



Adaptation and Validation of the Melbourne Decision-Making Questionnaire in a Sample of Moroccan Young Adults

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Abstract

Individuals make decisions in different styles. The Decision-Making Style (DMS) influences personal development and predicts important clinical indicators. This research aimed to adapt and validate the Melbourne Decision-Making Questionnaire (MDMQ) in the Moroccan context. This questionnaire allows us to identify four DMSs: vigilance, buck-passing, procrastination, and hypervigilance. The factor analysis confirms the four dimensions proposed by the authors of MDMQ. The internal consistency and means of the four DMSs obtained are almost identical to those obtained in previous studies. The intercorrelations of the subscales are consistent with the four-factor theoretical model of Jannis and Mann's conflict theory of decision-making. The psychometric characteristics obtained from this study justify the applicability of the MDMQ to Arabic-speaking young adults in Morocco. This measure may be applied in a variety of disciplines, including education and management.

Key words: Adaptation; Arabic version; decision-making style; instrument; validation

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1. Introduction

Decision-Making means choosing one option over another in order to achieve a specified objective (Miller & Byrnes, 2001). The decision-making style (DMS) is defined as the way individuals tend to behave in most situations that require making a decision (Magnano et al., 2015). The DMS differ from one another depending on personal preferences. A group of studies concluded that individuals have more than one DMS, but they differ in their most common one, through the method of gathering information about the preferred choice, the manner in which the possible alternatives are considered, and the meaning given to the information that was gathered (Davids et al., 2016); that is, individuals have one dominant style that distinguishes them whenever they make a decision (Harren, 1979).

DMS influences the development of adolescents and young adults, as it directly affects, for example, self-efficacy and self-esteem (Magnano et al., 2015), self-discipline (Halama & Pitel, 2016), and self-concept (Kvitkovičová et al., 2017), emotional intelligence (Phang, 2020), and life satisfaction (Wright et al., 2017). DMS has also been shown to have a direct effect on the motivation to use alcohol (Jang et al., 2019). Additionally, previous studies have been shown to predict significant clinical indicators including stress, well-being, and depressive symptoms (Bavolar & Bacikova-Sleskova, 2020).

The Melbourne Decision-Making Questionnaire (MDMQ), consisting of 22 items, is a revised version of the Flinders Questionnaire, which is based on the conflict theory of decision-making and mainly on the fact that the need to decide creates a kind of conflict for an individual because the intensity of the psychological stress generated by this situation is the main determinant of an individual's decision style (Mann et al., 1997). MDMQ has been adopted in many studies as a measurement tool, such as the study on the “association of decision-making with symptoms of depression among adolescents” (Ormond et al., 1991), a “metacognitive analysis of adolescent decision-making” (Okwumabua et al., 2003), “the relationship between basic humanitarian principles and decision-making styles in adolescents” (Páez Gallego et al., 2020), “decision-making styles and study orientation” (Govind & Amalor, 2016), and “self-efficacy and decision-making styles in adults” (Christopher et al., 2021). However, the authors of the MDMQ recommend adopting the revised version, which consists of four scales instead of the previous one's six (Mann et al., 1997). The MDMQ consists of the following four subscales: vigilance, which is considered the best style for decision-making as the individual carefully examines all possible alternatives and the consequences that may result from them before making a decision; hypervigilance, which is the tendency to make a hasty decision based on available information in order to relieve the stress caused by the decisional situation; buck-passing, which is based on shifting the responsibility to others to decide in order to escape the possible consequences resulting from that decision; and procrastination, which is a strategy that individuals tend to use to relieve stress by postponing decisions. The MDMQ has been adapted and standardized from English into different languages, such as Japanese, Mandarin and Cantonese (Mann et al., 1997), Swedish (Isaksson et al., 2014), Spanish (De Heredia et al., 2004), Portuguese (Cotrena et al., 2017) and French (Bailly & Ilharragorry-Devaux, 2011).

Despite the importance of this questionnaire and its widespread use in different countries, to the best of our knowledge, it has not yet been adapted to the Moroccan context, and therefore, the validation of this measure will be a valuable addition to research on decision-making in particular. This study was conducted within the context of our doctoral project entitled “Decision-Making Styles and Parental Attachment”.

