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Combining source trustworthiness with message credibility. Are you being persuaded?

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6/19/2013

Abstract

The purpose of this thesis is to determine what the effects are of advertisements that combine an expert source with messages that differ in argument quality. The majority of prior research focusses on addressing different sources but rarely on comparable sources. The two messages contained either strong or weak arguments and strove to persuade readers to purchase a PV-installation.

Use has been made of a 2X2 experimental research design. The two expert sources were an engineer and a salesperson. The two sources were combined with a text containing either strong or weak arguments. Prior to gathering the final data a pretest was conducted in order to determine what arguments were perceived as strong or weak and whether or not the two expert sources were indeed seen as an engineer or a salesperson. Furthermore a model was developed and tested.

Four different advertisement combinations were developed. After being exposed to the advertisement participants were asked to fill out a questionnaire that measured six constructs by means of existing scales. A net response of n=151 was managed which was equally distributed for all four advertisements combinations.

A Factor analysis determined that the items properly measured the six constructs. A two-way ANOVA analysis measured no main effects but showed that there was an interaction effect for a combination of engineer and strong arguments on the integrity of the engineer and the credibility of the message.

The model was tested too and a correlation coefficients test showed that there is a positive relation between source trustworthiness and message credibility. A linear regression analysis showed that the three constructs that account for trustworthiness have a positive influence on the participants' attitude towards the product. Also a linear regression analysis shows that credibility has a positive influence on the participants' attitude towards the product and that a positive attitude will lead to a higher purchase intention.

When an engineer uses strong arguments he is perceived to have more integrity than when he uses weak arguments. This applies to message credibility too. Whether or not a salesperson uses strong or weak arguments had no influence on the ability, benevolence or integrity of that salesperson. A similar outcome applies to message credibility. Also there was no significant interaction effect for source type and argument quality on the attitude and the purchase intention of the respondents.

As for the model testing, when a source is perceived as trustworthy the message will automatically be perceived as more credible. Both the source trustworthiness as well as the message credibility significantly influenced the attitude towards the product. When a message is perceived as credible the attitude towards the product will be positively influenced. Also a positive attitude will account for an increased purchase intention.

The research shows that combining an engineer with a message containing strong arguments will be perceived as the most persuasive advertisement combination when selling a technical product, in this case a PV-installation. Also the integrity is more important than the ability and the benevolence of the engineer. Respondents feel that the engineer should provide honest and sincere advice that is based on logic and factual data.

Keywords: expert sources**,** source trustworthiness, message credibility, argument quality

Table of Contents

1.0 Introduction

In the last decade renewable energy resources such as solar and wind energy have become a lot more affordable and popular among the general public (CBS, 2011). According to the Dutch Centrale Bureau voor de Statistiek (2011), renewable energy experienced a growth of approximately 1% annually between 2005 and 2011. As these products are now commercially interesting for consumers, numerous organizations, utility companies, as well as the government, are developing commercials and other marketing activities to persuade people to purchase such products. Because of this increase in popularity, it becomes very important to understand how such renewable energy developments can be best marketed.

When it comes to promoting products through written advertisements, prior marketing research has often focused on combining a source with a persuasive message (Andreoli & Worchel, 1978; Petty & Wegener, 1999; Sternthal, Phillips, & Dholakai, 1978). Often two sources were compared, for instance, an expert and a celebrity endorser or an expert and an end-user both promoting a specific product (Kelman, 1961; Sternthal, Phillips, & Dholakai, 1978). The utilized messages contain arguments and the quality of such arguments was determined by argument strength (Petty & Cacioppo, 1981; Verhoeven & Schellens, 2008). The messages often possessed strong argumentation developed by means of an intuitive feeling (Areni & Lutz, 1988; Petty & Cacioppo, 1981). These research papers subsequently studied the interaction effect between the source and the messages.

Thus far few studies have been done in which several expert sources are compared and there is still much debate on what a quality argument really is. Furthermore, it is still undetermined what the interaction effect of expert sources combined with messages possessing different argument strength will be, especially in relation to renewable energy products. These literature gaps will be addressed in this research.

Addressing these literature gaps will both have a practical as well as a theoretical advantage. It will provide more clarity regarding which source and message combinations are perceived as most persuasive and it will elaborate on how to define strong and weak arguments. Also, the study will clarify how to promote products in the rather young consumer market for renewable energy product.

2.0 Theoretical framework

2.1 Source Trustworthiness

In their Elaboration Likelihood Model (ELM), Petty and Cacioppo (1981) devised a dual processing theory of how attitudes are changed or formed when being presented with persuasive messages. The classic model proposes that persuasive messages are processed either through a central route or a peripheral route. High involvement consumers are generally persuaded via the central route, as they are more critical thus persuasive messages require strong and logical arguments. In the case of low product involvement consumers are more likely to be persuaded by peripheral cues such as product colors and the attractiveness of the source. The ELM theory has long been the leading theory for marketing and advertisement design.

Wilson and Sherrell (1993) found out that adding a peripheral cue, in their case physically depicting a message source, will positively influence purchase intention for both high and low involvement consumers. Gotlieb and Sarel (1991) show that when high product involvement is required the addition of a high credibility source will have a positive effect on purchase intention. Later on Petty and Wegener (1999) revised their ELM theory proving that certain peripheral cues can also influence high involvement consumers in a positive manner.

The outcome of such research often indicates that the higher the antecedents of source credibility (attractiveness, expertise or trustworthiness) the better the message persuasiveness (Andreoli & Worchel, 1978; Postmes, Spears, & Lea, 1998; Sternthal et al., 1978; Wilson & Sherrell, 1993). Research shows that the audience of a persuasive message, regardless of their product involvement, are more likely to accept message arguments when the senders are perceived as credible, experts and trustworthy sources (Andreoli & Worchel, 1978; Petty, Cacioppo, & Schumann, 1983; Sternthal et al., 1978).

However Mayer, Davis, and Schoorman (2007) state that expertise is an antecedent of trustworthiness. Instead of looking at single constructs such as expertise Mayer et al. (2007) developed a framework in which three antecedents for source trustworthiness were identified. The authors state that individuals evaluate the trustworthiness of a trustee by means of his or her ability, benevolence and integrity.

