O.3.2 USER SURVEY ABOUT HABITS

Document Control Sheet

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1. Rationale and structure of the Output

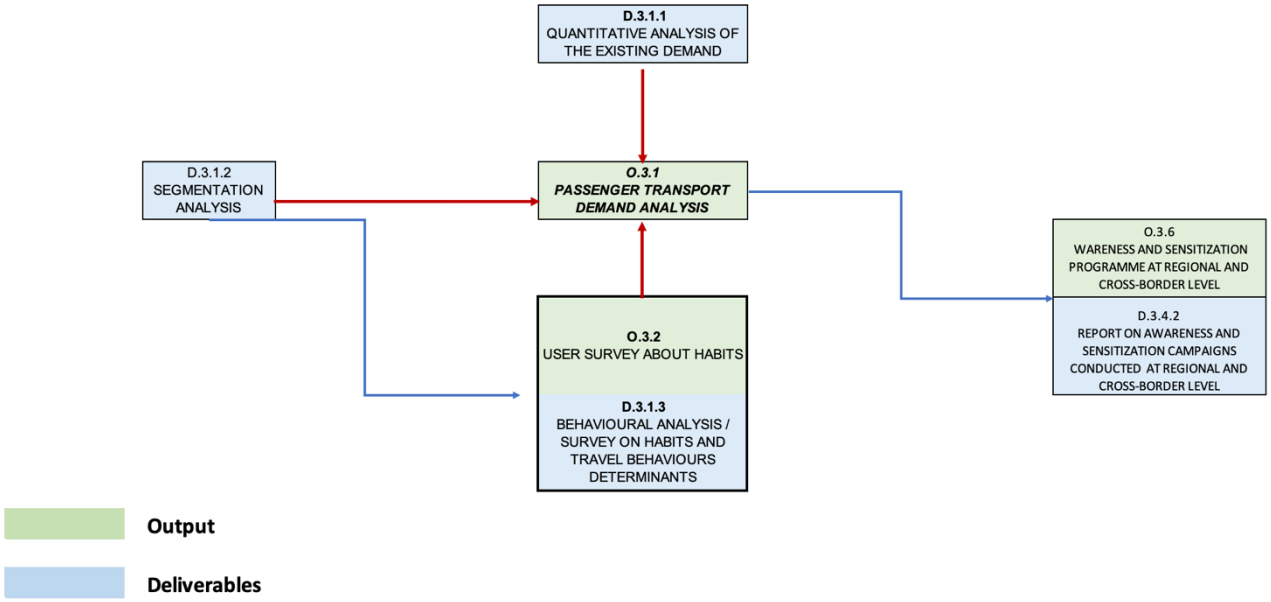
1.1. A tool to replicate the study

A specific output of the MIMOSA project is represented by the survey on Habits of actual and prospective travellers between Italy and Croatia. Main goal of this document is to illustrate and describe the methodological aspects connected to the drafting and distribution of the survey, together with a description of the methodology adopted for the statistical analysis of results. This is relevant as to provide a tool that can be adopted by actors willing to replicate a survey on the habits of travellers. The results of the data analysis and a discussion on the policy implications can be found in Deliverable 3.1.3.

The output stems from the evidence emerging from the data gathered through the questionnaire distributed in the framework of Deliverable 3.1.3 on the behavioural determinants of travel mode choice. The behavioural survey is broader as it also encompasses aspects and specific sections that do not pertain habits as behavioural determinants, such as for instance the section devoted to the effects of the ongoing Covid pandemic on travel mode determinants. While the full survey is available in deliverable 3.1.3, the current document is specifically devoted to Habits, as to describe the methodology for data collection and elaboration, ensuring as anticipated that the same methodology can be applied in future research aimed at investigating the same topic: in other words, to make the methodology replicable.

The connections between Output 3.2 and other selected activities and documents of the project with whom the links are stronger are depicted in the following figure:

Connection with other documents



1.2. A terminological caveat

A relevant caveat to the reader is the need to acquire a correct operationalization of the term habits, which is often used in everyday discourse yet it here assumes a specific meaning connected to social psychology and individual behaviour, which for the aim of the MIMOSA project refers to the empirical setting of cross-border mobility. Indeed, habits represent a crucial determinant of travel mode choice (both in urban/everyday trips and in cross-border trips): there is a wide literature on the topic, highlighting how habits bear the potential of playing as the key determinant in shaping our behavioural trajectories, and deliverable 3.1.3 provides a review of such literature.