2. Methodology

2.1. Participants

According to a review of published studies about instrument validation, $N = 100$ is considered the minimum sample size to conduct a factor analysis (Anthoine et al., 2014). 100 individuals from different cities in Morocco participated in this study; 55% of them are male and 45% are female. For the purpose of our thesis project, we chose an age range of 19 to 25. All participants are students; 83% of them are single and 17% are married. The majority of participants have a relatively high level of education.

2.2. Instrument

The MDMQ consists of 22 items, which describe the tendencies that individuals may exhibit facing each situation, and are categorized into four subscales (Mann et al., 1997): *vigilance* (6 items), (e.g., “I try to be clear about my objectives before choosing”); *hypervigilance* (5 items), (e.g., “I cannot think straight if I have to make decisions in a hurry”); *buck-passing* (e.g., “I do not make decisions unless I really have to”), and *procrastination* (e.g., “Even after I have made a decision I delay acting upon it”). The respondent checks one of the following options to answer the item: ‘True for me’ (Score 2), ‘Sometimes true’ (Score 1), and ‘Not true for me’ (Score 0).

To adapt the questionnaire to the Moroccan context, a series of actions were taken (Vallerand, 1989). As a first step, the committee's technique was adopted to translate and prepare the first version of the questionnaire. The questionnaire was translated from English into Arabic by the first author, and then both, the translated and the original version were sent to three university professors of psychology, to compare and verify the accuracy of the meaning. Following that, the first and second authors adjusted the translated version, based on the professors' comments, and sent it, along with the original questionnaire, to an expert in translation from and into the two languages, to check linguistic accuracy. Finally, the original version was adjusted by the two authors to check how accurately the translated items represented the scale's original meaning. Care was taken to maintain the original format and instructions in the Arabic version, to ensure internal consistency and stability of the questionnaire (Vallerand, 1989). The Arabic version of the MDMQ with the items, standardized factor loadings, and squared multiple correlations is shown in Table 8.

2.3. Data collection

We relied on Google Forms in order to pass the MDMQ online. The link to participate in the questionnaire was shared on social networks, with the help of some members of student groups. The first section was dedicated to welcoming the participants, thanking them for volunteering to participate in this project, explaining the purpose of the questionnaire, and informing them of a number of conditions, the most important of which is the privacy and free consent to participate.

2.4. Pilot study

After the adaptation was completed, and before administering the test to the research sample, a pilot study was performed to determine if the translated instrument was appropriate in the Moroccan context. The instrument was tested among a convenience sample of 32 students, following Haccoun's (1987) unique approach. It's an interesting approach to testing the concurrent and content validity as well as the test-retest reliability of the psychological instrument at the same time, by asking the same group of bilingual subjects to respond to the translated and original versions of the instrument two times with an interval between the two administrations. It

is possible then to verify the relationship between the original and the translated versions and compare the test-retest correlations, which should be almost similar (Vallerand, 1989).

As a first step, we sought the help of some university students to help us gather volunteers to participate in this study. We explained to them the purpose of the study and the conditions for participation, namely, the age of the participants (they had to be between 19 and 25 years old) and their bilingualism (in both Arabic and English). The location and time have already been determined. Forty volunteers attended the appointment in the library of the university. After welcoming and thanking them for their voluntarism, they were reminded of the purpose of the study as well as the different steps to follow. The first step consisted of administering the bilingualism scale to test their degree of bilingualism, following the technique developed by Vallerand & Halliwell (1983). This technique consists of determining the degree of fluency of the following skills: reading, writing, and understanding conversation and expression, on a scale ranging from 1 (very little) to 4 (fluent) for both languages. Only participants with a minimum score of 12 in each language will be chosen. Therefore, 32 students (21 females and 11 males) were selected. All students have a relatively high level of education (1st–5th years). Then, the participants signed the free and informed consent to participate in this study, and filled in an identifying card. Then we administered the two surveys, the translated and the original version. In the end, we thanked the participants, and scheduled the next session for two weeks later in the same location, to complete the questionnaires for the second time.

