform was found (F (1, 142) = 0.00, *ns.*). Also, no significant interaction effect was found for type of lighting and type of disorder (F (1,142) = 0.25, *ns.*), for type of lighting and type of passenger (F (1, 142) = 0.03, *ns.*), and for type of lighting, type of passenger and type of disorder (F (1, 142) = 0.44, *ns*) regarding the evaluation of litter at the platform. Hypothesis 2a should be rejected.

Hypothesis 2b stated that disorder in a railway station environment diminishes feelings of safety. No main effect was found for type of disorder with regard to feelings of social safety (F (1, 142) = 0.30, *ns.*). The interaction between type of disorder and lighting condition was marginally significant (F (1, 142) = 3.58, p = 0.06). Planned comparisons showed that participants in the dark condition did not respond to differences in the type of disorder with regard to social safety (F (1, 146) = 0.85, *ns.*), whereas for participants in the light condition the difference between type of disorder was marginally significant with regard to the scores on social safety ($M_{disorder}$ = 3.88, SD = 0.12 versus M_{order} = 3.63, SD = 0.08; F (1, 146) = 2.83, p = 0.09). This interaction effect is plotted in figure 4.1.
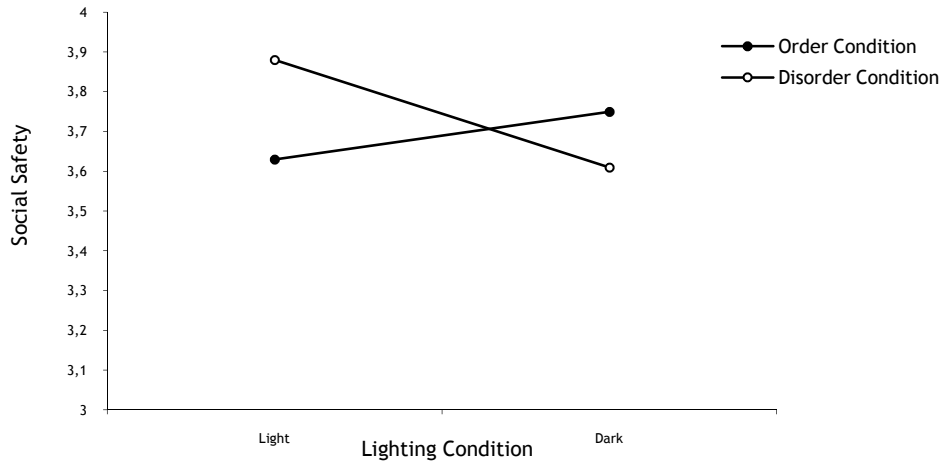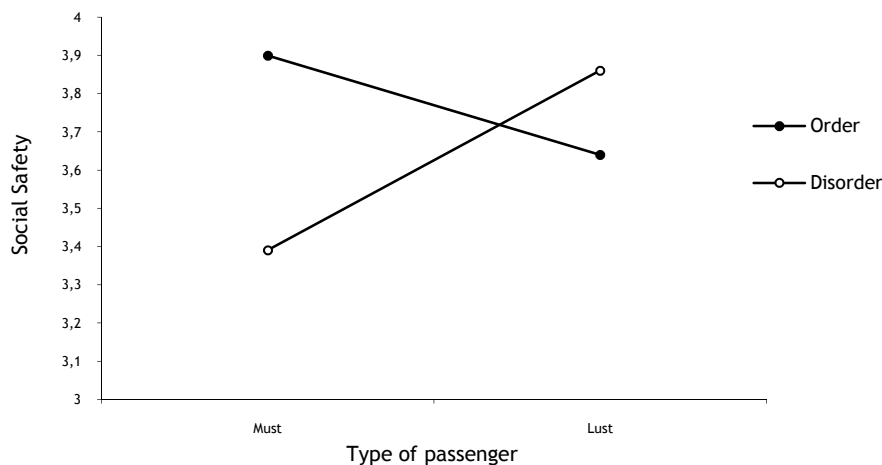
Figure 4.1: Interaction effect between lighting condition and disorder condition with regard to social safety.

No significant interaction effect existed for type of disorder and type of passenger (F (1, 142) = 2.23, *ns.*). The three-way interaction between type of disorder, type of passenger and type of lighting proved to be marginally significant with regard to social safety (F (1, 142) = 3.50, p = 0.06). Planned comparisons showed that participants in the light condition did not respond to differences in the type of disorder regardless of type of passenger, whereas in the dark condition the scores of must passengers on social safety are significantly different in the disorder condition and the order condition ($M_{disorder}$ = 3.39, SD = 0.17 versus M_{order} = 3.90, SD = 0.13; F (1, 142) = 5.40, p = 0.02). No differences were found for lust passengers between the disorder and order condition in the dark condition (F (1, 146) = 0.98, *ns.*). This interaction effect is plotted in figure 4.2.

a) Dark condition
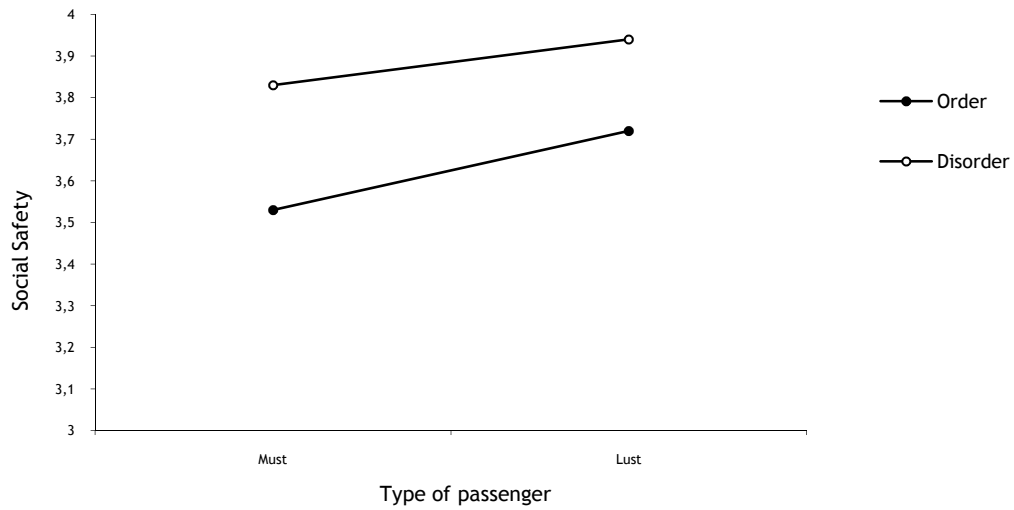

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b) Light condition

Figure 4.2: Interaction effect between type of passenger, lighting condition and disorder condition with regard to social safety.