1.3. Document structure

On the other hand, the present document will present the more operational aspects connected to the survey, including the methodology for the definition of the questions and the protocol for the drafting of the questionnaire, including information about the distribution of the survey and the sample of respondents (section 2), a specific section devoted to the operationalisation of habits (section 3) and other behavioural determinants (section 4), and an illustration of the fundaments of correlational analysis (section 5), whose complete results are illustrated and discussed in more detail in Deliverable 3.1.3, where policy options are proposed.

2. Survey methodology

The output is based on a questionnaire, which has been drafted according to a well-established methodology and widely agreed-upon protocols, that have been illustrated in detail in Deliverable 3.1.2. While such deliverable focuses on Segmentation, the approach for the definition of a sound methodological procedure for the definition and distribution of a questionnaire maintain their validity. Accordingly, also for the survey on habits the overall methodology and the single questions have been structured according to well-established protocols, following five stages of a) conceptualization, b) questionnaire design, c) revision and testing, d) data collection.

2.1. Conceptualization

The main output of this preliminary step is represented by a list of the variables that will be investigated in the survey. As regards the Output, the main variables are represented by Habits themselves (Section 3 will be once again devoted to their correct operationalization), behaviours and behavioural intentions we are interested in analysing (in our case, trips to Italy/Croatia and the transport mode chosen for such journeys), and other variables (to be illustrated in Section 4) that are considered as antecedents (along with habits) of our behavioural decisions. The selection of these variables (attitudes, subjective norms, and so on) has been based on a thorough analysis of the relevant literature, and on the main theoretical frameworks on travel mode choice (see Deliverable 3.1.3, section 2).

2.2. Questionnaire design

Like for the Segmentation analysis survey (see Deliverable 3.1.2, section 4), the final version of the questionnaire represents the result of a multi-step process, as different drafts of the survey have been structured, circulated among partners and integrated. As regards the behavioural analysis questionnaire of which habits represent a key aspect, the survey can be divided in the following thematic sections (see Deliverable 3.1.3, Annex 2 for the complete list of questions):

- Travel experiences to Italy-Croatia and travel modes
- Covid pandemic
- Habits

- Behavioral determinants of modal choice
- Socio-demographics

Guidelines have been followed for the specific formulation of the questions, in order to ensure the validity of the study (i.e., ensure the collection of appropriate data, measuring what it is intended to analyse).

As far as acceptability of the survey is concerned, specific attention has been paid to draft a questionnaire that is not too lengthy (this would increase dropout rate and affect the reliability of responses), is respectful of privacy of respondents (replies are anonymous and data would be analysed at an aggregate level, with no connection between a specific answer and the single respondent) and gives respondents the possibility to skip specific questions (this is relevant especially for sensible questions like those pertaining some socio-demographic aspects).

Like in the case of Deliverable 3.1.2, the choice of the type of questions has been between two main alternatives: open ended vs closed ended questions. An outline of the advantages and disadvantages of each type (as well as the sub-categories that can be found in empirical investigations) is available in Deliverable 3.1.2, Section 4. It here suffices to state that we opted for close ended questions due to i) the simplicity of analysis when the number of respondents is high, and ii) the fact that they are needed for quantitative analyses based on correlational techniques.

More specifically, most of the questions pertaining to habits and related behavioural determinants are of the following types:

i) **Likert scales**, where respondents are asked to express their agreement or disagreement with a statement.
They are easy to prepare and interpret, and simple to be understood by consumers. Example from the MIMOSA habits survey:
- On my next trip to Italy, I intend to use (...) as the main means:
(1 = entirely disagree; 5 = completely agree)

ii) **Behaviour-intention scales** measure the likelihood that respondents (will) act in a certain way, analysing the self-reported behaviours or the willingness to uptake a specific activity in the future.
Example from the MIMOSA habits survey:
- My intention to use (...) as the main means of traveling to Italy at the next occasion is: (1 = very weak; 5 = very strong)

Also, for the survey on habits the research group focused on the language to be adopted by the

questionnaire, and the key guidelines can be summarised as follows:

- sentences simple, straightforward and to the point,
- avoid jargon, highly technical language or abbreviations,
- avoid whenever possible double negatives,
- avoid ambiguous questions,
- avoid multipurpose questions, which may confuse the respondent by introducing two or more issues with the expectation of a single response.

The questions are based on scales that have been previously validated in literature.