Table 1: Internal consistency of the Melbourne Decision-Making Questionnaire' scales
Haccoun's (1987) method

Subscales	1 st Administration Arabic	1 st Administration English	2 nd Administration Arabic	2 nd Administration English
Vigilance	0.828	0.754	0.713	0.800
Hypervigilance	0.735	0.730	0.788	0.759
Procrastination	0.855	0.814	0.810	0.832
Buck-passing	0.767	0.742	0.704	0.733

The internal consistency of the four subscales utilizing standardized alpha coefficients in the original and translated versions' first and second administrations is satisfactory (Table 1).

Table 2: The intercorrelations of the four decision-making scales Arabic and English version in the 1st administration

	Vigilance Ara1	Procrastination Ara1	Hypervigilance Ara1	Buck-passing Ara1
Vigilance Eng1	,980**	-,415*	-,0215	-,574**
Procrastination Eng1	-,361*	,985**	0,090	0,135
Hypervigilance Eng1	-,0158	0,056	,987**	,406*
Buck-passing Eng1	-,599**	0,182	,407*	,988**

Note: N = 32, Significance: ** P ≤ 0.01, * P ≤ 0.05

Table 3: The intercorrelations of the four decision-making scales of the Arabic version (1st and 2nd administration)

	Vigilance Ara2	Procrastination Ara2	Buck-passing Ara2	Hypervigilance Ara2
Vigilance Ara1	,968**	-,405*	-,568**	-,0182
Procrastination Ara1	-,0343	,979**	0,196	0,141
Hypervigilance Ara1	-,0192	0,063	,403*	,955**
Buck-passing Ara1	-,601**	0,261	,987**	,385*

Note: N = 32, Significance: ** P ≤ 0.01, * P ≤ 0.05

Table 4: The intercorrelations of the four decision-making scales of the Arabic version in the 1st administration and English version in the 2nd administration

	Vigilance Eng2	Procrastination Eng2	Hypervigilance Eng2	Buck-passing Eng2
Vigilance Ara1	,979**	-,443*	-0,226	-,573**
Procrastination Ara1	-,420*	,972**	0,109	0,186
Hypervigilance Ara1	-0,256	0,125	,984**	,439*
Buck-passing Ara1	-,551**	0,202	,413*	,973**

Note: N = 32, Significance: ** P ≤ 0.01, * P ≤ 0.05

Table 5: The intercorrelations of the four decision-making scales of the English version in the 1st and 2nd administration

	Vigilance Eng1	Procrastination Eng1	Hypervigilance Eng1	Buck-passing Eng1
Vigilance Eng2	,946**	-,392*	-0,198	-,545**
Procrastination Eng2	-,470**	,949**	0,085	0,202
Hypervigilance Eng2	-0,220	0,113	,972**	,413*
Buck-passing Eng2	-,541**	0,138	,429*	,954**

Note: N = 32, significance: ** P ≤ 0.01, * P ≤ 0.05

Table 6: The intercorrelations of the four decision-making scales of the Arabic and English version in the 2nd administration

	Vigilance Ara2	Procrastination Ara2	Buck-passing Ara2	Hypervigilance Ara2
Vigilance Eng2	,942**	-,407*	-,514**	-0,220
Procrastination Eng2	-,391*	,947**	0,212	0,151
Hypervigilance Eng2	-0,195	0,081	,406*	,976**
Buck-passing Eng2	-,563**	0,264	,963**	,424*

Note: N = 32, Significance: ** P ≤ 0.01, * P ≤ 0.05

Table 7: The intercorrelations of the four decision-making scales of the English version in the 1st administration and the Arabic version in the 2nd administration

	Vigilance Eng1	Procrastination Eng1	Hypervigilance Eng1	Buck-passing Eng1
Vigilance Ara2	,948**	-0,303	-0,141	-,583**
Procrastination Ara2	-,423*	,964**	0,022	0,263
Buck-passing Ara2	-,539**	0,147	,394*	,978**
Hypervigilance Ara2	-0,171	0,147	,942**	,390*