Hypothesis 2c proposed that disorder at the railway station platform negatively influences the overall evaluation of the platform. No main effect was found for type of disorder on the overall evaluation of the platform (F (1, 142) = 0.59, *ns.*). Also, no interaction effects were found between type of disorder and type of passenger (F (1, 142) = 0.80, *ns.*), type of disorder and lighting condition (F (1, 142) = 0.25, *ns.*) or between type of disorder, type of passenger, and lighting condition (F (1, 142) = 0.42, *ns*) with regard to overall evaluation of the platform. Therefore, hypothesis 2c is rejected.

Hypothesis 3a stated that lighting at a railway station platform positively influences perceived control. No significant main effect was found for lighting condition on perceived control (F (1, 142) = 0.09, *ns.*). No significant interaction effects were found between lighting condition and type of passenger (F (1, 142) = 0.35, *ns.*), lighting condition and disorder condition (F (1, 142) = 0.13, *ns.*), and lighting condition, type of passenger and disorder condition (F (1, 142) = 0.44, *ns.*) with regard to perceived control. Hypothesis 3a is rejected.

Hypothesis 3b proposed that bright lighting at the platform will positively influence the evaluation of the platform for must passengers, while dimmed lighting at the platform will positively influence the evaluation of the platform for lust passengers. No interaction effect between type of passenger and lighting condition was found with regard to the evaluation of the platform (F (1, 142) = 0.62, *ns.*). Hypothesis 3b is rejected.

Hypothesis 3c proposed that disorder will influence the evaluation of the platform more negative for must passengers than for lust passengers. No interaction effect between type of passenger and disorder condition was found with regard to the evaluation of the railway station platform. Therefore, hypothesis 3c was rejected.

Hypothesis 4 proposed that familiarity with the railway station positively influences feelings of social safety on the platform. No significant main effect for familiarity with the railway station was found (F (1, 134) = 0.10, *ns.*). In addition, no significant interaction effects were found for between familiarity with the railway station and disorder condition (F (1, 134) = 1.14, *ns.*), familiarity with the railway station and type of lighting (F (1, 134) = 0.58, *ns.*), and familiarity with the railway station and type of passenger (F (1, 134) = 2.73, *ns.*) with regard to social safety. Also, the three-way interactions between familiarity with the railway station, disorder condition, and type of passenger (F (1, 134) = 2.10, *ns.*) and familiarity with the railway station, lighting condition, and type of passenger (F (1, 134) = 0.16, *ns.*) proved not to be significant with regard to social safety. The four-way interaction between familiarity at the railway station, type of passenger, lighting condition and disorder condition also was not significant (F (1, 134) = 0.04, *ns.*). Therefore hypothesis 4 is rejected.

Hypothesis 5b suggested that disorder at the railway station platform negatively influences passengers' perceived control. No significant main effect for disorder condition on perceived control was found (F (1, 142) = 1.34, *ns.*). In addition, no significant interaction effects were found between disorder condition and type of passenger (F (1, 142) = 0.74, *ns.*), disorder condition and lighting condition (F (1, 142) = 0.13, *ns.*), and disorder condition, lighting condition, and type of passenger (F (1, 142) = 0.44, *ns.*) with regard to perceived control. Therefore, hypothesis 5b is rejected.

4.3 Correlational data

The correlations between the scales included in this study can be found in table 4.2. This correlation matrix reveals that most of the scales are positively correlated, except for the perceived crowding scale, which correlates negatively with the other scales. Most of the correlations proved to be significant. Both perceived lighting and perceived disorder strongly correlated with the other variables in the study, except for the correlation between perceived lighting and perceived control.

Table 4.2: Correlations between the scales used in this study.

	Perc. Lighting	Perc. Disorder	Social Safety	Perc. Control	Overview	Perc. Crowding	Evaluation of the platform	Approach/ Avoidance Behaviour
Perceived Lighting	1							
Perceived Disorder	.24	1						
Social Safety	.19	.19	1					
Perceived Control	.04	.20	.48	1				
Overview	.31	.60	.39	.53	1			
Perceived Crowding	-.06	-.28	-.27	-.37	-.48	1		
Evaluation of the platform	.17	.84	.21	.27	.54	-.28	1	
Avoidance Approach Behaviour	.16	.37	.44	.42	.47	-.26	.49	1

N=150. Correlation coefficients r >.23 are significant at the 0.01 level (two-tailed); correlation coefficients r >.16 are significant at the 0.05 level (two-tailed)

4.4 Regression analyses

Next, stepwise multiple regression analyses were performed to investigate whether relationships between the ordinal variables can be found. Hypothesis 5a proposed that perceived control positively influences feelings of social safety. Stepwise multiple regression analysis showed that the regression model consisted of Perceived Control and Perceived Lighting. Therefore hypothesis 5a can be confirmed. In addition, perceived lighting also positively influences feelings of social safety. Hypothesis 6 suggested that perceived crowding negatively influences feelings of social safety. The model did not find a significant relation between feelings of social safety and perceived crowding. Thus, hypothesis 6 is rejected.