Ability is a group of skills, competencies, and characteristics that enable a party to have

influence within some specific domain. Benevolence is the extent to which a trustee is believed to want to do good to the trustor, disregarding selfish motives and focusing more on altruistic motives. Integrity refers to the trustor's perception that the trustee adheres to a set of principles that the trustor finds acceptable (Mayer et al., 2007).

In traditional marketing research message sources have been presented either as opposites who are, for example, attractive versus unattractive, credible versus not-credible, or as correspondents with different demographic background such as an expert versus a celebrity endorser or an expert versus an end-user (Gotlieb & Sarel, 1991; Kelman, 1961; Sternthal et al., 1978).

Studies which focused on comparing two expert sources are relatively few (Gotlieb & Sarel, 1991). Various scholars state that an expert can be seen as a reliable source with extensive knowledge and ability based on research, experience, or occupation in a particular area or field of work (Ericsson, Charness, Hoffman, & Robert, 2006). The sources of choice for this research are both an engineer and a salesperson as previous research indicated that these are both considered to be an expert source (Ericsson et al., 2006; Gotlieb & Sarel, 1991). Gotlieb and Sarel (1991) determined in their study that an engineer is perceived as more knowledgeable due to his/her level of scientific training and education as opposed to a salesperson who, compared to an engineer, might be perceived as someone that lacks education and scientific training. The engineer's higher level of education as well as scientific training implies that the engineer as a source will be perceived as more capable and more trustworthy than the salesperson. Also, since an engineer is perceived as more trustworthy it is also expected that the engineer will be perceived as having higher integrity and benevolence than a salesperson as these are determinants of trustworthiness (Mayer et al., 2007).

Furthermore these two expert sources are highly context relevant as both sources are frequently used when selling unattractive, complex products and/or new technological developments (Gotlieb & Sarel, 1991; Shanteau, Weiss, Thomas, & Pounds, 2003). Therefore the first hypothesis is proposed:

H1: An engineer will be perceived as more trustworthy than a salesperson when selling renewable energy.

2.2 Message credibility and argument quality

Apart from source trustworthiness, message credibility plays a critical role in the persuasion process as it greatly influences the level of persuasion for both central en peripheral route advertisements (Petty et al., 1983; Postmes, Spears, & Lea, 1998).

The credibility of a message can be defined as the extent to which a message is perceived as believable, reliable and trustworthy and is primarily determined by the quality of the arguments used in the message (Areni & Lutz, 1988; Flanagin & Metzger, 2000; Petty et al., 1983; Postmes et al., 1998). The source that conveys the message can also substantially influence the message credibility although this is secondary to the argument quality (Harkins & Petty, 1987).

2.2.1 Argument quality

Petty et al. (1983) operationalize argument quality with argument strength. The strength of an argument itself can either be strong or weak. Strong arguments are characterized by valid reasoning, logic and factual data, while weak arguments are characterized by the absence of factual data and the use of circular reasoning (Hustinx, Enschot, & Hoeken, 2006; Johnson, Maio, & Smith-McLallen, 2005; Park, Levine, Westerman, Orfgen, & Foregger, 2007; Petty et al., 1983). Petty, Cacioppo, and Heesacker (1981) describe strong arguments as ''logically sound, defensible and compelling'', whereas they describe weak arguments as being ''open to skepticism and easily refutable'' (p. 435). In other words, with strong arguments, the argument quality is high and with weak arguments the argument quality is low.

To illustrate the distinction between strong and weak arguments Petty et al. (1983) provided a good example of what the differences are between these weak and strong arguments which they tested as a (Petty et al., 1983)commercial for a new type of razor. The two advertisement texts are presented as example 1.0 and 1.1.

Example 1.0: *Positive attribute-**strong** argument* *''This coating forms a chemical seal which actually bonds with the metal and protects it from elements which can ruin a blade's sharpness and finish. This coating is so effective that the Edge blade gave fewer nicks and cuts than all four of the leading competitors.''* (Petty et al., 1983) (p. 140)

Example 1.1: *Positive attribute-**weak** argument*: *''This coating protects the blade from harmful elements – the elements which can ruin a good blade. This coating is so effective that the Edge blade gave fewer nicks and cuts than two of the four leading competitors.''* (Petty et al., 1983) (p. 140)

It is clear that the strong argument text presents more in-depth factual data regarding the new type of razor while the weak argument text is characterized by the absence of factual data and overall fuzzy description of the benefits. In other words, with the strong arguments text the argument quality is high and with weak arguments text the argument quality is low. As such, the following hypothesis is proposed:

H2: Argument quality (strong or weak) will influence message credibility in the way that strong arguments will make for a more credible message as opposed to weak arguments.

Although secondary to the quality of the arguments, disclosing the message source can positively influence the credibility of the message; especially when that source is perceived as trustworthy and an expert (Eastin, 2006; Harkins & Petty, 1987). If the source is well respected by the audience, thus perceived as honest and objective, it is more likely that the audience will accept and believe the message (Eastin, 2006; Newhagen & Nass, 1988). Therefore, the following hypothesis is proposed:

H3: There is a positive relation between source trustworthiness and message credibility in the way that when a source is seen as trustworthy, the message will be perceived as more credible.

Furthermore it is expected that the combination of an engineer with strong arguments will lead to the highest scores for ability, benevolence and integrity as well as to the highest score for message credibility. Also it is expected that an engineer with strong arguments will lead to the highest scores for attitude as well as intention. As there is insufficient literature available to hypothesize these expected interaction effects three exploratory questions are proposed:

Is there an interaction effect between source trustworthiness and message credibility in the way that the combination of source type with argument strength influences the benevolence, integrity and ability of the source?

Is there an interaction effect between source trustworthiness and message credibility in the way that the combination of source type with argument strength influences the credibility of the message?

Is there an interaction effect between source trustworthiness and message credibility in the way that the combination influences both the attitude towards the product and the purchase intention?

2.2.2 Attitude and intention

Both source trustworthiness and message credibility will have their effects on the attitude towards the product and subsequently the purchase intention (Petty & Wegener, 1999). Attitude is defined as an enduring, general, evaluation of an object, product or brand that energizes and directs an individual's behavior (Eagly & Chaiken, 1993; Solomon, 2009). Whereas purchase intention can be seen as the personal actions related to an object, product or brand determined by the attitude an individual holds towards an object, product or brand (Mitchell & Olson, 1981; Spears & Surendra, 2004).