2.3. Revision and testing

The survey has been drafted by the research group in English, circulated among partners to collect feedback and suggestions, and then integrated and revised, accordingly.
After the final version of the survey in English was drafted, it has been translated in the two languages of the programme area, Italian and Croatian. A pre-testing has been implemented for both versions of the survey, since some questions might look clear to those who drafted the survey, yet be confusing or misleading in the eyes of respondents, who are not familiar with all the process that led to the formulation of the questionnaire. Although it has not been the case of the present survey and no sensible questions were identified, it has been important to rule out possible sources of misunderstandings by circulating the draft of the survey among few respondents in each country, asking them feedback on the clarity of the questions and on the possibility for some of them to appear ambiguous or misleading.

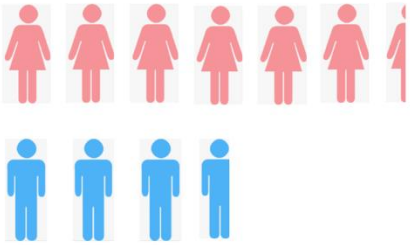
The two versions of the questionnaire have been at this point uploaded on the Qualtrics software, which provided two links (one for the Croatian and one for the Italian version) that have been circulated among project partners, who have been asked to support the distribution of the survey through their mailing lists, social networks and webpages.

2.4. Data collection and sample characteristics

The survey has been distributed through a link created by Qualtrics, and data have been collected over the October 24th 2021 – November 23rd 2021 period. Over this time-span, 556 replies have been collected. Of these respondents, 403 are from Italy and 153 from Croatia; as far as gender is concerned, Italian respondents 63% are female and 37% are male:

Italians represent over two thirds of the sample (72%)

Most respondents to the Habit survey are female (63%)



The main socio-demographics are synthesized below (see Deliverable 3.1.3, Section 4.2 for further details):

Table 1: Sample Socio-Demographics

Variable	Answers	%
Nationality	Italian	72
	Croatian	28
Age	18-22	10
	23-27	40
	28-35	17
	36-45	13
	46-55	13
	56-65	6
	>65	1
Gender	Male	37
	Female	63
Income	Much below average	5
	Below average	18
	Average	53
	Above average	22
	Much above average	2
Education	High school or lower	10
	Bachelor degree	47
	Master degree	36
	Doctorate	7
Occupation	Student	44
	Dependent worker	47
	Autonomous worker	6
	Unemployed	2
	Retired	1

3. Operationalisation of habits

3.1. What are Habits

In social psychology literature, habits do not refer solely to a behavioural pattern that is repeated over time: that is, past behaviors and habits represent two distinct (albeit correlated) constructs. The survey on habits, indeed, is not focused on how often respondents travel between the two Countries, although some questions in the surveys implemented for Deliverables 3.1.2 and 3.1.3 shed light on the topic. On the other hand, the specific focus of the survey on habits is to assess the strength of habits, and the effect that these have on the decision to choose a specific travel mode for the trip.

While for a more detailed discussion on habits we refer to Deliverable 3.1.3, it here suffices to remind how, besides the mere repetition of a behaviors, automaticity represents the key factor in determining the emergence of a genuine habit. Once more, the simple repetition of an activity can be considered as a necessary yet not sufficient condition for a habit to emerge. This can be seen in the following definitions of a habit:

- "Learned sequences of acts that have become automatic responses to specific cues, and are functional in obtaining certain goals or end-states" (Verplanken and Aarts, 1999)
- "Repeated behaviors that have become automatic responses in recurrent and stable contexts" (Verplanken, 2011)

3.2. How to measure Habits:

While different scales are available in literature to assess habit strength, we adopted The Self-Reported Habit Index (Verplanken & Orbell 2003) and, more specifically, a restricted version of the latter. Indeed, in the original formulation respondents are asked to express their agreement or disagreement on a battery of 12 statements. Consistently with literature and empirical investigations previously performed, we considered three items, that are reported as follows:

Choosing (each transport mode) to go to Italy/Croatia is something that:
- I do automatically
- it would make me feel weird if I didn't
- is typically me

Respondents could answer adopting a 1 to 5 scale, where 1 expressed complete disagreement and 5 complete agreement. The battery of questions was repeated for every single transport mode analysed: plane, car, car+ferry, ferry, coach/train, and bicycle.
So, for every single transport mode, a respondent gave three scores: the average of such scores has been used as a proxy of how habitual using that specific travel mode was for him/her. Let's consider the following example of a hypothetical respondent and his answers (in parenthesis):

Choosing an airplane to go to Croatia is something that:
- I do automatically (2)
- It would make me feel weird if I didn't (1)
- Is typically me (1)

The average of the three scores (2, 1 and 1) is 1.3, and has been used as proxy of how habitual it is for the respondent to take an airplane to get from Italy to Croatia: in the specific example, habit appears to be extremely weak (1.3 on a 1 to 5 scale, where 5 represents the situation where habit is extremely strong, and 1 the situation where habit is very weak).

