Motivational inclination in artists and business workers measured by a novel implicit tool

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Abstract

Cognitive and non-cognitive factors affect decision-making processes and result in various life outcomes such as professional success, health and happiness. These factors divide into short-term and malleable states, and stable, predictable traits. Motivation is an important factor which combines both characteristics. The main current literature distinguishes between intrinsic motivation (IM), which derives from joy, interest and personal growth, and extrinsic motivation (EM) which derives from external rewards such as financial incentives and acclamation. The motivational inclination may affect performance and commitment, and is valuable for managers, professors and other employers. Currently, the two main methods to assess the type of motivational inclination are behavioral free-choice measurements and self-report questionnaires. These methods are either cumbersome and over-specific or subjective and unreliable. Therefore, an applicable and objective measurement to distinguish the dominant motivational pattern is needed through the means of implicit assessment.

In the current dissertation I created an implicit task in which participants are introduced to scenarios depicting a character that faces a decision between two alternatives. In the first condition one option favors intrinsic motivation and the other extrinsic motivation. On the second and third conditions, the choice is between a favored and an inferior option from the same type of motivation (IM or EM, accordingly). Participants were asked to indicate their agreement with the choice made. A battery of various additional tests was administered, including an existing explicit measurement for motivational pattern. To examine this paradigm on two opposing populations a group of Artists and a group of Finance and Business workers were surveyed.

Results indicate that the implicit measure introduced in the study is in line with the standard explicit tests currently used in two out of three of the metrics used. Additionally, as hypothesized, differences between the two groups were confirmed and showed that artists showed greater tendency towards IM than EM. Age was found to be a predictor of preference towards IM over EM. Results also suggest that the current implicit tool may be viable in the future as an indicator for trait motivational inclination.

This study has some limitations. First, the participants' deliberate response on a Likert scale is not ideal and it should be substituted by a response collected via a dynamometer, as this methos would increase the implicit and objective nature of the test. Second, these data cannot be

generalized, and further research should be conducted with various populations across different countries.

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Introduction

Cognitive and non-cognitive traits and outcomes in life

Both cognitive and non-cognitive factors affect decision-making processes which add-up to future effects on life outcomes such as education, salary , health and happiness (Baker et al., 1961; Stern, 2009; Ali et al., 2009; Furman and Brewin, 1990) .

Some of these factors have a strong inherent basis, making them stable over time and resistant to change (e.g. intelligence to a greater extent and personality to a certain extent). These factors are often regarded to as *traits*, which are defined as "*characteristic patterns of thinking, feeling, and behaving that generalize across similar situations, differ systematically between individuals, and remain rather stable across time.*" (Schmitt and Blum, 2020).

Contrary to traits, *states*, which "*vary across time as a function of the situation the person encounters*" and are sensitive to environmental factors (such as mood and alertness) - are malleable, and depend on transient events and internal processes (Lieberman et al., 1986; Makeig and Jung (1995).

One interesting factor which combines both characteristics (trait and state) is motivation (Trembey et al., 1995) , which could be defined as a vector of (1) What do we want to do (vector's direction) and (2) How much would we want to do it (vector's magnitude. Botvinick and Braver, 2015).

Trait-wise, some people are inclined to be more motivated than others demonstrating differences in ambition and laziness across individuals. State-wise motivation, on the other hand, is highly affected by external and transient stimuli and events, and can demonstrate a decrease in motivation after a low grade in an exam, or a boost in motivation after a positive talk with a supervisor.

Therefore, in this sense, motivation, which holds the duality of a state and a trait altogether (Trembey et al., 1995), is an important factor which is both malleable and could lead to positive life outcomes (Baker, 2004; Turner, 2017).

Intrinsic and extrinsic motivation

In present literature, motivation is not regarded as a one single quality, but is categorized as a point on a spectrum according to its locus of origin, from intrinsic to extrinsic.

Originally, the coarse separation was between intrinsic motivation (IM), which derives from joy, interest and personal growth, and extrinsic motivation (EM) which derives from external rewards and punishments such as financial incentives, prestige and acclamation (Ryan and Deci, 2000) .

According to the prominent Self Determination Theory, motivation is set on a spectrum which spans from pure intrinsic to pure extrinsic origins (Ryan and Deci, 2000) . In their theory, six types of motivations are grouped into 3 classes: Intrinsic motivation is a class by its own, and describes pure inherent interest or satisfaction. Extrinsic motivation as a class contains (a.) Integration (b.) Identification, (c.) Introjection and (d.) External regulation. Integrated motivation is the most internalized form of extrinsic motivation and occurs when the individual completely assimilates the motivation behind the task; Identification occurs when the values behind the task are internalized by the individual (for example, when the effort exerted during the task is appreciated); Introjected regulation derives from the need to avoid guilt or gain pride which derives from self-esteem; External regulation, is the least autonomous form of motivation, and is applied by the mere need to receive an external reward or avoid a punishment. Amotivation, or the lack of motivation to do a task, is a class of its own.

Notwithstanding, some changes have been made to the model described above. Due to the high similarity between intrinsic motivation and integrated regulation and the inability to effectively distinguish between the two, integrated regulation was omitted from the popular MWMS assessment for motivation and newer models (Gagné et al., 2015; Guay et al., 2000). Moreover, Trepanier et al. (2023) recommend combining intrinsic motivation and identified regulation into one category, due to statistical overlapping.

The type of motivation one acts by (whether inclining towards intrinsic or extrinsic locus) was found to affect life outcomes such as academic performance and job performance (Baker, 2004; Turner, 2017) . Therefore, it raises the importance that employers and other authority figures in other fields (such as the academy) would be able to reveal the motivational pattern of possible candidates.

Motivation differences across groups: Artists and Business and finance workers

Besides the differences in the motivational pattern between individuals, studies found that differences exist as well between groups (Botvinick and Braver, 2015). For example, DeVoe and

Iyengar (2004) found that managers in distinct cultural regions assessed their employees differently in the perspective of their motivational pattern: North American managers assessed their workers as more extrinsically motivated, Asian managers assessed them as more holistic in their pattern (combining both EM and IM), and Latin American managers assessed their workers as more intrinsically motivated. Interestingly, but also predicted to some extent, workers of all three groups reported themselves as more intrinsically motivated.

Similarly, some evidence shows that females tend to be more extrinsically motivated than males (Boggiano et al., 1991; D'Lima and Kitsantas, 2014) among both mid-school and undergraduates.