Modern marketing literature state that both attitude towards the product as well as the intention to purchase are important variables that are influenced by persuasive messages (Perner, 2010; Solomon, 2009). Research shows that texts with strong arguments will be perceived as more persuasive and that the depiction of a credible source will yield greater attitude change (Verhoeven & Schellens, 2008; Wilson & Sherrell, 1993). Therefore the following hypotheses are proposed:

H4a: High source integrity will influence attitude towards the product.

H4b: High source benevolence will influence attitude towards the product.

H4c: High source ability will influence attitude towards the product.

H5: High message credibility will influence attitude towards the product.

Ajzen's (1991) theory of planned behavior (TPB) perfectly explains why persuasive messages influence the attitude towards a product. The theory of planned behavior predicts the behavioral intent of an individual. A central component of the theory is the individual's intention to behave in a certain way and the stronger the intention, the more likely the individual will portrait that behavior. Ajzen (1991) determined three constructs that influence intention being; attitude, subjective norm and perceived behavioral control. According to the TPB attitude is determined by the sum of beliefs about a particular

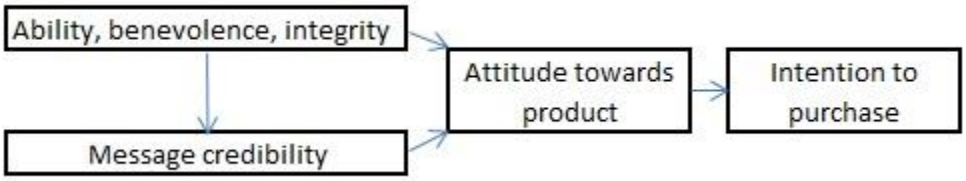
behavior. Although an integral part of the TPB's subjective norms and perceived behavioral control are irrelevant.

However, for this study the relation between attitude and intention is highly relevant as it is expected that the persuasiveness of an advertisement will positively influence the attitude, subsequently influencing purchase intention (Ajzen, 1991; Wilson & Sherrell, 1993). Therefore the following hypotheses are proposed:

H6: Positive attitude will account for an increase in purchase intention

Lastly, based on the theory discussed above a model is developed depicting how Hypotheses H3, $H4_{a, b, c,}$ H5 and H6 are related.

Figure 1: *Hypotheses Model*



3.0 Method section

In this section the process of collecting the research data will be discussed. Firstly the operationalization of the message source and the argument quality will be explained followed by the research design and the pre-test. Subsequently the research instrument and the respondents will be described. Lastly a brief introductory explanation of the data analysis will be presented.

As explained in the theoretical framework source trustworthiness and message credibility are considered to be the two main independent variables for this research. Thus far limited literature is available in which two expert sources are compared (Gotlieb & Sarel, 1991). Various scholars state that an expert can be seen as a reliable source with extensive knowledge and ability based on research, experience, or occupation in a particular area of field of work (Ericsson et al., 2006). The sources of choice are both an engineer and a salesperson as previous research indicated that these are both considered to be an expert source. (Ericsson et al., 2006; Gotlieb & Sarel, 1991; Mayer et al., 2007).

Message credibility will be determined by argument quality. The quality of the arguments is operationalized by messages that have either strong or weak arguments. The content of the two messages will regard a persuasive text that gives an enumeration of the benefits of commercial solar energy installations (PV-installations). PV-installations are currently increasing in popularity among the general public and is the most purchased system for energy generation (CBS, 2012).

3.1 Research Design and Procedure

Since the goal of the research is to investigate the relation between source trustworthiness and message credibility, a 2x2 experimental design was used for this study. An adult man will both play the role of engineer and salesperson and the two messages used will either contain strong or weak arguments. A male source was chosen because both Eagly (1983) as well as Nass and Moon (2000) determined that men are generally more influential than women as their evaluations and advice tends to be perceived as more valid. Also, because a technical product is sold people stereotypically expect a male sales representative (Sirgy, 1982).

Prior to gathering the final data a pretest was conducted in order to determine what arguments

are perceived as strong or weak and whether or not the two expert sources were indeed seen as an engineer or a salesperson.

The two different variables were displayed in four advertisements in which a photo of the source is positioned left from the text. The message content strives to persuade readers to purchase a PV-installation by giving two arguments that explain financial benefits and two arguments that explain environmental benefits. Although all arguments focus on the benefits of a PV-installation there is a clear distinction between strong and weak arguments in the way that strong arguments are characterized by valid reasoning, logic and factual data whereas the weak arguments are characterized by assumptions and absence of factual data. The advertisement texts can be found in appendix A.

After being exposed to the advertisement participants were asked to fill out a questionnaire. Six constructs were measured by four items for each construct. A limited amount of demographic questions were asked keeping the questionnaire compact since long questionnaires may lead to careless responses or quitting respondents (Breaugh & Colihan, 1994).

In order to measure the six constructs existing scales were used and when needed altered to fit the research. The scales for the constructs integrity benevolence and ability were developed by Mayer et al. (2007) and McKnight, Choudhury, and Kacmar (2002). The measurement scale for credibility came from Flanagin and Metzger (2000) study and the scales for attitude and intention were developed by Lin (2006), Dodds, Monroe, and Grewal (1991) and Kim, Ferrin, and Rao (2008) respectively.

3.2 Pretest

There is still much debate about what differentiates strong arguments from weak arguments. In order to design such messages two pre-tests were conducted. In the first pre-test 15 strong and 15 weak arguments were developed and tested to see if participant actually considered the arguments presented as strong or weak. For the second pre-test a message with strong arguments and a message with weak arguments were developed and double checked for reliability.

3.2.1 Pre-test 1

Firstly 15 strong and 15 weak arguments were gathered from various PV-installation reseller websites. Secondly the strong arguments were double checked for valid reasoning, logic and factual data and the weak arguments for absence of factual data, assumptions and in some cases usage of circular reasoning. 15 University Twente students received the pre-test questionnaire and for each argument they could indicate on a five-point Likert scale whether or not they felt the argument was strong or weak. The gathered data was analysed with SPSS after which four strong and four weak arguments were selected.

Table one shows the strong and weak arguments that were used in the second pre-test. For both the strong and weak arguments goes that two financial and two environmental benefits were selected with the highest mean and lowest SD for strong arguments and lowest mean and lowest SD for weak arguments.