The habit-related values that have been obtained as illustrated in the example are at the basis of the correlational analyses, presented in Section 5, whose results are illustrated and discussed in detail in Deliverable 3.1.3, Section 4.

4. Other behavioural determinants considered

We here focus on the part that directly pertains to habits. In doing so, we propose a table that illustrates for each transport mode the correlation of habits with other antecedents of behavioural choices. All these variables are described in detail in Deliverable 3.1.3, so we here briefly recap the basic concept, and how the construct has been operationalised and investigated. As for habits, the score representing the strength of each variable is obtained by calculating the average of the scores obtained on the different questions pertaining that specific variable.

Behaviours:
- How often did you use each of the following means of transportation to travel to Croatia? (1 = never; 5 = on every travel occasion)

Intentions:
- My intention to use (...) as the main means of traveling to Italy at the next occasion is: (1 = very weak; 5 = very strong)
- On my next trip to Italy, I intend to use (...) as the main means: (1 = entirely disagree; 5 = completely agree)

Attitudes *(representing the generic predisposition, positive or negative, towards an activity)*

- For me, using (...) as the main means of reaching Italy in the future would be (1 = very unpleasant; 5 = very pleasant)
- I consider it pleasant to use (...) as the main means of traveling from Croatia to Italy. (1 = entirely disagree; 5 = completely agree)

Subjective norms *(representing perceived social pressure)*

- If I used (…) as my main means to go to Italy, the people close to me would be (1 = very sorry; 5 = very happy)
- People I know (and whose opinion is important to me) would approve if, to travel to Italy, I used as the main means (...) (1 = entirely disagree; 5 = completely agree)

Perceived Behavioural Control *(how respondents perceive being capable of performing an activity)*

- For me, using (...) to travel to Italy would be (1 = extremely complicated; 5 = extremely simple)
- The choice of specifically using (...) to travel to Italy (1 = it is something that does not depend on me; 5 = it depends exclusively on me)

Personal Norms *(representing perceived moral obligations towards sustainability)*

- When choosing the means of transport to go abroad, I feel that it is my duty to take into consideration the environmental consequences of this choice as well. (1 = entirely disagree; 5 = completely agree)
- Regardless of what others do, I feel morally obliged to always minimize the impact on the environment of my transport choices, even when I travel abroad. (1 = entirely disagree; 5 = completely agree)

5. Correlational Analysis

While the results of the analysis of correlation are illustrated and discussed in the Deliverable 3.1.3, it is worth stressing the main concept and ratio of the technique. The main idea is that we want to investigate the correlation (that is, the relationship) between specific variables (including habits) and our intentions and actual behaviours: what is the link, and whether "they move in the same direction". For instance, we want to investigate whether the more positive the social pressure I perceive towards the use of a specific travel mode to for my trip to Croatia, the stronger my intention to choose that specific option.

5.1. Correlation

Correlation, as specified in other documents of the project, represents the statistical relationship between the different variables that we consider in the analysis, measuring how these move in relation to one another, and it can assume values ranging from -1 (perfect negative correlation) and +1 (perfect correlation).

While in Deliverable 3.1.3 Section 4.3 the results and the significant correlations between constructs for every transport mode are illustrated and discussed, it is here important to stress the methodology for the analysis.

The following Table is taken from the Deliverable on behavioral analysis, and it represents the correlation matrix in the specific case of bicycles. Data analysis provided one correlation table for each of the transport modes analyzed (cars, trains/coaches, etc.).

Table 2: Correlation Matrix (bicycles)

	PBC	SN	PN	HAB	INT	BEH
ATT	0,2944364	0,6124731	0,2715361	0,359228	0,7482689	0,2633544
PBC		0,3064665	0,0838577	0,1552069	0,2216704	0,1945916
SN			0,1827182	0,1741825	0,4964211	0,1870379
PN				0,1448615	0,2722285	0,0350556
HAB					0,4408057	0,4609352
INT						0,3351781

If we look at the correlation matrix, it is possible to see the correlation between each couple of variables. In the example provided all correlations are positive, but there could be cases where there is a negative correlation between two constructs. For instance, in the correlation matrix of private cars there is a negative correlation between the actual behaviour (going to Italy or Croatia driving by car) and personal norms, which are the variable mirroring the environmental predisposition of respondents: this is consistent with the fact that the more environmentally friendly a person, the less likely to opt for a travel mode that is considered by many as polluting.