Alongside parameters as sex and geographic culture, which are imposed on the individual and may have shaped their motivational pattern due to society norms and standards, other distinctions are a result of individual choice. Profession, for example, is one such parameter, which could reveal a more interesting relationship between life choices and motivational orientation.

In this context, people who work in art and finance may have preferences that mark two ends of the intrinsic-extrinsic spectrum.

The first reason for this assumption is that artists' work requires a great deal of originality and creativity. As artists are expected to renovate, and express their internal word to their audiences, they are required to adopt a creative mode of thought (Bryant and Throsby, 2006). Much was written on the positive relationship between intrinsic motivation and creativity, as described in the review of the topic by Steele et al. (2017) - "*Intrinsic motivation and creativity - "Opening up black box*" - where they detail the problem-solving, regulatory and production mechanisms underlying creative processes. On the other hand, people working in business and administration may need to handle more materialistic decisions in their jobs which are often grounded in quantitative thinking and rational decisions.

The second reason is that artists share a comparable socioeconomic background with people who work in the business and finance sector, and have similar access to higher education and career opportunities[1], but nonetheless, they earn approximately one third of the earning of business and finance workers (Wininger, 2016; Alper and Wassall, 2006). This supports the notion that artists

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[1] In Israel these are the data, with artists being part of a slightly better socioeconomic background.

are more intrinsically motivated than others, as they could just as easily receive higher extrinsic incentives, but repudiate these benefits.

Assessments regarding motivational patterns

Currently, the two main methods to assess the type of motivational inclination are behavioral free-choice measurements and self-report assessments (Guay et al, 2000). Self-reports, in which the subject is directly asked about the investigated feature, are prone to subjectivity and reduced self-awareness which may be problematic in the context of professional assessment, tainting the objective cause. On the other hand, free-choice measurements, in which the subject is free to occupy with a specific task for as long as she wishes – implying the amount of motivation for the given task - are costly, cumbersome and grant limited generalization. Therefore, an implicit task, which contributes objective information concerning the subject's motivational pattern without explicit declaring is needed.

The current study

In the current study, there are, hence, two main aims: (a) Create and verify an implicit tool to tap the motivational orientation, and compare it with current explicit measurements, and (b) Investigate the differences in motivation between artists and business and finance workers.

We propose an implicit task in which participants are introduced to scenarios depicting a character which faces a decision between two alternatives: one that favors intrinsic motivation and another that favors extrinsic motivation. Each scenario ends with the character choosing one of the two options. The participants are then requested to respond whether they agree or disagree with the choice the character made on a 1-10 Likert scale (completely disagree to completely agree). The implicit task contains 3 conditions and an additional control condition. The first condition reflects a choice between one option favoring EM and another favoring IM – therefore it gives information about the general tendency of the subject towards one **over** another type of motivation. To verify whether EM-IM orientation is set on one single spectrum (increase in EM demonstrates a decrease in IM) or whether the two different types are independent scales, we added conditions 2-3. Condition 2 reflects a choice between identical EM preferences (same extrinsic incentive) but different IM values (one option eliciting higher IM) while in condition 3 the opposite is true

(identical IM preferences but differences in EM). Conditions 2-3, therefore, indicate the sensitivity one feels towards changes in each type of motivation. The control condition contains scenarios with an outcome that does not differ in either EM or IM.

The study was conducted in Israel using two groups of participants: artists and people who work in the finance and administration sector.

<u>With regard to the implicit tool, we hypothesized that:</u>

A1) The inclination towards EM or IM will correspond with higher sensitivity in the favored type.

A2) Inclination **and** high sensitivity for EM or IM will be expressed in high scores in the respective type in the MWMS explicit task for motivation.

<u>Hypotheses regarding differences between groups are:</u>

B1) Artists will express an inclination towards IM over EM, and higher sensitivity for IM – compared with business and administration workers.

B2) Business and administration workers will express an inclination towards EM over IM, and higher sensitivity for EM – compared with artists.

Method

<u>Participants</u>

127 Hebrew-speaking participants took part in the experiment, divided into two groups: artists, and people working in business and administration professions. The Artists Group (AG) consisted of 66 adults (33 females; age range 24-65; mean age=35.21 years old; SD=11.7), and were working as active artists from various fields, including: visual arts, music, dance, theatre, cinema and literature. Participants from the AG group were recruited using social media (Facebook, Instagram etc.). The Business and Administration Group (BG) consisted of 61 adult participants (35 females; age range 24-52; mean age= 29.35 years old; SD=6.46), who were college students from two MA courses: (a.) Decision making course in business counselling in the College of Management Academic Studies (COLMAN) in Rishon LeZion and (b.) Marketing of Advanced Technologies course in the Holon Institute of Technology (HIT) in Holon. A Chi-squared test performed showed there were no differences between the number of participants in each group and between genders (X-squared = 0.43, df = 1, p-value = 0.51). A Wilcoxon test between the two groups (AG and BG) on age showed that there was a significant difference (W=2609, p-value 0.0039). Further analysis and solutions to this occurrence will follow in the results and discussion chapters.

In return for their participation, COLMAN and HIT students were offered 3 bonus points to their final grade in the course. All participants were offered a lecture about motivational patterns to be given by the investigator. All participants read and agreed to consent forms prior to their participation.

<u>Apparatus</u>

Consent forms and all tasks and questionnaires were administered and recorded through the Google Forms platform.

<u>Tasks and procedure</u>

The present study included 6 tests, of which 5 were standardized tests and one was created by the experimenter.

The first task was the implicit motivational task, followed by standardized tests in the following order: (1) Raven's Progressive Matrices (RPM); (2) Beck's Depression Inventory (BDI); (3) the Big-5 Inventory (BFI); (4) the Shirom-Melamed Burnout Measure (SMBM) and (5) the

Multidimensional Work Motivation Scale (MWMS). Two 5-minute breaks for refreshments were offered, one between RPM and BDI and one between BFI and SMBM.

Prior to the questionnaires, a demographic survey was administered collecting details on the age, sex, occupation, years in the profession and education of the participants.

<u>Assessments</u>
    1) <u>Implicit motivational pattern task (IMPT)</u>

In this task, vignettes describing a character's action were presented, and participants were requested to state the extent in which they agree with the character's choice.