Table 1: *Strong and Weak Arguments determined by the First Pre-test*

Strong Arguments	**Mean**	**SD**
The ROI time is much shorter than the average lifespan of the products. (financial)	4.00	.85
You will generate your own energy and become less dependent on energy suppliers. The average kWh price is 23 cents but the CBS expects an annual increase in price of around 7%. When you generate your own electricity these price increases will not affect you. (financial)	4.00	1.07
Solar energy is clean because no harmful gasses such as CO2 gas are emitted, which does happen when electricity is generate by means of coal power plants. (environment)	3.53	1.13
Solar energy is environmentally friendly. It is a natural inexhaustible source: no production of CO2. (environment)	3.40	1.12
Weak Arguments	**Mean**	**SD**
Solar energy is obviously good for the environment. (environment)	2.07	1.22
A PV-installation requires little maintenance due to the absence of moving parts which are prone to wear and tear. You will experience very little maintenance cost with a PV-installation. (financial)	2.53	.99
Solar energy does not use fossil energy which is why planet earth will be spared. (environment)	2.60	1.35
Sunlight and the heath coming from the sun are free. Apart from purchasing a PV-installation you are not required to make any extra costs at all for the utilization of the installation. (financial)	2.73	1.67

The message source was pre-tested too among the 15 respondents. They were presented with a photo of a man wearing a lab coat and safety goggles and a photo of the same man wearing a suit and tie. 100% of the 15 respondents were able to identify the individual as either being a salesperson or an engineer determined by the individual's attire. The photos of the source can be found in appendix A.

3.2.2 Pre-test 2

For the second pre-test the two final messages, drawn up with the arguments presented in table four, for the main research were double checked. Ten University Twente students were asked to assess either the strong or weak message by answering two five-point Likert scale questions (q1***: "****I find this text persuasive''* & q2: *''I find that the used arguments are strong''*) measuring persuasiveness and argument strength. An open question was added asking why the respondent felt the text was or was not persuasive. Example 2.0 and 2.1 give a sample of answers given to the open question and table two shows the results of the two five-point Likert scale questions.

Example 2.0: *Answers to Open Question for **Strong** Arguments*

Q: Explain whether or not you feel the text is persuasive

> *A1: Logical, strong arguments about economic and environmental benefits.*
> *A2: Strong arguments, it seems that factual data is used to back up the claims.*
> *A3: It's persuasive due to the good argumentation why a PV-installation ownership is an attractive proposition*

Example 2.1: *Answers to Open Question for **Weak** Arguments*

Q: Explain whether or not you feel the text is persuasive

> *A1: The arguments aren't so much arguments but more empty claims. Furthermore, there are no sufficient explanations to back up the claims. The reader can't decide for him or herself whether or not the PV-installation is attractive.*
> *A2: The tone of voice is condescending and not professional. I like to see more back-up with facts and numbers.*
> *A3: Too much focus on emotions, whining about poisonous gasses but no facts as fundament for the claims.*

Table 2: *Results of Second Pretest*

Strong Q1	**Weak Q1**	**Strong Q2**	**Weak Q2**
N= 10	N=10	N=10	N=10
Mean: 4.1	Mean: 2.3	Mean: 3.9	Mean: 2.3
Std. Dev: .32	Std. Dev: .95	Std. Dev: .57	Std. Dev: .82

3.3 Instrument

A questionnaire was used for the data collection. The questionnaire measured six constructs with four items per construct measuring a total of 24 items. The items were measured with a five-point Likert scale ranging from ''totally disagree'' to ''totally agree''. Furthermore basic demographic data such as age, sex, level of education, income, family composition and type of house were collected keeping the questionnaire compact.

The scales used in the questionnaire have been validated by prior research. The English scales were translated to Dutch and when necessary altered to fit the advertisement. For some constructs there were not enough validated items available in which case an extra item was developed. All the data have been analyzed by means of SPSS. The research instrument can be found in appendix B**.**

3.4 Population/Sample

In order to reach respondents in an efficient and economical way, a snowball sampling technique was used. This non-probability sampling technique is very much suitable for an experimental study and allows for quick data collection (Babble, 2001). Data were gathered both online and offline as initially the online response was disappointing.

Firstly data were gathered through online information channels such as forums in which administrators were asked to spread the questionnaire among visitors. Secondly close relatives and friends were e-mailed with the request to spread the questionnaire among their friends and family. Initially two demographic constraints determined being that the respondents did not own a PV-installation but did own a house. During the online data gathering process it became clear that the constraint of owning a house would be too much of a limitation factor in reaching potential respondents. As such, this

constraint was deleted. Owning a PV-installation remained as a constraint since owners of PV-installations would be considered to be too knowledgeable in the field of renewable energy.

In order to reach a satisfactory sample, university students were addressed too, this time with a print-out instead of a digital questionnaire. This prove to be a successful method as within a week a gross response of N=46 was managed, distributed as EW N=12, ES N=12, SW N=17 and SS N=5.

Table three shows the total data gathered. Of the gross response of N=289 n=138 (over 47%) of the total response was unfit for further analysis due to quitting respondents and careless responses, leaving a net response of n=151.

Table 3: *Total Response*

Questionnaire	Total gross response	Total net response
Engineer weak (EW)	91	45
Engineer strong (ES)	72	34
Salesperson weak (SW)	62	36
Salesperson strong (SS)	64	36
Total	**289**	**151**

3.4.1 Demographic data of the population

All the respondents were asked to answer six short demographic questions related to sex, age, level of education, income, family composition and type of home. The answers to these questions were analyzed for the total population (N=151) and for the different groups (EW, ES, SW, SS). All the frequencies of the demographic variables per group can be found in appendix C.

Of the net N=151, 106 (70.2%) were male and 44 (29.8%) were female. Furthermore, only four (2.6%) of the participants owned a PV-installation. Since this percentage is low these four have not been deleted from the sample as it is expected that there will be very little bias coming from these participants.

Between the different groups (EW,ES,SW,SS) the demographic distribution is primarily homogeneous. For all the four groups the most common level of education is university level; 55.6% for EW, 40% for ES, 50% for SW and 35% for SS. The most common family composition is single without kids, 42.2% for EW, 48% for ES, 63.9% for SW, 51.4% for SS and the majority of the respondents is male varying from 67% for

EW, 76% for ES, 67% for SW and 75% for SS.