Note: N = 32, Significance: ** P ≤ 0.01, * P ≤ 0.05

Using SPSS 23, the intercorrelations of the four decision-making scales of the arabic and english versions in the 1st administration (Table2), the arabic version in the 1st and 2nd administration (Table 3), the arabic version in the 1st administration and the english version in the 2nd one (Table 4), the english version in the 1st and 2nd administration (Table 5), the arabic and english version in the 2nd administration (Table 6), and the english version in the 1st administration and the arabic version in the 2nd administration (Table 7), show a strong correlation (≥ 0.90 at $p < 0.001$). The vigilance scale has a negative correlation with the other three scales. The correlations between the hypervigilance, procrastination, and buck-passing scales, on the other hand, are positive. The results are almost identical in all examined correlations proposed by Haccoun's (1987), as shown in Figure 1. These findings are consistent with Jannis and Mann's (1997) theoretical model, which considers vigilance as an adaptive DMS and hypervigilance, procrastination, and buck-passing scales as maladaptive DMS (Mann et al., 1997).

2.5. Analytical procedure

Confirmatory factor analyses were performed on the 22 selected scale items using SPSS AMOS 23 to assess the Goodness-of-Fit between the hypothesized and observed data. The Goodness-of-Fit Index (GFI), the Adjusted Goodness-of Fit Index (AGFI), and the Root Mean Square Error of Approximation (RMSEA) are used for this purpose. A model is considered to be appropriate if the GFI and AGFI are more than 0.9 (Tabachnik & Fidell, 2001) and the RMSEA is between 0.5 and 0.8. (Hu & Bentler, 1999).

3. Results

The acquired results are nearly equivalent to those of Mann et al. (1997), with the exception of the RMSEA index, which is not accessible in SPSS AMOS 23, and to those of previous studies with minor variations according to the country. The following parameters were obtained from the CFA for the 22-item scale: RMSEA=0.05, GFI= 0.8, and AGFI=0.79. These findings are the same as those obtained in the studies by Mann et al. (1997) conducted in Japan (GFI= 0.81 and AGFI=0.76) and New Zealand (GFI=0.78 and AGFI= 0.72). Regarding the validation studies of the MDMQ by De Heredia et al. (2004) in the Spanish language (RMSEA= 0.08, GFI=0.85 and AGFI=0.81) and a recent one in the French language by Bailly& Ilharragorry-Devaux (2011) (RMSEA= 0.06, GFI=0.90 and AGFI=0.87), the results were nearly equivalents. To validate these findings, other parameters were calculated.

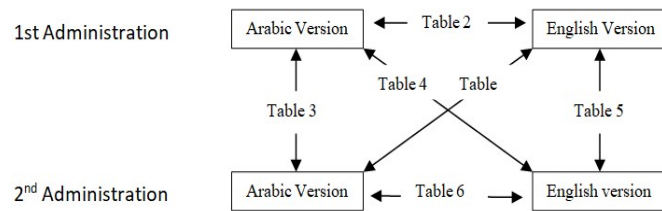


Figure 1: An illustrative diagram of the pilot study procedure according to the Haccoun's (1987) method

3.1. Confirmatory Factor analysis

To confirm the previous finding, a second factor analysis was performed in SPSS 23 using the principal components method, restricting the number of factors to be extracted at 4, using Varimax rotation, and deleting any coefficients with a loading value lower than 0.40. The results found and summarized in Table 8 are consistent with those of the first study. The factors

corresponding to each subscale are saturated with respect to the items. The standardized alpha coefficient for vigilance is 0.85, hypervigilance is 0.74, procrastination is 0.79, and buck-passing is 0.71, indicating that the internal consistency of the subscales is excellent. The results are similar to those found by Mann et al. (1997) in their research, which are 0.80, 0.74, 0.81, and 0.87, respectively, with the exception of the buck-passing, which is a little high for our sample.