The task included 4 conditions:

In the **first condition (EM-IM)**, the character decided between one option that favors Intrinsic behavior (IM; e.g., doing something that is fun or joyful) and another that favors Extrinsic behavior (EM; e.g., doing something that is rewarding economically or socially). An example would be choosing between an interesting job that pays a low salary or a boring higher-paying job. In this condition there were 10 scenarios, each divided in two, based on the character's decision, totaling 20 stimuli.

In the **second condition (IM-IM)**, the character decided between two options that were equally rewarding extrinsically but one option (IM+) was more rewarding intrinsically than the other (IM-; e.g., between two equally paying jobs, while one is more fun than the other). In this condition there were 5 scenarios, each divided in two, based on the character's decision, totaling 10 stimuli.

In the **third condition (EM-EM)**, the character decided between two options that were equally rewarding intrinsically but one option (EM+) was more rewarding extrinsically than the other (EM-; e.g., a choice between two equally interesting jobs, while one pays a higher salary than the other). In this condition there were 5 scenarios, each divided in two, based on the character's decision, totaling 10 stimuli.

In the **fourth condition (Control)**, the character was doing an action regardless of the information that was presented in the situation, not opting for either extrinsically or intrinsically inclined behavior. An example would be a person that is hungry and receives a spam message, while eating an egg with a salad. In this condition there were 10 stimuli, one for each scenario.

Examples of the English versions of some of the stimuli are presented in **Appendix 1.**

As stated in the first 3 conditions, each scenario had two different endings, one for each choice of the character (EM or IM in condition 1; IM+ or IM- in condition 2; EM+ or EM- in condition 3).

To increase identification with the character's behavior, separate male and female versions were created and administered for male and female participants, correspondingly. In each version, both names and actions were in the same sex as of the participant. Whenever possible, gender-neutral names were used.

In conditions 1-3, each participant was presented with only one stimulus for every scenario (e.g. in condition 2: IM+ **or** IM-). For each stimulus, participants were asked to state their degree of agreement with the character's behavior on a 1-10 Likert scale (1= Do not agree at all; 10= Strongly agree). To control for the questions presented, two complementary versions were created. The order of different stimuli was set randomly beforehand and was fixed, and can be found in **Appendix 2**. Thus, there were 4 versions of the task: Female-1, Female-2, Male-1, and Male-2. Participants were assigned to version 1 or 2 based on the parity of the last digit of their ID number (ID numbers ending with 1,3,5,7,9 completed version 1; ID numbers ending 2,4,6,8,0 completed version 2).

Data preparation

To prepare the data for analysis, three parameters were created based on the subjects' responses. The first, intrinsic/extrinsic inclination, was created based on condition 1, and was calculated by the deduction of the scores on stimuli that describing intrinsically motivated behavior from the scores of stimuli describing extrinsically motivated behavior. The scale spans from +10 to -10, with 10 demonstrating strong inclination towards EM behavior, and -10 demonstrating strong inclination towards IM behavior. The second parameter, Sensitivity to Intrinsic Differences, was extracted from condition 2, and was calculated by deducting the scores given in stimuli that described a choice of lower intrinsic rewards from scores on stimuli that favored higher intrinsic rewards. Likewise, the third parameter, Sensitivity to Extrinsic Differences, was extracted from condition 3, and was calculated by deducting the scores given in stimuli that described a choice that of lower extrinsic rewards from scores on stimuli that favored higher extrinsic rewards. Higher scores on these two parameters indicated stronger sensitivity to the corresponding motivational domain.

2) Raven's Progressive Matrices (RPM): In the study, a reduced nine-item form of Raven's Standard Progressive Matrices was used. Each score from the abbreviated nine-item scale

was transformed to its matching score on the full 60-item scale applying the formula reported by Bilker et al. (2012).

3) <u>Beck's Depression Inventory (BDI):</u> The Hebrew version of the 21-item assessment was used (Lepkifker et al., 1988). Each item holds 4 phrases representing different levels of a trait related to depression, with 0 indicating the lowest level of the attribute, and 3 the highest. The sum of the scores of all items constitutes the final value on a 0-63 scale.

4) <u>Big Five Inventory (BFI):</u> All 5 attributes of the Big-5 inventory were assessed by their relative items of the BFI in the Hebrew language (Etzion and Lanski, 1998; compatible with the English version of John et al., 1991). The questionnaire consists of 44 items evaluating the traits of the Five-Factor model (agreeableness, conscientiousness, extraversion, neuroticism and openness). Participants are required to rate their agreement with each statement on a five-point Likert scale, with 1 indicating "Strongly disagree" and 5 "Strongly agree.". The mean score for each trait was calculated per participant.

5) <u>The Shirom-Melamed Burnout Measure (SMBM):</u> The Hebrew version of the 14-item assessment was used (Shirom and Melamed, 2006). Each item represents a phrase related to burnout feelings in work. Participants are required to respond how often they experienced the feeling described in the passing month, on a 1-7 Likert scale (1=Almost never; 7=Almost always). A mean score was calculated for each participant.

6) <u>The Multidimensional Work Motivation Scale (MWMS):</u> The Hebrew version of the 19-item assessment was used (Gagné et al., 2015). In this scale, each item represents a phrase related to one of the different motivational domains: External regulation, introjection, identified motivation, intrinsic motivation and amotivation. Participants are asked to state the extent each proposition describes the reasons for making an effort in their jobs. In accordance with Trépanier et al. (2023), only a 4-factor analysis of the scores was computed, merging the identified and intrinsic motivational items. Average scores were calculated for the following parameters: external regulation, introjection, intrinsic and identified (combined) and amotivation.

Results

<u>Preprocessing:</u>

Scores for RPM, BDI, BFI, SMBM and MWMS assessments were calculated as reported in the Methods section.

Average scores in the implicit motivation task were calculated for each of the four conditions: EM-IM, IM sensitivity, EM sensitivity and control. Conditions EM-IM and EM sensitivity were separated into trials containing financial incentives (e.g. salary and bonuses) and social incentives (e.g. prestige and acceptance). Respectively, new parameters called EM-IM-f and EM-EM-f, or EM-IM-s, and EM-EM-s were created.

<u>Data analysis</u>

Data analysis was conducted using R language version 4.1.3 (2022-03-10).

Descriptive statistics are reported in Table 1. Generally, scores were higher for IM sensitivity and were inclined towards IM in the EM-IM measurements. In conditions 2-3, average scores indicated that participants preferred the better option out of the two. Participants in AG were older on average than in BG, as mentioned. This point will be further discussed.