Table 4.3: Regression on Social Safety.

	Social Safety		
	B	T	p
Perceived Lighting	0.17	2.47	.02
Perceived Control	0.34	4.67	<.00
Perceived Crowding	-0.08	-1.06	*ns.*
Overview	0.13	1.48	*ns.*

Table 4.4: Regression on Overview.

| | Overview | | |
	B	T	p
Perceived Lighting	0.18	3.30	<.00
Perceived Disorder	0.43	7.58	<.00
Perceived Crowding	-0.22	-3.85	<.00

All significant findings of the regression analysis are presented in figure 4.3. Perceived lighting significantly influenced the scores on overview. Perceived disorder significantly influenced the scored on overview, perceived crowding, and the evaluation of the platform. Social safety and overview significantly influenced avoidance and approach behaviour.
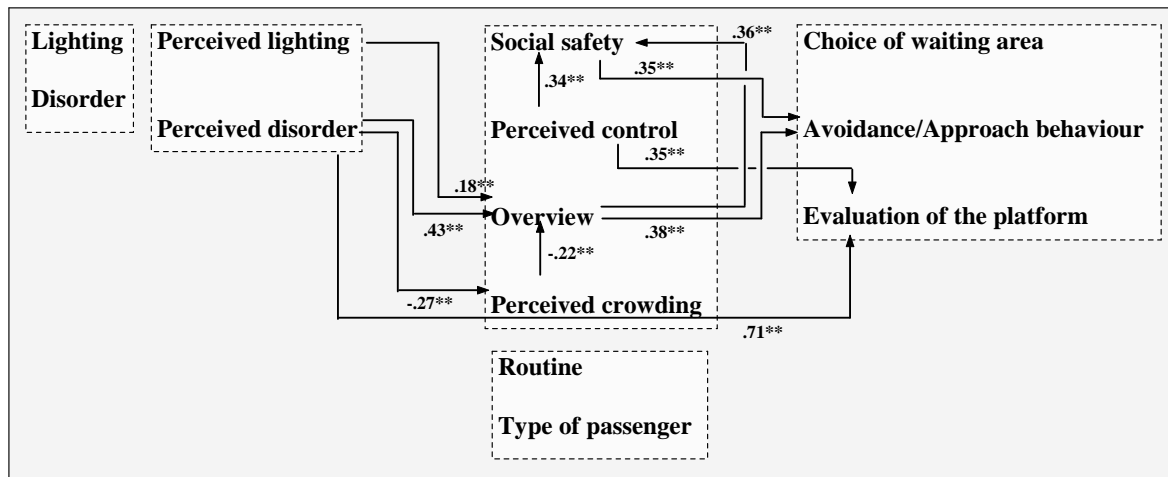

Figure 4.3: Significant findings of the regression analyses.

4.5   Mediator Analysis

To research hypothesis 1a which proposed that a positive effect of lighting at the railway station platform exists on feelings of social safety, which is mediated by overview, a mediator analysis was performed, following the procedure outlined by Baron and Kenny (1986). Firstly, a linear regression was performed with social safety as dependent variable. Results showed a significant relation between social safety and perceived lighting. Next, a linear regression was conducted with overview as dependent variable. Results showed a significant relation between perceived lighting and overview ($B = .16$, $t = 3.94$, $p < .00$). Finally, inserting overview as mediator into the regression analysis yielded a significant effect for overview on feelings of social safety ($B = .36$, $t = 4.35$, $p < .00$. and resulted in the decrease of the effect of perceived lighting on feelings of social safety ($B = .04$, $t = 0.95$, *ns.*). A subsequently performed Sobel test showed that the effect of perceived lighting on feelings of

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social safety via overview is significant (*Sobel z* = 2.98, *p* < .00). This indicates a full mediation by overview. The findings of this mediator analysis can be found in figure 4.4. Hypothesis 1a is confirmed.
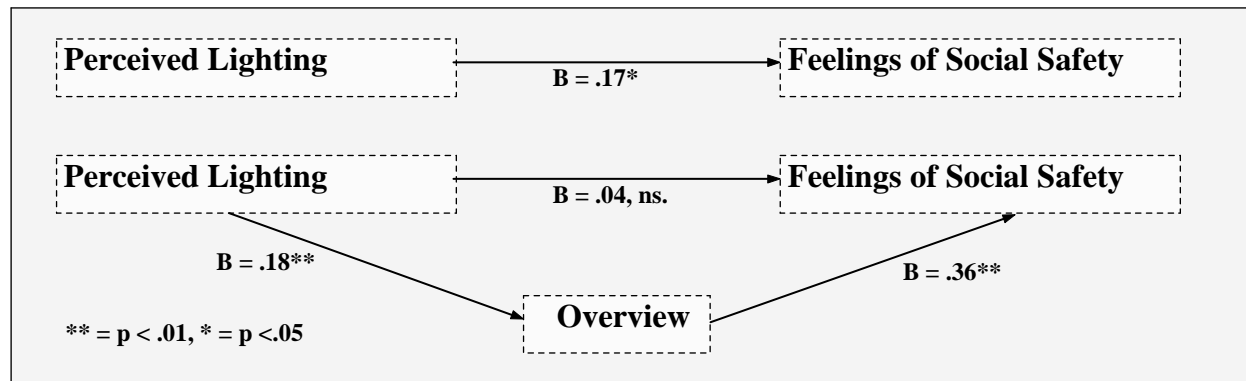

Figure 4.4: Results of mediator analysis.

5.   Discussion

5.1   Findings from the study

This study set out to research the relationship between lighting and disorder on feelings of social safety on a railway station platform. In table 5.1 the conclusions with regard to the hypotheses are presented. Now, the findings of this study and its implications for practice and future research are discussed.

Table 5.1: The findings of this study with regard to the hypotheses.