Table 8: The Arabic version of the Melbourne Decision Making Questionnaire
The items, standardized factor loadings, and squared multiple correlations (N=100)

Scales /items	Loading	R2
Vigilance (M=8.65, SD= 2.99), alpha 0.85		
2- أحب أن أخذ في الاعتبار جميع البدائل الممكنة (I like to consider all of the alternatives)	0.76	0.50
4- أحاول كشف عيوب البدائل كلها (I try to find out the disadvantages of all alternatives)	0.79	0.41
6- أفكر في أفضل السبل لتنفيذ القرار (I consider how best to carry out a decision)	0.77	0.50
8- أحب جمع الكثير من المعلومات (When making decisions I like to collect lots of information)	0.68	0.42
8- عند اتخاذ أي قرار		
أحاول أن أكون واضحًا بشأن أهدافي قبل الاختيار (I try to be clear about my objectives before choosing)	0.60	0.38
12- الاختيار		
16- أركز كثيرا قبل الإختيار (I take a lot of care before choosing)	0.67	0.38
Procrastination (M=4.53, SD=2.72), alpha 0.79		
5- أضيع الكثير من الوقت في التفاهات قبل التوصل إلى قرار نهائي (I waste a lot of time on trivial matters before getting to the final decision)	0.70	0.41
حتى بعد اتخاذ قرار ما أو جل أمر (Even after I have made a decision, I delay acting upon it)	0.66	0.28
7- تنفيذه		
10- عندما يتوجب علي اتخاذ قرار ما، أنتظر كثيرا قبل الشروع في التفكير فيه (When I have to make a decision, I wait a long time before starting to think about it)	0.65	0.27
18- أو جل اتخاذ القرارات حتى فوات الأوان (I delay making decisions until it is too late)	0.77	0.42
21- أو جل اتخاذ القرارات (I put off making decisions)	0.74	0.33
Hypervigilance (M=5.24, SD= 2.15), alpha 0.74		
1- حينما أود اتخاذ قرار ما أشعر كما لو أنني تحت ضغط زمني كبير (I feel as if I'm under tremendous time pressure when making decisions)	0.66	0.29
13- مجرد احتمال حدوث خطأ بسيط يجعلني أغير إختياري (The possibility that small things might go wrong causes me to swing abruptly in my preferences)	0.72	0.32
15- كلما واجهت قرارا صعبا إلا و شعرت بتشاؤم حول إمكانية إيجاد حل (Whenever I face a difficult decision, I feel pessimistic about finding a good solution)	0.70	0.31
20- بعد اتخاذ قرار ما أفضي وقتا طويلا في إقناع نفسي بأنه كان قرارا صحيحا (After a decision is made, I spend a lot of time convincing myself it was correct)	0.67	0.25
22- لا أستطيع التفكير بشكل صحيح إذا اضطررت إلى اتخاذ قرارات مستعجلة (I cannot think straight if I have to make decisions in a hurry)	0.70	0.25
Buck-passing (M=6.01, SD= 2.70), alpha 0.71		
3- أفضل ترك القرارات للآخرين (I prefer to leave decisions to others)	0.58	0.46
9- أتجنب اتخاذ القرارات (I avoid making decisions)	0.55	0.43
لا أحب أن أتحمّل مسؤولية اتخاذ القرارات (I do not like to take responsibility for making decisions)	0.44	0.28
11- القرارات		
14- إذا كان بالإمكان اتخاذ قرارا من قبلي أو من قبل شخص آخر ، فإنني أترك للشخص الآخر مهمة أخذه (If a decision can be made by me or another person, I let the other person make it)	0.68	0.07
17- لا أتخذ القرارات إلا إذا اضطررت لذلك (I do not make decisions unless I really have to)	0.54	0.21
أفضل أن يقرر عني من هم أفضل (I prefer that people who are better informed decide for me)	0.43	0.23
19- مني إطلاعا		

Note: M: Mean, SD: Standard Deviation

The most prevalent style among the study's participants was vigilance (M= 8.65; SD= 2.99), followed by buck-passing (M=6.01; SD= 2.70), hypervigilance (M=5.24; SD=2.15), and procrastination (M=4.53; SD= 2.72). Only the back-passing yielded a higher average than in Mann's (1997) study; otherwise, the averages found are nearly identical to his study. However, the DMS in the current study remains to be prevalent as in the prior study. Table 8 details standardized factor loadings and their squared multiple correlations.