Group	N	Age (mean)	Average EM-IM	SD of EM-IM	Average IM sensitivity	SD of IM sensitivity	Average EM sensitivity	SD of EM sensitivity
Art	**66**	**35.21**	**-1.35**	**0.96**	**3.36**	**6.11**	**1.49**	**6.68**
female	33	35.03	-1.35	0.83	3.29	6.13	1.31	6.64
male	33	35.39	-1.35	1.08	3.44	6.09	1.67	6.73
Finance	**61**	**29.35**	**-0.74**	**1.06**	**2.85**	**6.18**	**1.79**	**6.42**
female	35	27.67	-0.86	0.97	3.17	6.13	1.82	6.38
male	26	31.62	-0.57	1.17	2.43	6.24	1.74	6.48
Grand Total	**127**	**32.40**	**-1.06**	**1.05**	**3.12**	**6.14**	**1.63**	**6.56**

Table 1. Descriptive statistics.

<u>Correlations</u>

EM-IM was found to be negatively correlated with IM sensitivity (R^2 = -0.376, p<0.0001) indicating inclination towards IM over EM but was not significantly correlated with EM sensitivity (R^2 = 0.049, p=0.59). This is in line with hypothesis A1. Interestingly, IM sensitivity was positively correlated with EM sensitivity (R^2 = 0.344, p<0.0001) which may raise the notion that sensitivity to differences in incentives could be a trait of its own. For data, see Figure 1. The control condition was not significantly correlated with any of the three main metrics. Age was found to be negatively correlated with EM-IM (R^2 = -.27, p<0.005), indicating an inclination towards IM over EM, and positively correlated with IM sensitivity (R^2 = 0.176, p<0.05).
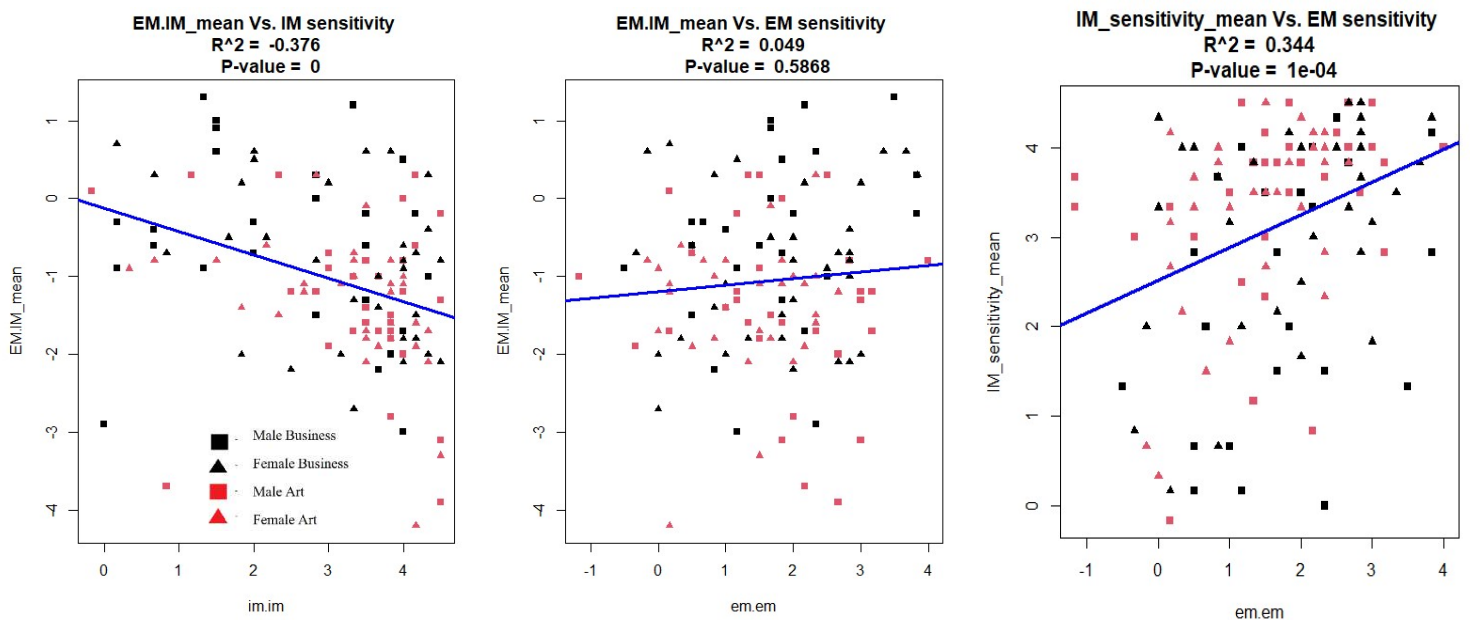

Figure 1. Correlations between the 3 implicit metrics: EM-IM, IM sensitivity and EM sensitivity

Differences between Groups in EM-IM, IM sensitivity and EM sensitivity

To assess the differences between the two groups I conducted a series of T-tests. Regarding our three metrics, we found that AG scored lower than BG in EM-IM, indicating that artists tend to be more intrinsically motivated (T-score = -3.39, P-value < 0.001). Furthermore, AG scored higher than BG in IM sensitivity (T-score = 2.4, P-value = 0.018), in line with Hypothesis B1. However, I failed to find a significant effect in EM sensitivity (T-score = -1.54, P-value = 0.12). Notwithstanding, when I split EM trials into trials that involve financial incentives (e.g., higher salary) and trials that involve social incentives (e.g., prestige and social acceptance), both groups were influenced similarly by changes in financial incentives (T-score = 1.16, P-value = 0.25), but artists turned out to be significantly less sensitive to EM differences when social incentives were at hand (T-score = 2, P-value < 0.05). A similar effect was found in the EM-IM condition as the differences in EM-IM were preserved while comparing the EM-IM-s trials (T-score = -3.37, P-value = 0.001) but not when comparing the EM-IM-f trials (T-score = -0.26, P-value = 0.79).