	Hypothesis	**Conclusion**
1a.	A positive effect of lighting at the railway station platform on feelings of social safety exists, which is mediated by overview.	Confirmed
1b.	A positive effect of lighting at the railway station platform exists on the overall evaluation of the platform.	Rejected
2a.	Lighting at a railway station platform will decrease the evaluation of litter at the railway station platform.	Rejected
2b.	Disorder at the railway station will decrease the passengers' feelings of social safety at the platform.	Confirmed only for must passengers in the dark condition
2c.	Disorder at the railway station platform will negatively influence the overall evaluation of the platform.	Rejected
3a.	Lighting a the railway station platform will positively influence the passengers' perceived control at the platform.	Rejected
3b.	Bright lighting at the platform will positively influence the evaluation of the platform for must passengers, while dimmed lighting at the platform will positively influence the evaluation of the platform for lust passengers.	Rejected
3c.	Disorder will influence the evaluation of the platform more negative for must passengers than for lust passengers.	Rejected
4.	Familiarity with the railway station platform will positively influence passengers' feelings of social safety at the platform.	Rejected
5a.	Perceived control at the railway station platform will positively influence feelings of social safety at the platform.	Confirmed
5b.	Disorder at the railway station platform will negatively influence passengers' perceived control at the platform.	Rejected
6.	Perceived crowding at the railway station platform negatively influences passengers' feelings of social safety at the platform.	Rejected

5.2   Limitations of this study

Before answering the research question some limitations of this study will be discussed. The participants in this study did not evaluate the dark and light condition as different regarding lighting. Participants also did not evaluate the order and disorder condition as different regarding perceived disorder. Literature however, shows that low empirical correlations between perceived cleanliness and actual cleanliness are common (Robin, 2007). But, more likely, this lack of significant differences in the evaluation of the littered and clean platform is caused due to the way the litter was implemented. The litter that was used was not implemented in the slides, but was set up in the testing room. Participants were asked to imagine they were standing on the platform instead of sitting in the testing room. However, results suggest participants did not include the litter in the testing room into their railway station platform evaluations. These findings indicate that the manipulations with regard to lighting and disorder were unsuccessful. This limits the validity of the results with regard to lighting and disorder.

Another limitation of this study is the use of a convenience sample. The convenience sample mainly consisted of people younger than 30 years. 88.7% of the participants were younger than 30, and only 5.4% of the participants were older than 50. Furthermore, most of the participants were students. This influences the generalization of the results because factors as age, ethnicity, education level and social economical status differ from the overall population.

5.3   Conclusions

This study tried to answer the research question:

 '*What is the influence of lighting and disorder at the railway station platform on passengers' feelings of safety, control, uncertainty, overview, and spaciousness, and how does it influence the evaluation of the platform?"*

Perceived lighting was found to influence social safety. When participants evaluated the platform as light, they felt more safe at the platform than when they evaluated the platform as dark. This relationship is mediated by overview. This is in accordance with findings in literature (e.g. Loewen et al., 1993; Van 't Hof, 2008). Lighting is related to overview and enhances visibility (Van 't Hof, 2008). This visibility enhances feelings of social safety.

Perceived disorder did not influence feelings of social safety. However, the interaction effect between lighting and disorder shows a surprising result. Passengers in the light condition felt more safe at the disorderly railway station platform than at the orderly railway station platform. This result seems contradictory to the literature concerning disorder and safety perception which states that people feel more safe in an orderly environment (Duineveld, 2010). However, this finding might be linked to the research of Molenaar (2010) which suggests that lighting in an environment diminishes the effects of disorder in the environment. People expect the well-lit litter to be cleaned quickly and evaluate the well-lit littered environment as kept in better condition. The assumption that the railway station platform is kept in good condition, might contribute to feelings of social safety. This effect could also explain the positive relation between perceived litter and the evaluation of the platform.

The influence of passenger type with regard to social safety was shown in this study. An interaction effect for type of passenger, disorder condition, and lighting was found. Must passengers in the combined dark and disorder condition report lower feelings of social safety than both lust passengers in the dark and disorder condition and must and lust passengers in the combined dark and order condition. This is related to the finding of Machleit, Eroglu and Powell Mantel (2000) that must passengers react more irritated and discontented to unexpected findings in the environment than lust passengers. The disorder at the platform might irritate must passengers. In addition, must passengers are found to appreciate bright lighting more than dimmed lighting. Dimmed lighting is seen as more relaxing and is preferred by lust passengers (Galetzka et al., 2010). Therefore the combined dark and littered does not meet the needs of must passengers and this seems to influence must passengers' feelings of social safety.

Both feelings of social safety and overview enhance approach behavior of the passengers. This finding is in agreement with the study of Blöblaum and Hunecke (2005) who found that feelings of social unsafety and impaired overview result in coping behavior, anxiety, and avoidance behavior. Perceived control enhances the evaluation of the platform. The influence of perceived control on the evaluation of the platform is in line with the findings in the literature. Ward and Barnes (2001) found that a lack of control leads to passive acceptance of the environment, which then leads to helplessness and avoidance behavior. This study adds to that knowledge that feeling in control leads to a positive evaluation of the platform.

Overall, the findings of this study are in agreement with findings in the literature. This study added to the existing knowledge with regard to the importance of the subjective evaluation of lighting and disorder. This study showed that not the factors of lighting and disorder, but the perception of lighting and disorder influence the feelings of the passenger. This indicates that the subjective experience of lighting and disorder might be more important than the actual levels of lighting and disorder. This is in accordance with the suggestions of Eysink Smeets (2007) that the perception of litter is a subjective evaluation. In addition, lighting also proves to be a subjective evaluation.

5.4   Recommendations

The knowledge with regard to the relationship between lighting, disorder, and social safety could be increased by conducting a study where disorder and lighting is applied in a real railway station platform setting.