Furthermore three groups all had below average as the most common level of income, 43.8% for ES, 55.6% for SW and 51.4 % for SS. Only for the group EW the majority had an above average income level (49%) seconded by participants having a below average income level (36%). Looking at the variable age for both the groups EW (28.9%) and SS (45.9%) the majority of the respondents were between 25 and 34 years old while for the groups ES (45.5%) and SW (47.2) the majority of the respondents were below 25 years of age. The one demographic variable that did differ per group was type of home. For EW the most common type of home was a terraced house, for ES it was a duplex house, for SW it was both the apartment (31%) as well as the villa (31%), and for SS the majority lived in either an apartment (28%), terraced house (28%) or a villa (28%).

4.0 Results

This section will discuss the general results of the data analysis. The hypotheses will be answered and explained. The results of the data analysis will be presented in a systematic manner so that they are in accordance with the graphical representation (figure 1) of the hypotheses.

4.1 Reliability of instrument

To find out whether or not the instrument is reliable a reliability analysis test was conducted. Table ten provides an overview of the results.

Table 4: *Reliability of Constructs*

Construct	Cronbach's alpha	N items
Integrity	.92	4
Benevolence	.82	4
Ability	.90	4
Credibility (message)	.83	4
Attitude	.93	4
Intention	.86	4

The cronbach's alpha scores are very high for all the constructs with .82 being the lowest for the construct benevolence and .93 being the highest for the construct attitude. No items were deleted so

every individual construct was measured by four items. The high Cronbach's Alpha scores are also a clear indication that there is an internal consistency between the items and that the constructs are reliably measured.

4.2 General results and differences between groups

Chapter 4.2 will discuss the general results of the data analysis. The hypotheses will be answered and explained. The results of the data analysis will be presented in a systematic fashion so that they are in accordance with the graphical representation (graph 1) of the hypotheses.

4.2.1 Analysis of variance

A Two-way ANOVA analysis of the data shows that the type of source, engineer or salesperson, had no significant influence on any of the three constructs that account for trustworthiness, benevolence (F(1.149)=.46, P=.50), integrity (F(1.149)=1.38, P=.24), and ability (F(1.149)=2.07, P=.15). The expected main effect of hypothesis H1 did not occur and it can be concluded that the participants did not see an engineer as more trustworthy than a salesperson.

A comparable condition is applicable to the credibility of the message. The two-way ANOVA analysis of the data shows that argument strength, strong (M=2.75, SD= .76) or weak (M=2.63, SD=.99), had no significant influence on the credibility of the message (F(1.149)=.71, P=.40). In other words, the expected main effect of hypotheses H2 did not occur and it can be concluded that participants did not feel that strong or weak arguments positively or negatively influenced the credibility of the message.

Table 5: *Means and Std. Dev per per Questionnaire for Integrity*

Integrity	**Engineer Weak** **M S**	**Engineer Strong**	**Total**
	2.65 (1.16)	3.19 (.58)	2.88 (.99)
Integrity	**Salesperson Weak**	**salesperson Strong**	**Total**
	3.11 (.80)	3.00 (.83)	3.05 (.81)
Total	3.09 (.72)	2.86 (1.03)	2.97 (.91)

Table 6: *Means and Std. Dev per Questionnaire for Benevolence*

Benevolence	**Engineer Weak** **M S**	**Engineer Strong**	**Total**
	2.49 (1.09)	2.90 (.57)	2.66 (.92)
Benevolence	**Salesperson Weak**	**salesperson Strong**	**Total**
	2.77 (.67)	2.74 (.68)	2.75 (.67)
Total	2.62 (.93)	2.81 (.63)	2.71 (.81)

Table 7: *Means and Std. Dev per Questionnaire for Ability*

Ability	**Engineer Weak** **M S**	**Engineer Strong**	**Total**
	2.83 (1.13)	3.32 (.62)	3.04 (.97)
Ability	**Salesperson Weak**	**salesperson Strong**	**Total**
	3.26 (.71)	3.23 (.73)	3.24 (.72)
Total	3.02 (.98)	3.27 (.68)	3.14 (.86)

Table 8: *Means and Std. Dev per Questionnaire for Credibility*

Credibility	**Engineer Weak** **M S**	**Engineer Strong**	**Total**
	2.48 (1.10)	2.93 (.66)	2.67 (.95)
Credibility	**Salesperson Weak**	**salesperson Strong**	**Total**
	2.80 (.82)	2.58 (.82)	2.69 (.82)
Total	2.63 (.99)	2.75 (.76)	2.68 (.89)

Table 9: *Means and Std. Dev per Questionnaire for Attitude*

Attitude	**Engineer Weak** **M S**	**Engineer Strong**	**Total**
	3.61 (1.21)	3.31 (1.11)	3.48 (1.17)
Attitude	**Salesperson Weak**	**salesperson Strong**	**Total**
	3.47 (1.01)	3.75 (.90)	3.61 (.96)
Total	3.54 (1.12)	3.54 (1.02)	3.54 (1.07)

Table 10: *Means and Std. Dev per Questionnaire for Intention*

Intention	**Engineer Weak**	**Engineer Strong**	**Total**
	M S		
	2.08 (1.03)	2.24 (.77)	2.15 (.92)
Intention	**Salesperson Weak**	**salesperson Strong**	**Total**
	2.40 (.86)	2.28 (.82)	2.34 (.84)
Total	2.23 (.96)	2.26 (.79)	2.24 (.88)

However, the two-way ANOVA analysis showed a significant interaction effect between the type of source and the quality of the argument for one of the three constructs of source trustworthiness. For integrity (F(1.15)=5.06, P=.026) an engineer (M_{strong}=3.19, SD_{strong}=.58, M_{weak}=2.65, SD_{weak}=1.16) scored significantly higher on strong arguments than on weak arguments (t=2.50, P=0.02) regarding the integrity of the source. However, for salesperson (M_{strong}=3.00, SD_{strong}=.82, M_{weak}=3.11 SD_{weak}=.80) there is no proof that the mean scores for strong and weak arguments are significantly different (t=-.57, P=.57) regarding the integrity of the source. The results for benevolence (F(1.15)=2.89, P=.091) and ability (F(1.15)=3.57, P=.061) were not significant.