This means that when financial incentives are offered, AG and BG achieve similar responses whereas when social incentives are offered differences are revealed (See Figures 2-4).
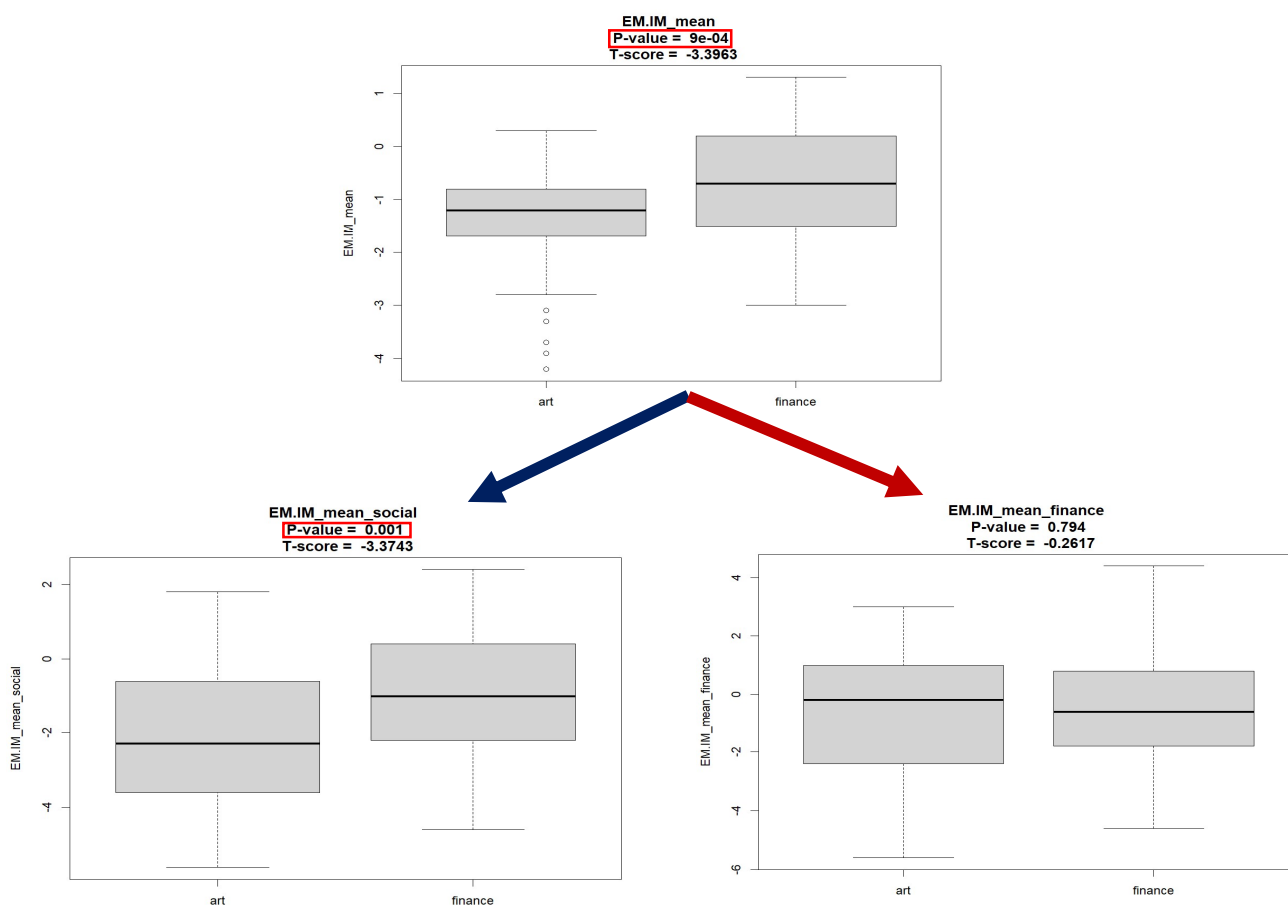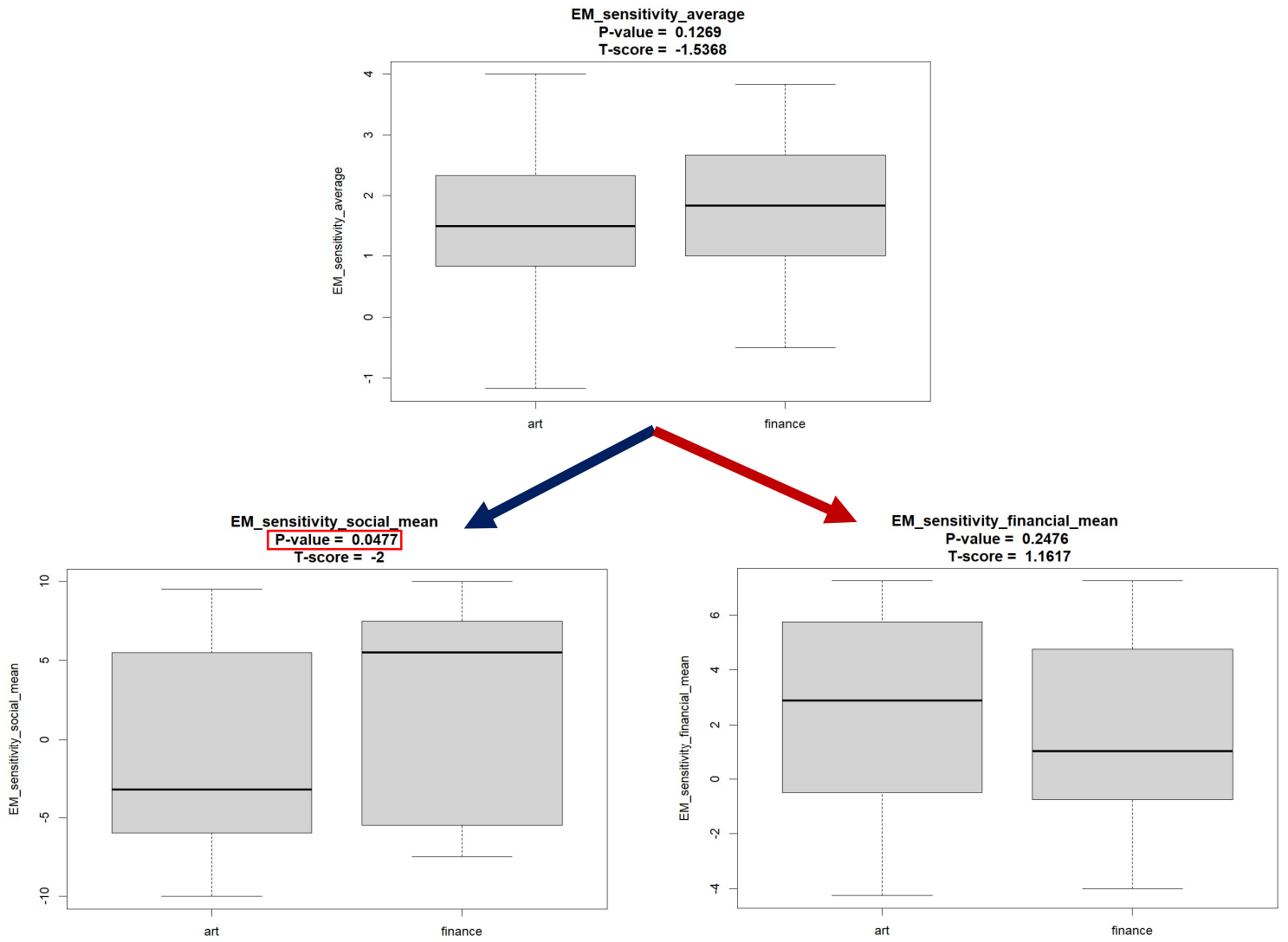