Future research should investigate the relationship of subjective evaluation of lighting and actual lighting. This study showed the importance of the subjective evaluation of lighting, but due to lack of significant findings of the multivariate analysis of variance, no conclusive statements could be made with regard to this relationship. The same applies to the relationship between litter and the subjective evaluation of litter. Although the importance of the evaluation of litter is emphasized by Eysink Smeets (2007), literature shows that low empirical correlations between perceived cleanliness and actual cleanliness are common (Robin, 2007). This further underlines the importance of researching the mechanisms that influence the perception of litter.

ProRail could use the findings from this study for enhancing the social safety at the railway station platform and enhancing approach behavior at the platform. People will choose not to travel by public transportation if they do not feel safe in the public transportation environment (Van 't Hof, 2008). By establishing a clean railway station platform social safety could be enhanced. This is especially important during peak hours. Must passengers were found to be influenced most by disorder at a dark platform with regard to social safety. Must passengers travel mainly during peak hours (Galetzka et al, 2012). Therefore, by keeping the railway station platform clean, especially during peak hours, feelings of social safety at the railway station platform will be enhanced most. This in turn will enhance the approach behavior at railway station platform.

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V Appendices

Appendix A: Scenarios must passengers and lust passengers

Scenario 1: Mustreiziger

Beste Deelnemer,

Bedankt voor je deelname aan dit onderzoek. Dit onderzoek richt zich op de beleving van stations. Het onderzoek bestaat uit verschillende onderdelen. Eerst krijg je een scenario te lezen van een situatie, daarna zie je een aantal korte slides. Na deze slides is het de bedoeling een vragenlijst in te vullen. <u>Probeer bij het zien van de slides en het invullen van de vragenlijst je in te leven alsof je de persoon in het scenario bent.</u>

Hier volgt jouw scenario:

"Het is vrijdagmiddag 17.00 uur en je werkdag zit erop; tijd om naar huis te gaan. Je bent net als de rest van de dagen met de trein en stapt in op station Eindhoven. Je wilt uiterlijk om 19.00 uur thuis zijn, want vrienden komen je dan ophalen".

Je krijgt nu een aantal slides te zien van het station van Eindhoven. Vul na het bekijken van het filmpje de vragenlijst in vanuit bovenstaand perspectief.

Scenario 2: Lustreiziger.

Beste Deelnemer,

Bedankt voor je deelname aan dit onderzoek. Dit onderzoek richt zich op de beleving van stations. Het onderzoek bestaat uit verschillende onderdelen. Eerst krijg je een scenario te lezen van een situatie, daarna zie je een aantal korte slides. Na deze slides is het de bedoeling een vragenlijst in te vullen. <u>Probeer bij het zien van de slides en het invullen van de vragenlijst je in te leven alsof je de persoon in het scenario bent.</u>

Hier volgt jouw scenario:

"Het is vrijdagmiddag 17.00 uur. Je hebt vandaag een dagje vrij van je werk en hebt besloten je familie te gaan opzoeken in Utrecht met de trein. Je stapt in op station Eindhoven. Je familie verwacht je niet op een bepaald tijdstip, dus je hebt alle tijd om in Utrecht te komen".
Je krijgt nu een aantal slides te zien van het station van Eindhoven. Vul na het bekijken van het filmpje de vragenlijst in vanuit bovenstaand perspectief.

Appendix B: List of items per construct

Choice of waiting area on the platform	- measured by use of four stills from photo's of platform 1/2 of railway station Eindhoven
Social safety (Taylor, 1994)	- On this railway station platform I feel:calm, at ease, fearful, insecure, safe.
Perceived control bron	- On this railway station platform I feel I have control over the situation. - On this railway station platform I can easily find what I am looking for. - On this railway station platform I feel free in my comings and doings - On this railway station platform I can achieve my goals
Overview (Sauren, 2010)	- This railway station platform is well arranged - On this railway station platform I can find my way - I would get lost on the railway station platform
Overview (Van 't Hof, 2008)	- This railway station platform is chaotic - There are a lot of objects that limit my overview - This railway station platform has a lot of areas where criminals could hide - The lighting on this railway station platform is good. - This railway station platform has a lot of dark areas - I can see easily see where I can go if I were to be attacked
Perceived crowding (Machleit,Kellaris&Eroglu, 1994)	- This railway station platform seemed very crowded to me - This railway station platform was a little to busy - Er was niet veel drukte op dit perron gedurende de tijd dat ik hier aanwezig was - Er waren teveel mensen aanwezig op dit perron
Evalution of the platform (Van Hagen, 2011)	- The railway station platform has a warm gleam to it - The railway station platform is well cared for

	- The railway station platform is attractive - The railway station platform is pleasant - The railway station platform seems professional - The railway station platform is littered - The railway station platform is well maintained - The railway station platform is comfortable
Approach/avoidance (Peters, 2008)	- Ik zou op dit perron rustig een kopje koffie kunnen drinken - Ik zou op dit perron blijven wachten als de trein vertraging heeft - Ik zou gemakkelijk andere reizigers aanspreken op dit perron - Ik vermijd andere reizigers op dit perron - Ik zou het perron gaan verkennen - Ik zou op dit perron rustig een krant kunnen lezen - Ik vind dit perron prettig
Lighting (Peters, 2008)	- The lighting on this railway station platform was: quite dark-quite light - The colours on this railway station platform were: cool-warm - The colours on this railway station platform were: quite grey-quite colourful
Incidental/ frequent passenger; Must/lust passengers.	- How often do you travel by train? - What is the most common reason of your train journey? - Do you mostly travel during the peak hours, or outside the peak hours? - Are you familiar with railway station Eindhoven?
Socio-demographic variables	- Sex: male/female - Age.... - Education:

Appendix C: Questionnaire

Onderzoek Stationsbeleving

45

Beste respondent,

De Universiteit Twente doet op dit moment onderzoek naar stationsbeleving. Aangezien uw mening daarbij van groot belang is, willen wij u vragen deze vragenlijst in te vullen. Het duurt gemiddeld 5-10 minuten om de gehele vragenlijst in te vullen. Er wordt gevraagd naar uw mening, dus er bestaan geen goede of foute antwoorden. Uw antwoorden worden anoniem verwerkt.