Table 9: The intercorrelations of the four decision-making scales of the Melbourne Decision-Making Questionnaire

	Vigilance	Procrastination	Hypervigilance	Buck-passing
Vigilance		-,420**	-0,182	-,583**
Procrastination			,228*	,280**
Hypervigilance				,271**

Note: N = 100, Significance: ** P ≤ 0.01, * P ≤ 0.05

Hypervigilance, buck-passing, and procrastination are the three DMSs that are positively correlated with one another, or in other words, participants who tend to adopt one of these styles also use the other two styles, according to the results of the correlation between the subscales (Table 9). The vigilance style is, however, negatively correlated with the other three styles, indicating that individuals who adopt vigilance “the adapted” style, are distant from making decisions in the “non-adapted” style. The four-factor theoretical model of Jannis and Mann's (1997) conflict theory of decision-making is supported by these findings.

4. Discussion

The aim of this study is to adapt and validate the MDMQ in the Moroccan context, in order to use it in our doctoral project, entitled “Decision-making styles and parental attachment”. Before applying the test to the research sample, we used Haccoun's (1987) unique approach for bilinguals, to perform a pilot study, that allows us to simultaneously examine the scale's concurrent and content validity, as well as the reliability of the test-retest. Significant correlations were found between the questionnaire scales, which should be statistically comprised between 0.7 and 1 (Akoglu, 2018). We used a homogenous sample of students who are all between the ages of 19 and 25, and that may explain the similarity of results obtained and the ones of Mann et al. (1997). The results of Bailly & Ilharragorry-Devaux (2011) differ slightly from those of Mann et al. (1997), which can be attributed to the study sample's heterogeneity, which included not only students but also adults who practice professional activities and adults with children and family responsibilities. Therefore, this may have an impact on decision-making processes either directly or indirectly. Goodness-of-fit indicators of the four factors model of (22 items) and the alpha coefficients for each scale in the present study are moreover closer to the study of Mann et al. (1997), and to the previous studies (De Heredia et al., 2004; Filipe et al., 2020), except the study of Cotrena et al. (2017) which deleted 4 items from the questionnaire, bringing the number to 18 items, to increase its consistency. This difference can be attributed to the study's heterogeneous sample, which included both healthy subjects and those with severe depression and other psychiatric problems, both of which are known to impact decision-making. These results also help to explain why choosing an adaptive style rather than a non-adaptive one was more common in the current study. This explanation is supported by the findings of another study conducted in Sweden by Isaksson et al. (2014), which removed six items from the scale and found a good fit model with only three factors, namely, vigilance, procrastination, and back-passing, due to the heterogeneity of the sample, which included people of both sexes, at various ages, with various educations and backgrounds, as well as health and illnesses. The current study's internal consistency is higher than that of a recent study (total range=0,68-0,72) (Cardona Isaza et al.,

2021), which included only adolescents; thus, age may have an impact on DMS, but the age of participants in this research was restricted to obtain a more homogeneous sample, and this impact could not be examined. Gender was found to have a negligible effect on the results.

5. Conclusion

The aim of the current study was to gather proof of the validity of the MDMQ. Therefore, this measure can have uses in a variety of disciplines, including education, for guiding and counselling high school or university students, as well as in management discipline for assigning tasks to employees in a stressful situation, and for gaining an understanding of the candidate's completeness during recruitment. The questionnaire detects specific profiles of adaptive and maladaptive DMSs. It reveals the individuals' daily functioning through their responses that reflect their coping mechanisms under difficult situations.

In sum, The MDMQ enables the following four DMSs to be identified: vigilance, which is the optimal strategy for making decisions, in which the individuals carefully examine all possible choices, and gather sufficient information to enable them to make a good decision. Hypervigilance is the individual's tendency to make decisions in a hurry, based on the available information in order to put an end to the stress caused by the decisional situation, according to the conflict model in decision-making. Procrastination is the individual's tendency to postpone decisions to escape stress, whereas buck-passing is the propensity of the decision-maker to delegate responsibility for decisions to others in order to avoid the psychological stress that the decision would create.

Although the sample of this study is not large, compared to previous studies, the psychometric characteristics obtained make this scale a reliable tool for determining the DMS of Arabic-speaking young adults, especially students. To the best of our knowledge, this is the only available instrument in Arabic, especially in the Moroccan context that enables the assessment of these particular tendencies in decisional situations.

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