Figure 2. EM-IM inclination across groups.

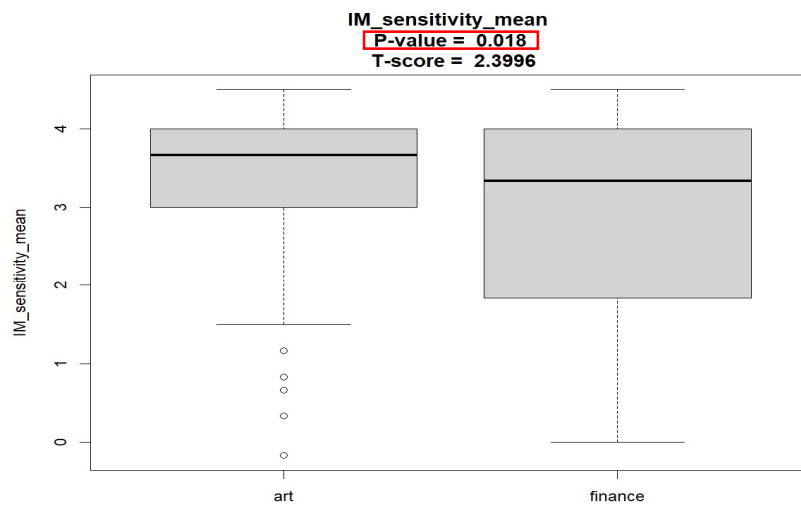*Figure 3. EM sensitivity across groups.*

Figure 4. IM sensitivity across groups.

The effect of age over IM and EM

As mentioned before, the mean age differed between AG and BG. To assess the differences between the groups after eliminating age differences, I downsampled the two groups so that they will contain similar age distributions. This was achieved by creating 6 age clusters of 5 years span each (20-25, 25-30 etc.) up to the age of 45. In order to assemble two random distributions which were comparable for age, in each cluster the minimum number of participants from both groups was chosen, and this number of participants was randomized from each group. After establishing that there was no age difference, a general linear model was performed, with age, sex and group as factors and found that there were sizable group differences in EM-IM and a non-significant effect for IM. Interestingly, IM sensitivity was not predicted by the group, but instead by sex, with males being more sensitive to EM than females (see Tables 2-4 for further information).

	Coefficients Estimate	Std. Error	T value	P-value
(Intercept)	0.18816	0.59471	0.316	0.75228
age	-0.03347	0.02092	-1.6	0.11241
Male-Female	0.28109	0.18102	1.553	0.12325
Art-Business	-0.56993	0.17686	-3.223	**0.00166****

*Table 2. **EM-IM** General linear model including age, sex and group, after adjustments for age.*

	Coefficients Estimate	Std. Error	T value	P-value
(Intercept)	3.17348	0.74056	4.285	3.83E-05**
age	-0.01114	0.02605	-0.428	0.67
Male-Female	-0.07035	0.22542	-0.312	0.756
Art-Business	0.37778	0.22023	1.715	*0.089*

Table 3. **IM sensitivity** *General linear model including age, sex and group, after adjustments for age.*

	Coefficients Estimate	Std. Error	T value	P-value
(Intercept)	2.06638	0.643	3.214	0.0017
age	-0.01589	0.02262	-0.703	0.4838
Male-Female	0.43262	0.19572	2.21	**0.0291 ***
Art-Business	-0.26999	0.19122	-1.412	0.1607

Table 4. **EM sensitivity** *General linear model including age, sex and group, after adjustments for age.*

To further understand the effect of age over the type of motivation and its pattern within the group, each group was divided according to its median age, and conducted a T-test on each parameter (EM-IM, IM, EM) between the older half and the younger half of each group. Only IM sensitivity within artists was found to be dependent on age (t= 2.2495, p-value = 0.028), with older adults showing more IM sensitivity. EM-IM and EM sensitivity were similar between the two age groups, both among artists and among business and administration workers.

<u>IM and EM inclination</u>

A T-test revealed a general tendency across all participants to rate higher scores on IM than on EM (t = 10.264, p-value < 1e-16), which also manifested in an average score of -1.06 in the EM-IM parameter (instead of 0 for complete balance), demonstrating a slight tendency towards IM over EM.

<u>Current task compared with the MWMS implicit scale</u>

With regard to current explicit MWMS tool, external regulation was found to be positively correlated with EM-IM (R^2 = -.28, p<0.005), indicating inclination towards EM over IM. It was also positively correlated with EM sensitivity (R^2 = 0.2, p=0.022) and showed a negative borderline

correlation with IM- sensitivity (R^2 = -.156, p= 0.079). These results are in line with Hypothesis A2.

MWMS Intrinsic-Identified is negatively correlated with EM-IM (R^2 = -.23, p<0.01), indicating inclination towards IM over EM. It was also negatively correlated with EM sensitivity (R^2 = -.344, p<0.0001). Notwithstanding, it showed no correlation with IM sensitivity. These results are in line with Hypothesis A2, although a positive correlation with IM sensitivity was expected.