Alvast hartelijk dank voor uw deelname!

U heeft zojuist een aantal slides gezien van het perron in Eindhoven waar uw trein vertrekt. Welke plaats op het perron zou u kiezen om te wachten?
Kies uit één van de volgende afbeeldingen (lichte conditie):

☐ afbeelding A

☐ afbeelding B

☐ afbeelding C

☐ afbeelding D

Vult u nu de rest van de vragenlijst in vanuit het perspectief dat u zojuist heeft gelezen door het hokje dat met uw antwoord correspondeert volledig in te kleuren. Bij het verkeerd inkleuren van het hokje, zet u een kruis door het foutieve antwoord en kleurt u het correcte antwoord in. Hieronder kunt u een voorbeeld zien hoe u de vragen moet invullen.

Voorbeeldvraag:

Ik houd van sporten:

☐	☐	☐	■	☐
helemaal meeoneens	*enigszins meeoneens*	*niet mee eens/ niet mee oneens*	*enigszins meeeens*	*helemaal meeeens*

U heeft zojuist een aantal slides gezien van het perron in Eindhoven waar uw trein vertrekt. Welke plaats op het perron zou u kiezen om te wachten?
Kies uit één van de volgende afbeeldingen (donkere conditie):

☐ afbeelding A

☐ afbeelding B

☐ afbeelding C

☐ afbeelding D

Vult u nu de rest van de vragenlijst in vanuit het perspectief dat u zojuist heeft gelezen door het hokje dat met uw antwoord correspondeert volledig in te kleuren. Bij het verkeerd inkleuren van het hokje, zet u een kruis door het foutieve antwoord en kleurt u het correcte antwoord in. Hieronder kunt u een voorbeeld zien hoe u de vragen moet invullen.

Voorbeeldvraag:

Ik houd van sporten:

☐	☐	☐	■	☐
helemaal meeoneens	enigszins meeoneens	niet mee eens/ niet mee oneens	enigszins meeeens	helemaal meeeens

---

1. Geef aan hoe u zich voelt op het perron:

Ik voel mij op dit perron:

Gelukkig	☐	☐	☐	☐	☐	Ongelukkig
Geïrriteerd	☐	☐	☐	☐	☐	Blij
Ontevreden	☐	☐	☐	☐	☐	Tevreden
Zwaarmoedig	☐	☐	☐	☐	☐	Voldaan
Onplezierig	☐	☐	☐	☐	☐	Plezierig
Wanhopig	☐	☐	☐	☐	☐	Hoopvol
Verdrietig	☐	☐	☐	☐	☐	Blij
Depressief	☐	☐	☐	☐	☐	Vrolijk
Passief	☐	☐	☐	☐	☐	Actief
Slaperig	☐	☐	☐	☐	☐	Wakker
Verveeld	☐	☐	☐	☐	☐	Belangstellend
Onverschillig	☐	☐	☐	☐	☐	Betrokken
Pessimistisch	☐	☐	☐	☐	☐	Optimistisch
Gespannen	☐	☐	☐	☐	☐	Kalm
Angstig	☐	☐	☐	☐	☐	Rustig
Nerveus	☐	☐	☐	☐	☐	Ontspannen
Volgzaam	☐	☐	☐	☐	☐	Leidend
Volgend	☐	☐	☐	☐	☐	Sturend
Onderdanig	☐	☐	☐	☐	☐	Dominant

2. Geef bij onderstaande stellingen aan in hoeverre u het er mee eens bent:

Zoals u wellicht heeft kunnen zien, zijn er verschillen tussen het begin en het einde van het perron.

Deze vraag (vraag 2) heeft hier betrekking op.

Ik voel mij aan het <u>begin</u> van dit perron:

Rustig:

helemaal mee oneens ▯ ▯ ▯ ▯ ▯ helemaal mee eens

Op mijn gemak:

helemaal mee oneens ▯ ▯ ▯ ▯ ▯ helemaal mee eens

Angstig:

helemaal mee oneens ▯ ▯ ▯ ▯ ▯ helemaal mee eens

Onzeker:

helemaal mee oneens ▯ ▯ ▯ ▯ ▯ helemaal mee eens

Veilig:

helemaal mee oneens ▯ ▯ ▯ ▯ ▯ helemaal mee eens

Ik voel mij aan het <u>einde</u> van dit perron:

Rustig:

helemaal mee oneens ▯ ▯ ▯ ▯ ▯ helemaal mee eens

Op mijn gemak:

helemaal mee oneens ▯ ▯ ▯ ▯ ▯ helemaal mee eens

Angstig:

helemaal mee oneens ▯ ▯ ▯ ▯ ▯ helemaal mee eens

Onzeker:

helemaal mee oneens ▯ ▯ ▯ ▯ ▯ helemaal mee eens

Veilig:

helemaal mee oneens ▯ ▯ ▯ ▯ ▯ helemaal mee eens

3. Geef ook bij onderstaande stellingen aan in hoeverre u het er mee eens bent:

Op dit perron heb ik het gevoel dat ik controle heb over de situatie:

helemaal mee oneens ▯ ▯ ▯ ▯ ▯ helemaal mee eens

Op dit perron kan ik eenvoudig vinden waar ik naar op zoek ben:

helemaal mee oneens ⬜ ⬜ ⬜ ⬜ ⬜ helemaal mee eens

Op dit perron voel ik mij vrij in mijn doen en laten:

helemaal mee oneens ⬜ ⬜ ⬜ ⬜ ⬜ helemaal mee eens

Op dit perron kan ik doen waar ik voor gekomen ben:

helemaal mee oneens ⬜ ⬜ ⬜ ⬜ ⬜ helemaal mee eens

4. Geef ook bij onderstaande stellingen aan in hoeverre u het er mee eens bent:

Ik vind het perron overzichtelijk:

helemaal mee oneens ⬜ ⬜ ⬜ ⬜ ⬜ helemaal mee eens

Op het perron kan ik mijn weg goed vinden:

helemaal mee oneens ⬜ ⬜ ⬜ ⬜ ⬜ helemaal mee eens

Ik zou hier de weg kwijtraken:

helemaal mee oneens ⬜ ⬜ ⬜ ⬜ ⬜ helemaal mee eens

Dit perron is chaotisch:

helemaal mee oneens ⬜ ⬜ ⬜ ⬜ ⬜ helemaal mee eens

Er staan of hangen op dit perron veel objecten die mijn overzicht beperken:

helemaal mee oneens ⬜ ⬜ ⬜ ⬜ ⬜ helemaal mee eens

Dit perron heeft veel plekken waar criminelen zich zouden kunnen verschuilen:

helemaal mee oneens ⬜ ⬜ ⬜ ⬜ ⬜ helemaal mee eens

De verlichting op dit perron is goed:

helemaal mee oneens ⬜ ⬜ ⬜ ⬜ ⬜ helemaal mee eens

Dit perron heeft veel donkere plekken:

helemaal mee oneens ⬜ ⬜ ⬜ ⬜ ⬜ helemaal mee eens

Ik zie op dit perron snel waar ik heen kan als ik andere mensen wil vermijden:

helemaal mee oneens ⬜ ⬜ ⬜ ⬜ ⬜ helemaal mee eens

5. Geef ook bij onderstaande stellingen aan in hoeverre u het er mee eens bent:

Ik vind dat het op dit perron erg druk oogt:

helemaal mee oneens ⬜ ⬜ ⬜ ⬜ ⬜ helemaal mee eens

Ik vind het te druk op dit perron:

helemaal mee oneens ☐   ☐   ☐   ☐   ☐   helemaal mee eens

Er was niet veel drukte op dit perron gedurende de tijd dat ik hier aanwezig was:

helemaal mee oneens ☐   ☐   ☐   ☐   ☐   helemaal mee eens

Er waren teveel mensen aanwezig op dit perron:

helemaal mee oneens ☐   ☐   ☐   ☐   ☐   helemaal mee eens

6. Geef bij onderstaande stellingen aan hoe uw indruk van het perron is:

Het perron heeft een warme uitstraling:

helemaal mee oneens ☐   ☐   ☐   ☐   ☐   helemaal mee eens

Het perron ziet er verzorgd uit:

helemaal mee oneens ☐   ☐   ☐   ☐   ☐   helemaal mee eens

Het perron is aantrekkelijk:

helemaal mee oneens ☐   ☐   ☐   ☐   ☐   helemaal mee eens

Het perron is sfeervol:

helemaal mee oneens ☐   ☐   ☐   ☐   ☐   helemaal mee eens

Het perron oogt professioneel:

helemaal mee oneens ☐   ☐   ☐   ☐   ☐   helemaal mee eens

Het perron is rommelig:

helemaal mee oneens ☐   ☐   ☐   ☐   ☐   helemaal mee eens

Het perron is goed onderhouden:

helemaal mee oneens ☐   ☐   ☐   ☐   ☐   helemaal mee eens

Het perron is comfortabel:

helemaal mee oneens ☐   ☐   ☐   ☐   ☐   helemaal mee eens

7. Geef bij onderstaande stellingen aan in hoeverre u het er mee eens bent:

Ik zou op dit perron rustig een kopje koffie kunnen drinken:

helemaal mee oneens ☐   ☐   ☐   ☐   ☐   helemaal mee eens

Ik zou op dit perron blijven wachten als de trein vertraging heeft:

helemaal mee oneens ⬚　　⬚　　⬚　　⬚　　⬚　　helemaal mee eens

Ik zou gemakkelijk een andere reiziger aanspreken op het perron:

helemaal mee oneens ⬚　　⬚　　⬚　　⬚　　⬚　　helemaal mee eens

Ik vermijd andere reizigers op het perron:

helemaal mee oneens ⬚　　⬚　　⬚　　⬚　　⬚　　 helemaal mee eens

Ik zou het perron gaan verkennen:

helemaal mee oneens ⬚　　⬚　　⬚　　⬚　　⬚　　helemaal mee eens

Ik zou op dit perron rustig een krant kunnen lezen:

helemaal mee oneens ⬚　　⬚　　⬚　　⬚　　⬚　　helemaal mee eens

Ik vind dit perron prettig:

helemaal mee oneens ⬚　　⬚　　⬚　　⬚　　⬚　　helemaal mee eens

8a. Geef ook bij onderstaande stellingen aan in hoeverre u het er mee eens bent:

Het licht aan het <u>begin </u>van het perron was:

erg donker ⬚　　⬚　　⬚　　⬚　　⬚　　erg licht

De kleuren aan het <u>begin </u>van het perron waren:

koel ⬚　　⬚　　⬚　　⬚　　⬚　　warm

De kleuren aan het <u>begin </u>van het perron waren:

erg grauw ⬚　　⬚　　⬚　　⬚　　⬚　　erg kleurrijk

Het licht aan het <u>einde </u> van het perron was:

erg donker ⬚　　⬚　　⬚　　⬚　　⬚　　erg licht

De kleuren aan het <u>einde </u>van het perron waren:

koel ⬚　　⬚　　⬚　　⬚　　⬚　　warm

De kleuren aan het <u>einde </u>van het perron waren:

erg grauw ⬚　　⬚　　⬚　　⬚　　⬚　　erg kleurrijk

Hieronder vindt u een aantal algemene vragen die u naar uw eigen mening kunt invullen.