A similar interaction effect was found for source type and the quality of the argument on the credibility of the message (F(1.15)=4.27, P=.02). An engineer (M_{strong}=2.93, SD_{strong}=.66, M_{weak}=2.48, SD_{weak}=1.10) scored higher on strong arguments than on weak arguments (t=2.11, P=.04) regarding the credibility of the message. However, for a salesperson (M_{strong}=2.58, SD_{strong}=.82, M_{weak}=2.80 SD_{weak}=.82) there is no proof that the mean scores for strong and weak arguments are significantly different (t=-1.17, P=.25) regarding the credibility of the message.

Lastly it was researched if there was an interaction effect for source type and argument quality on the attitude and purchase intention of the respondent. No significant effect was determined for source type and the quality of the argument on the attitude towards the product (F(1.15)=2.70, P=.10). The same applies to the interaction effect for source type and argument quality on the purchase intention, the result was not significant (F(1.15)=.90, P=.34).

4.2.2 Model testing

The Pearson correlation coefficients test showed that there was a positive relation between source trustworthiness and message credibility. There is a positive relation between the trustworthiness of the source and the credibility of the message in the way that when a source is perceived as trustworthy the message will be perceived as more credible; benevolence (r=.65, P<.00), integrity (r=.80, P<.00), and ability (r=.72, P<.00). In this case hypothesis H3 can be accepted.

Furthermore a linear regression analysis shows that the three constructs that account for trustworthiness have a positive influence on the participants' attitude towards the product; benevolence (B=.50, t=5.03, P=<.00), integrity (B=.49, t=5.57, P=<.00), and ability (B=.48, t=5.09, P=<.00). In the model, the constructs benevolence, integrity and ability can predict for 17% (R^2 adjusted= .17) the attitude towards the product. It is safe to conclude that hypotheses H4a, H4b, and H4c can be accepted.

Hypothesis five can be accepted too as a linear regression analysis shows that credibility (B=.44, t=4.86, P=<.00) has a positive influence on the participants' attitude towards the product. However message credibility can only predict the attitude towards the product for 13% (R^2 adjusted= .13). When grouping the four variables, benevolence, integrity, ability and credibility together a R^2 adjusted=0.17 was obtained thus the combination of these variables can predict the attitude towards the product for 17%.

Lastly, hypothesis six can be accepted as a linear regression analysis shows that a positive attitude (B=.50, t=9.37, P<.00) will lead to a higher purchase intention and attitude towards the product can predict the purchase intention for 36.8% (R^2 adjusted= .37).

5.0 Discussion of Results

Six hypotheses and three exploratory questions were addressed in order to further, in depth, investigate current gaps in the literature. Of the six hypotheses four were accepted and the exploratory questions helped to create more insight in what the interaction effect is of combining source trustworthiness with message credibility. The study also showed how different sources influence the credibility of the message. Also, what effect high source trustworthiness and high message credibility have on the attitude towards the product and the effect of attitude on purchase intention. Furthermore the study distinguished what combination of source type and argument quality is perceived as most persuasive.

5.1 Conclusions

Firstly, no main effect was found for both source type and argument quality. Source type had no significant influence on the trustworthiness of the source which contradicts the findings of Gotlieb and Sarel's (1991) study. Gotlieb and Sarel (1991) determined that an engineer is perceived as more knowledgeable than a salesperson due to his/her level of scientific training and education and would therefore be perceived as more trustworthy. The absence of a main effect for source type might be due to prior experiences respondents had with the sources. It is possible that respondents had positive experiences with salespersons as well as engineers or perhaps they had no experience at all with an engineer and were therefore unable to determine a difference in trustworthiness between the two.

As for message credibility, the quality of the argument had no significant influence on the credibility of the message which contradicts the theory that states that the credibility of a message is greatly determined by the quality of the arguments that are being used (Areni & Lutz, 1988; Petty et al., 1983). It is possible that respondents indeed felt the arguments were clearly different in quality, as the pre-test shows, but also felt that none of the two texts did stand out as more credible than the other. Or, perhaps the respondents felt that both strong and weak arguments text were equally credible.

However, the variables source trustworthiness and message credibility do have a significant influence when they are combined. When an engineer uses strong arguments he is perceived to have more integrity than when he uses weak arguments. However, no significant interaction effect was determined

for ability and benevolence. An interaction effect applies to credibility too. When an engineer uses strong arguments, the message will be seen as more credible than when weak arguments are used. To a certain extend the expected direction of the interaction between source and message was met. The advertisement combination of engineer with strong arguments (ES) scored the highest on integrity with a score of 3.19 as opposed to EW=2.65, SS= 3.00 and SW= 3.11. The same applies to the scores for credibility, ES scores 2.93 as opposed to EW= 2.48, SS= 2.58 and SW= 2.80. It is possible that people focus more on the content of the message when faced with an engineer and when an engineer uses poor arguments people no longer see him as trustworthy as they expect him to use argumentation based on factual data and logic. Also, it is possible that people focus more on the honesty and sincerity of the given information than on the engineer's ability because they assume the engineer is an expert in his work field.

For the salesperson a different outcome was reached. Whether or not a salesperson uses weak or strong arguments it had no significant influence on the ability, benevolence or integrity of that salesperson. A similar outcome was achieved for message credibility. Whether or not a salesperson used strong or weak arguments it had no significant influence on the credibility of the message. It is possible that people do not believe or expect that a salesperson knows such detailed and technical aspects of the products being sold. Or perhaps people accept that a salesperson's goal is to sell products so they are less influenced by the content of the message.

Furthermore there was no significant interaction effect for source type and argument quality on the attitude and the purchase intention of the respondents. Although it is expected that the combination of an engineer with strong arguments will lead to an attitude change and a higher purchase intention there is no statistical proof to back this up. It is possible that there are other variables that influence the attitude towards the product as the R^2 for the four variables (integrity, ability, benevolence and credibility) is only 0.17.

As for the model testing all the related hypotheses can be accepted. Firstly there is a positive relation between source trustworthiness and message credibility. When a source is perceived as trustworthy, thus having high ability, benevolence and integrity, the message will automatically be perceived as more credible regardless if it contains strong or weak arguments. This outcome confirms the theory that disclosing the message source can positively influence the credibility of the message when that source is perceived as trustworthy and an expert (Eastin, 2006; Harkins & Petty, 1987; Newhagen & Nass, 1988).