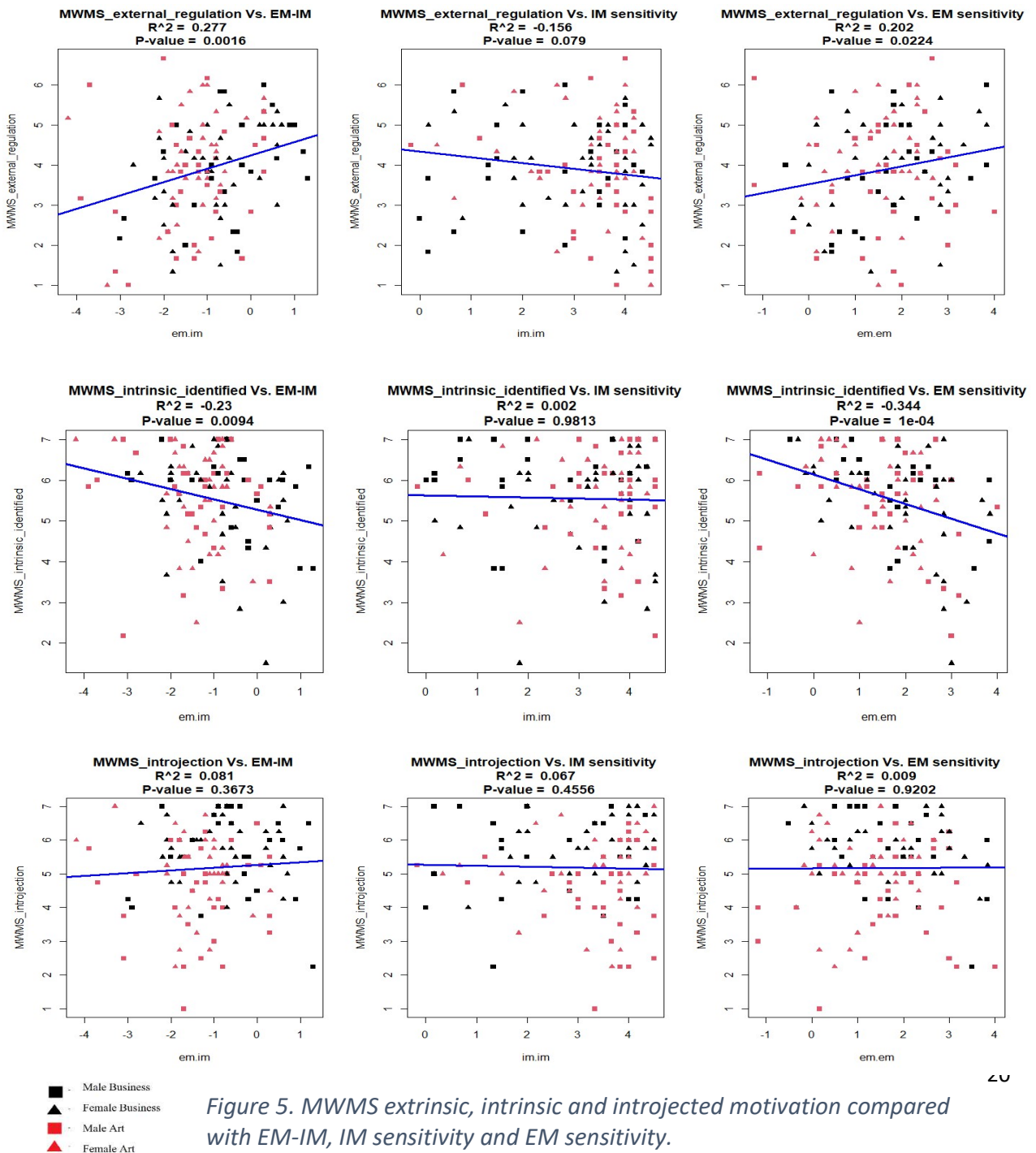MWMS Amotivation and Introjection were not correlated with either one of the three metrics.

Figure 5. MWMS extrinsic, intrinsic and introjected motivation compared with EM-IM, IM sensitivity and EM sensitivity.

Interestingly, although the implicit task revealed that AG was more inclined towards EM over IM, in the MWMS comparisons between the groups, neither MWMS extrinsic (T-score = 0.5, P-value = 0.61) nor MWMS intrinsic (T-score =0.057, P-value = 0.95) showed differences between AG and BG. Interestingly, MWMS Introjection, which did not correlate with any of the implicit measurements, was significant (T-score = -4.83, P-value < 0.001).
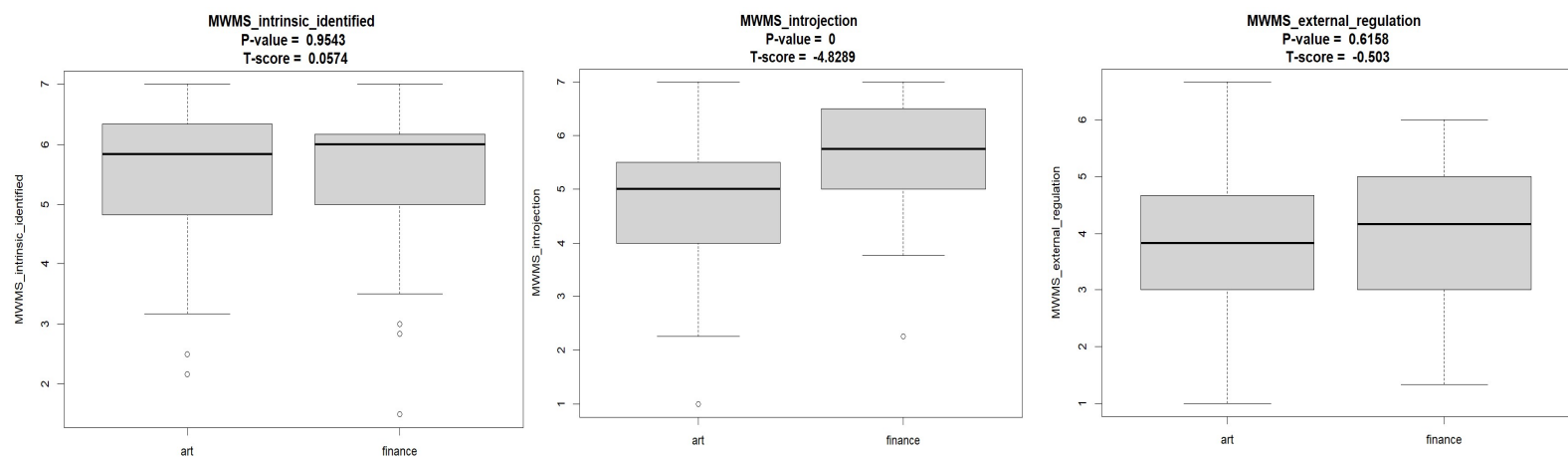

Figure 6. T-test comparisons between AG and BG for MWMS intrinsic, introjection and external regulation.