9. Hoe vaak reist u met de trein?

☐ 4 dagen per week of vaker

☐ 1-3 dagen per week

☐ 1-3 dagen per maand

☐ 6-11 dagen per jaar

☐ 1-5 dagen per jaar

10. Wat is meestal de reden van uw treinreis?

☐ Van en naar het werk

☐ Zaken- of dienstreis, bezoek congres

☐ Van en naar school, studie, opleiding, stage

☐ Bezoek aan familie, vrienden, kennissen

☐ Winkelen

☐ Vakantie of uitstapje

☐ Sport of hobby

☐ Anders, namelijk _____

11. Indien u met de trein reist, reist u meestal in of buiten de spitsuren?

☐ Zowel 's ochtends als 's middags tijdens de spits

☐ Meestal 's ochtends in de spits, 's middags niet

☐ Meestal 's middags in de spits, 's ochtends niet

☐ Meestal alleen buiten de spitsuren

☐ Ongeveer even vaak in als buiten de spits

12. Bent u bekend met station Eindhoven?

☐ Ja

☐ Nee

13. Wat is uw geslacht?

☐ man

☐ vrouw

14. Wat is uw leeftijd:

_____ jaar

15. Wat is uw hoogst afgeronde opleiding:

- ☐ Basisonderwijs
- ☐ LBO/VBO/VMBO/ULO
- ☐ MAVO/MULO
- ☐ MBO
- ☐ HAVO, VWO, HBS
- ☐ HBO
- ☐ WO
- ☐ Anders, namelijk;...

Respondent nr:

Dit is het einde van de vragenlijst. Hartelijk dank voor uw medewerking.

Appendix D: Slides from the video used in the experiment

Slides: dark condition

Slide 1

Slide 2

Slide 3

Slide 4

Slide 5

Slide 6

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Slide 11

Slide 12

Slide 13

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Slide 39

Slide 40

Slide 41

Slide 42

Slide 43

Slides: light condition

Slide 1

Slide 2

Slide 3

Slide 4

Slide 5

Slide 6

Slide 7

Slide 8

Slide 9

Slide 10

Slide 11

Slide 12

Slide 13

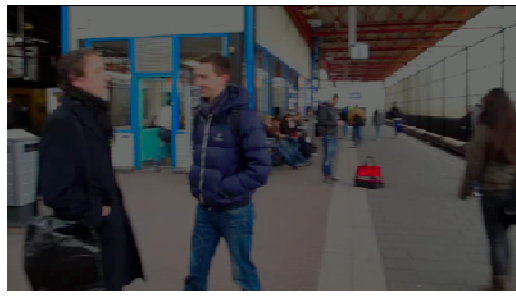
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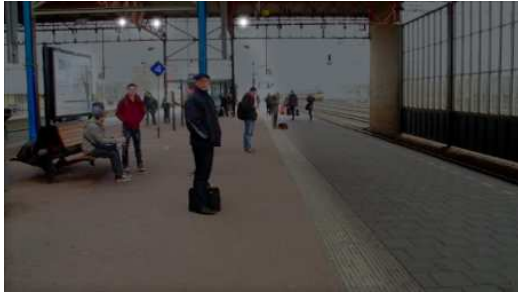
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Slide 43

Appendix E: Descriptive statistics

Table 1: Descriptive statistics of the participants.

	Male		Female		Total	
	M	*SD*	*M*	*SD*	*M*	*SD*
Age	26.50	11.12	24.50	8.50	25.50	9.83
Education	**%**		**%**		**%**	
lbo/vbo/vmbo/ulo	1.4		1.3		1.3	
mavo/mulo	0.0		1.3		0.7	
mbo	1.4		2.5		2.0	
havo/vwo/hbs	47.1		43.8		45.3	
hbo	25.7		25.0		25.3	
wo	22.9		26.3		24.7	
Train travelexperience	**%**		**%**		**%**	
4 days a week or more	11.4		8.8		10.0	
1-3 days a week	31.4		38.8		35.3	
1-3 days a month	18.6		23.8		21.3	
6-11 days a year	14.3		13.8		14.0	
1-5 days a year	24.3		15.0		19.3	
Traveller type	**%**		**%**		**%**	
frequent	61.4		71.3		66.6	
infrequent	38.6		28.7		33.4	
Familiarity with Eindhoven Station	**%**		**%**		**%**	
	22.9		18.8		20.7	
Overall reason to travel	**%**		**%**		**%**	
must	44.3		38.8		41.3	
lust	55.7		61.2		58.7	
Moment of trainjourney	**%**		**%**		**%**	
During morning- and evening peakhours	17.1		13.8		15.3	
During morning peakhours	1.4		7.5		4.7	
During evening peakhours	7.1		2.5		4.7	
Outside peakhours	50.0		33.8		41.3	
Both during and outside peakhours	24.30		42.5		34.0	

Table 2: Reliability and scores per construct.

Construct	Cronbachs alpha	Minimum score	Maximum score	Mean	Standard Deviation
Social Safety at beginning platform	0.79	1.8	5	3.57	0.73
Social Safety at end of the platform	0.82	1.6 1	5	3.83	0.69

Perceived control	0.66	1.75	5	3.69	0.68
Overview	0.80	1.89	4.89	3.47	0.68
Perceived crowding	0.82	1	5	3.14	0.92
Attitude	0.85	1.38	4.88	2.97	0.68
Approach avoidance	0.72	1.67	4.83	3.28	0.68
Lighting at beginning platform	-	1	5	2.77	0.81
Colour at beginning platform	0.76	1	4	2.63	0.75
Lighting at end platform	-	1	5	3.51	0.90
Colour at end platform	0.83	1	5	2.82	0.76
Disorder	0.72	1	5	3.41	0.79

Minimum score possible:1, maximum score possible:5.

Table 3: Distribution of the participants over the different conditions.

	Light environment		Dark environment	
	Order	Disorder	Order	Disorder
Must passenger	*n=26*	*n=14*	*n=21*	*n=12*
Lust passenger	*n=27*	*n=10*	*n=30*	*n=10*