Going back to the present table, we can look for instance at the relationship between attitudes (ATT) and intentions (INT): in this case there is a high positive correlation (0.75), which means that the two variables are strictly linked and, the more individuals display positive attitudes towards cycling, the more they actually develop the intention to choose bicycle as the transport mode (if one variable increases, so does the other). As already specified in the Deliverable, "since attitudes represent how people enjoy doing a specific activity, the results show in this case that people who like cycling actually develop the intention to use the bicycle to go to Italy/Croatia. However, we can see that the relationship between attitudes and actual behaviours (BEH) is much weaker (0.26). This means that although people enjoying bicycles develop the intention to use it as transport mode, few of them actually do so, for instance for the lack of infrastructures making this alternative viable. This result is confirmed also by the low correlation between intentions and behaviours (0.36), so that once again it is difficult to walk the talk, as a consequence of the attitude-behaviour and intention-behaviour gaps."

So, the analysis of available data gathered from the survey on habits provides information about the correlation between behaviours and intentions of interest (that is, travelling to Italy or Croatia using a specific transport mode) and a set of factors that influence that specific choice, which can be labeled as behavioural determinants (or predictors). Habits are a key predictor of behaviours, as shown by many empirical investigations (see Deliverable 3.1.3).

Although correlation does not necessarily imply causality, it is clear that analyzing correlation matrixes provides operators and policy makers with useful insights on what drives behavioural choices and, as a consequence, on which levers to act in order to change behavioural patterns of travellers and make them consistent with envisaged goals. For instance, if it emerges that there is no correlation at all between personal norms (once again, a proxy of pro-environmental predispositions) and behaviours or intentions, the take-home message could be that, with the exception of small segments of environmentalists, strategies to make travellers opt for sustainable alternatives to private

mobility focusing heavily on the environmental consequences of the trip could be scarcely effective.

5.2. Significance

The correlation coefficient alone, however, is not sufficient to provide a clear explanation of the relationship between two variables. Indeed, it is important to report also the significance of the correlation itself. The significance is crucial insofar the scope of the analysis is not to investigate the features of the sample of 556 respondents per se, but rather to make inferences about all travellers between the two Countries object of the study: in other words, it is important that results that we gathered from the sample can be generalized to the entire population of interest. This is what statistical significance tests do, analysing whether the observed results in the sample are expected to be true in the general population. We can say that significance is at the very core of the concept of inference: the goal of the study is to make inferences about a population (individuals travelling between Italy and Croatia) based on a sample of the population (the 556 respondents of the survey).

5.3. P-value

Significance of a correlation can be assessed using the p-value parameter. P-value mirrors the probability that a correlation between two variables (for instance, between habit strength and behavioral intention) which is found in the analysis of collected data is due to chance, rather than to a real relationship between the two. As specified in Deliverable 3.1.3, we put the threshold at $p<0.05$, which is consistent with social psychology literature on mobility behaviors and travel mode choice. The following table illustrates, once again for the bicycle option, the significance of every correlation previously detected. The results that we consider significant are those for which the p-value is less than 0.05: that is, less than 5% that such correlation is due to chance.

Table 3: Significance

	PBC	SN	PN	HAB	INT	BEH
ATT	4,1998E-26	6,1181E-06	2,1445E-75	5,8303E-10	0,00013895	2,8631E-21
PBC		4,7926E-10	4,714E-24	6,2205E-60	1,449E-48	7,9609E-86
SN			9,9406E-50	9,4303E-25	1,5392E-16	3,3225E-41
PN				2,255E-111	2,30E-106	1,176E-137
HAB					0,00127919	1,0857E-05
INT						2,26E-12

So, if we combine the correlations in Table 2 and the p-values (that is, the significance) in Table 3 we have a clear picture of those relationships for which we can make strong inferences. It is important to note that if a correlation is not significant it does not mean that there is no relationship between the variables: it only means, on the other hand, that given the available data we cannot make inferences, we do not know whether the correlation is actually present in the general population.

6. Results

While the present document is structured as to provide a methodological overview on the Habits Survey, so it can be replicated and the tool can be adopted in similar studies to be performed in the future, Deliverable 3.1.3 provides a detailed overview of the results, as well as the policy implications that can be drawn. Without being redundant, we can here conclude by reporting the main take-home messages specifically dealing with habits (and, more in general, correlation analysis) that have been highlighted in the deliverable:

i) **environmental issues are not considered as a relevant driver by a large majority of respondents.**
ii) **positive attitudes towards more sustainable travel modes often fail to translate into actual behaviours.**
iii) **habits are stronger for people driving with private cars.**