The three constructs of trustworthiness, integrity, benevolence and ability, all significantly influenced the respondent's attitude towards the product confirming the theory that adding and

depicting a credible source will yield positive attitude change (Petty & Wegener, 1999; Verhoeven & Schellens, 2008; Wilson & Sherrell, 1993). A similar outcome applied to the credibility of a message. When a message is perceived as credible the attitude towards the product will be positively influenced, confirming the theory that strong arguments will yield greater attitude change (Verhoeven & Schellens, 2008). Also a positive attitude will account for an increased purchase intention thus confirming the theory of planned behavior (Ajzen, 1991).

Furthermore the R^2 adjusted values indicate that, although the model is correct, predictive value of source trustworthiness (16.6%) on attitude and message credibility (13%) on attitude is rather low. When combining the four variables (ability, benevolence, integrity and credibility) the predictive value rises to 17%. Over 80% of the attitude towards the product is determined by external undetermined variables. However the predictive value of attitude on purchase intention is 36.8% which also confirms the theory of planned behavior.

5.2 Limitations, suggestions for future research and practical implications

Despite careful development of this research there are various limitations to this study which will be addressed in this chapter. Furthermore suggestions for future research will be proposed and the practical implications will be discussed too.

5.2.1 Limitations

Although it has been tried to simulate the reality it is never a full realistic representation which means that people can react differently in a real world situation. Also, the study has been conducted in a rather isolated environment in which external stimuli are reduced. In real life situations external stimuli such as the TPB's subjective norm can significantly influence an individual's intention and behavior (Ajzen, 1991).

As a survey was used there was a limited level of control over the respondents. There remains a possibility that respondents give socially acceptable answers or perhaps give careless response for the sake of finishing the survey quickly (Breaugh & Colihan, 1994).

Furthermore, the sample and the sampling technique used can be identified as a limitation. Firstly respondents were reached through online message boards which led to a vast number of surveys that were unfit for statistical analysis. In order to obtain surveys fit for statistical analysis a snowball sampling method was used. Although this method is efficient there is also a community bias which became clear as soon as the demographic data was analyzed. A large number of respondents were male university students with a below average income. Since the advertisement entailed a persuasive message for solar panels (PV-installations) it is doubtful if university students are the best target group.

5.2.2 Future research recommendations

For both hypotheses one and two no main effect was determined even though the current literature indicates differently. It might be interesting to more in-depth research why the main effects for source type on source trustworthiness and argument quality on message credibility did not occur.
Also, integrity came out to be the most important antecedent of trustworthiness, when combining a trustworthy source with a credible message, even though modern marketing literature states that ability is a the most important antecedent in a sales process (Flanagin & Metzger, 2000). It is interesting to investigate why this is the case with the two expert sources.

Furthermore, the R^2 scores for the model were rather low. It is interesting to investigate what the undetermined external variables are that also influence the attitude towards the product.

As for research scope, focus can shift from male sources to female sources. The current research solely included male expert sources and Debevec and Kernan (1984) showed that, attractive, female sources have a more positive impact than male sources, especially among the male public.

Use has been made of strong and weak arguments conveying benefits (positive) about a technical product. It might be interesting to investigate the effect of strong and weak arguments conveying negative arguments about a product or event. Also, the research outcome of which is the most persuasive advertisement is related to the product sold, solar panels. Although it is a technical product it still is a rather niche market product. Differentiating to a more common, or non-technical product might yield different results as respondents simply know more about such product.

5.2.3 Practical implications

The research shows that combining an engineer with a message containing strong arguments will be perceived as the most persuasive advertisement combination when selling a technical product, in this case a PV-installation. Although it is expected that an advertisement with the combination of an engineer and strong arguments will lead to a high attitude change and a higher purchase intention there is no statistical proof for this claim. Also it became imminent that the integrity is more important than the ability and the benevolence of the engineer. Respondents feel that the engineer should provide honest and sincere advice that is based on logic and factual data. It is very important that an engineer does not resort to weak arguments as that will greatly decrease his trustworthiness.

When using a salesperson however it is of less importance to differentiate between strong and weak arguments although it is recommended to utilize an engineer in the process of selling technical products.

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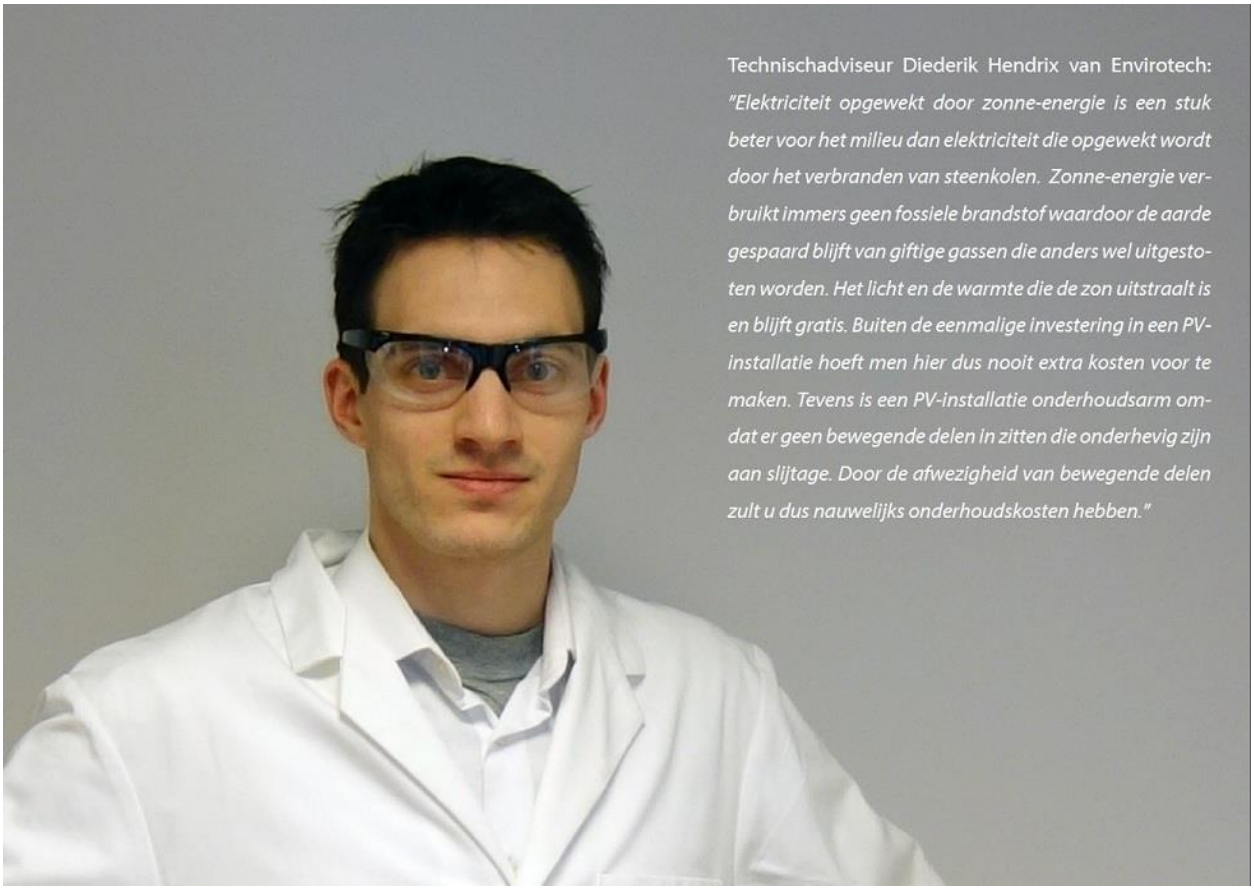
Appendix A

Picture 1: *Salesperson with Strong Arguments Text*

Picture 2: *Salesperson with Weak Arguments Text*

Picture 3: *Engineer with Strong Arguments Text*

Picture 4: *Engineer with Weak Arguments Text*



Appendix B

Final questionnaire that respondents were asked to fill in, after seeing one of the four advertisements presented in appendix A.

Ik ben in het bezit van een PV-installatie	**Ja/Nee**

Demographic constructs	**Items**
Geslacht	Man
	Vrouw
Leeftijd	<=24
	25-34
	35-44
	35-54
	55-64
	>=65
Hoogst genoten opleiding	Lagere school
	LBO/Mavo/vmbo
	Havo/VWO
	MBO
	HBO
	WO
Inkomen	Onder modaal
	Modaal (Euro 33.000,-/jaar CBS, 2012)
	boven modaal
	Zeg ik liever niet
Gezinssamenstelling	Alleenstaand zonder kinderen
	Alleenstaand met kinderen
	Gehuwd/samenwonend zonder kinderen
	Gehuwd/samenwonend met kinderen
Type huis	Appartement
	rijtjeshuis
	Twee-onder-een-kap woning
	vrijstaand huis

Integrity	Ik denk dat de adviseur zijn beloftes houdt
	Ik denk dat de adviseur de daad bij het woord voegt
	Ik denk dat de adviseur eerlijk is in het advies dat hij geeft
	Ik denk dat de adviseur oprecht is
Benevolence	Het welzijn van de klanten is belangrijk voor de adviseur
	De adviseur houdt rekening met de behoeftes van de klant
	De adviseur vindt het helpen van mensen belangrijker dan eigenbelang
	De adviseur heeft een sterk rechtvaardigheidsgevoel
Ability	Ik vind dat de adviseur zijn werk goed doet
	De adviseur is deskundig in het veld waarin hij werkt
	De adviseur heeft veel kennis van zijn vakgebied
	De adviseur is goed getraind in zijn vakgebied
Credibility	De gegeven informatie is accuraat
	De gegeven informatie is betrouwbaar
	De gegeven informatie is compleet
	De gegeven informatie is objectief
Attitude after advertisement	Het idee om zonnepanelen op mijn woning te hebben bevalt mij
	Ik sta positief tegenover het idee om een PV-installatie te bezitten
	Zelf stroom opwekken door middel van een PV-installatie spreekt mij aan
	De voordelen van een PV-installatie spreken mij aan
Intention to purchase	Ik ben geneigd om het aangeprezen product te kopen
	Ik ben van plan dit product zonder aarzelen aan te schaffen
	Ik ben van plan het product binnenkort te kopen
	De advertentie overtuigt om over te gaan tot aanschaf van een PV-installatie

Appendix C

Table 6: *Demographic Frequency table for the Engineer-Weak Combination*

Sex	N	Age	N	Education	N	Income	N	Family Comp.	N	Type Home	N
M	30	<-24	11	Primary school	1	Below avg.	16	Single no kids	19	Apart-ment	11
F	15	25-34	13	Havo/vwo	1	Avg.	2	Single with kids	1	Terraced house	14
		35-44	4	Mbo	0	Above avg.	22	Married/living together no kids	13	Duplex house	9
		45-54	12	Hbo	18	Private	5	Married/living together with kids	12	villa	11
		55-64	5	W.O.	25						
		65->	0								

Table 7: *Demographic Frequency table for the Engineer-Strong Combination*

Sex	N	Age	N	Education	N	Income	N	Family Comp.	N	Type Home	N
M	25	<-24	15	Primary school	0	Below avg.	15	Single no kids	16	Apart-ment	6
F	8	25-34	10	Havo/vwo	5	Avg.	9	Single with kids	1	Terraced house	7
		35-44	4	Mbo	8	Above avg.	5	Married/living together no kids	7	Duplex house	16
		45-54	2	Hbo	6	Private	3	Married/living together with kids	9	villa	3
		55-64	2	W.O.	13						
		65->	0								

Table 8: *Demographic Frequency table for the Salesperson-Weak Combination*

Sex	N	Age	N	Education	N	Income	N	Family Comp.	N	Type Home	N
M	24	<-24	17	Primary school	0	Below avg.	20	Single no kids	23	Apart-ment	11
F	12	25-34	11	Havo/vwo	5	Avg.	5	Single with kids	0	Terraced house	6
		35-44	2	Mbo	4	Above avg.	9	Married/living together no kids	4	Duplex house	8
		45-54	5	Hbo	9	Private	2	Married/living together with kids	7	villa	11
		55-64	1	W.O.	18						
		65->	0								

Table 9: *Demographic Frequency table for the Salesperson-Strong Combination*

Sex	N	Age	N	Education	N	Income	N	Family Comp.	N	Type Home	N
M	27	<-24	14	Primary school	1	Below avg.	19	Single no kids	24	Apart-ment	10
F	9	25-34	17	Havo/vwo	9	Avg.	5	Single with kids	0	Terraced house	10
		35-44	3	Mbo	8	Above avg.	8	Married/living together no kids	6	Duplex house	6
		45-54	3	Hbo	6	Private	5	Married/living together with kids	7	villa	10
		55-64	0	W.O.	13						
		65->	0								