To compare our assessment's predictions with the existing explicit task, we conducted a GLM for MWMS Intrinsic and MWMS Extrinsic (after conducting the age adjustments beforementioned). We found that MWMS Intrinsic showed no differences depending on either age, sex or group and that MWMS Extrinsic preserved an effect for age.

	Coefficients Estimate	Std. Error	T value	P-value
(Intercept)	5.78372	0.73372	7.883	2.10E-12
age	-0.06206	0.02581	-2.404	**0.0178***
Male-Female	0.03434	0.22334	0.154	0.8781
Artist-Business	0.09028	0.2182	0.414	0.6798

*Table 5. **MWMS extrinsic** General linear model including age, sex and group, after adjustments for age.*

	Coefficients Estimate	Std. Error	T value	P-value
(Intercept)	4.92076	0.75687	6.501	2.19E-09
age	0.02112	0.02663	0.793	0.429
Male-Female	0.02433	0.23039	0.106	0.916
Artist-Business	-0.20859	0.22508	-0.927	0.356

*Table 6. **MWMS extrinsic** General linear model including age, sex and group, after adjustments for age.*

Exploratory analysis and miscellaneous

Out of the Big-5 personality traits, openness had the most interesting behavior, negatively correlating with EM-IM (R^2 = -0.355, p<0.0001) indicating an inclination towards IM over EM and showing a positive borderline correlation with IM sensitivity (R^2 = 0.174, p=0.0508) and a negative borderline correlation with EM sensitivity (R^2 = -0.157, p=0.078).

Intelligence was found to be negatively correlated with EM-IM (R^2 = -0.23, p<0.01 indicating inclination towards IM over EM and positively correlated with IM sensitivity (R^2 = 0.21, p<0.05).
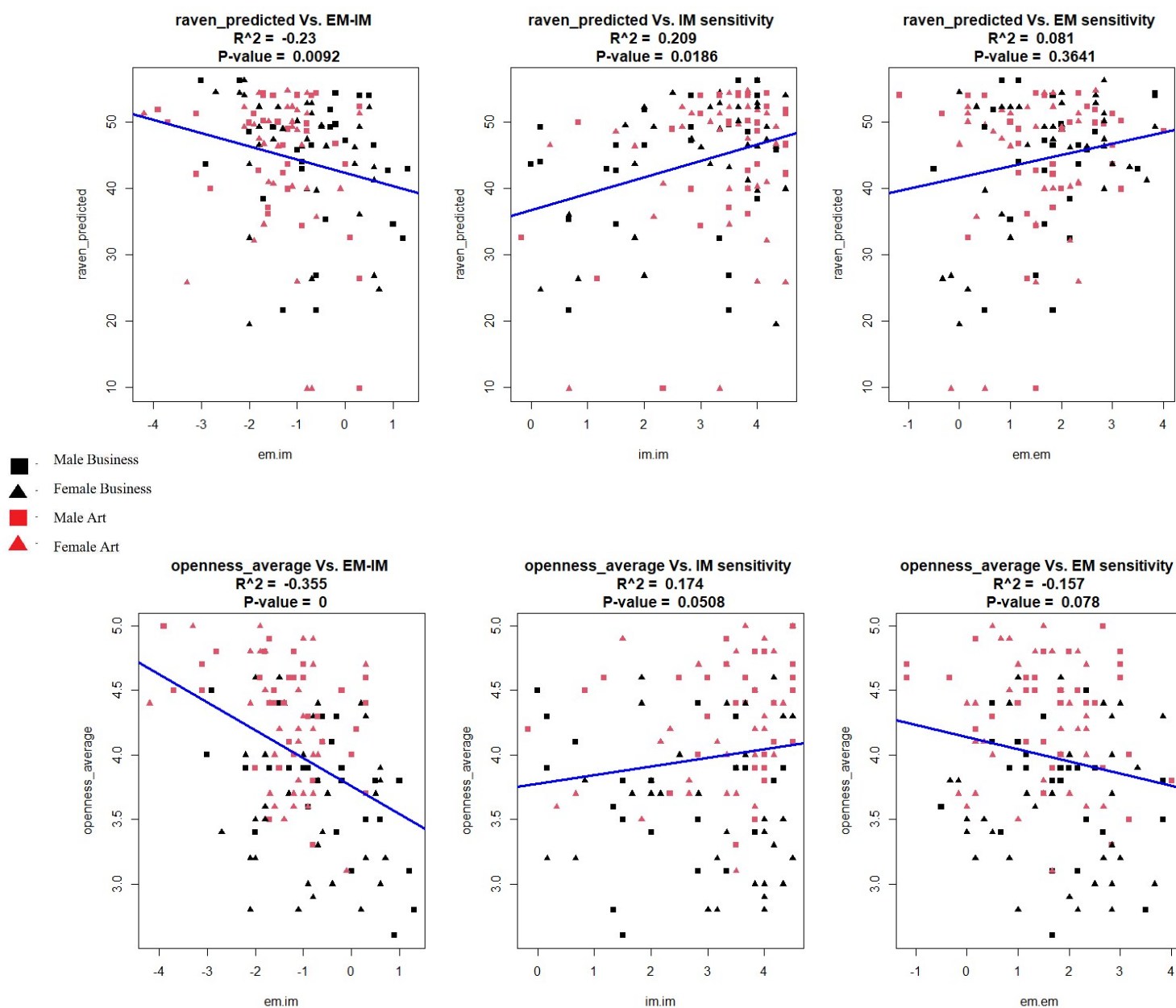

Figure 7. Predicted Raven scores for IQ and Big-5 Openness component correlates with EM-IM, IM sensitivity and EM sensitivity.

Regarding the personality indicators and depression scales, group comparisons showed that artists scored higher in the BDI depression scale (T-score =4.07, P-value < 0.0001), were more neurotic (T-score =3.22, P-value < 0.005), more open (T-score = 6.97, P-value < 0.0001), less agreeable (T-score = -2.58, P-value = 0.011), and less conscientious (T-score =-6.64, P-value < 0.0001).
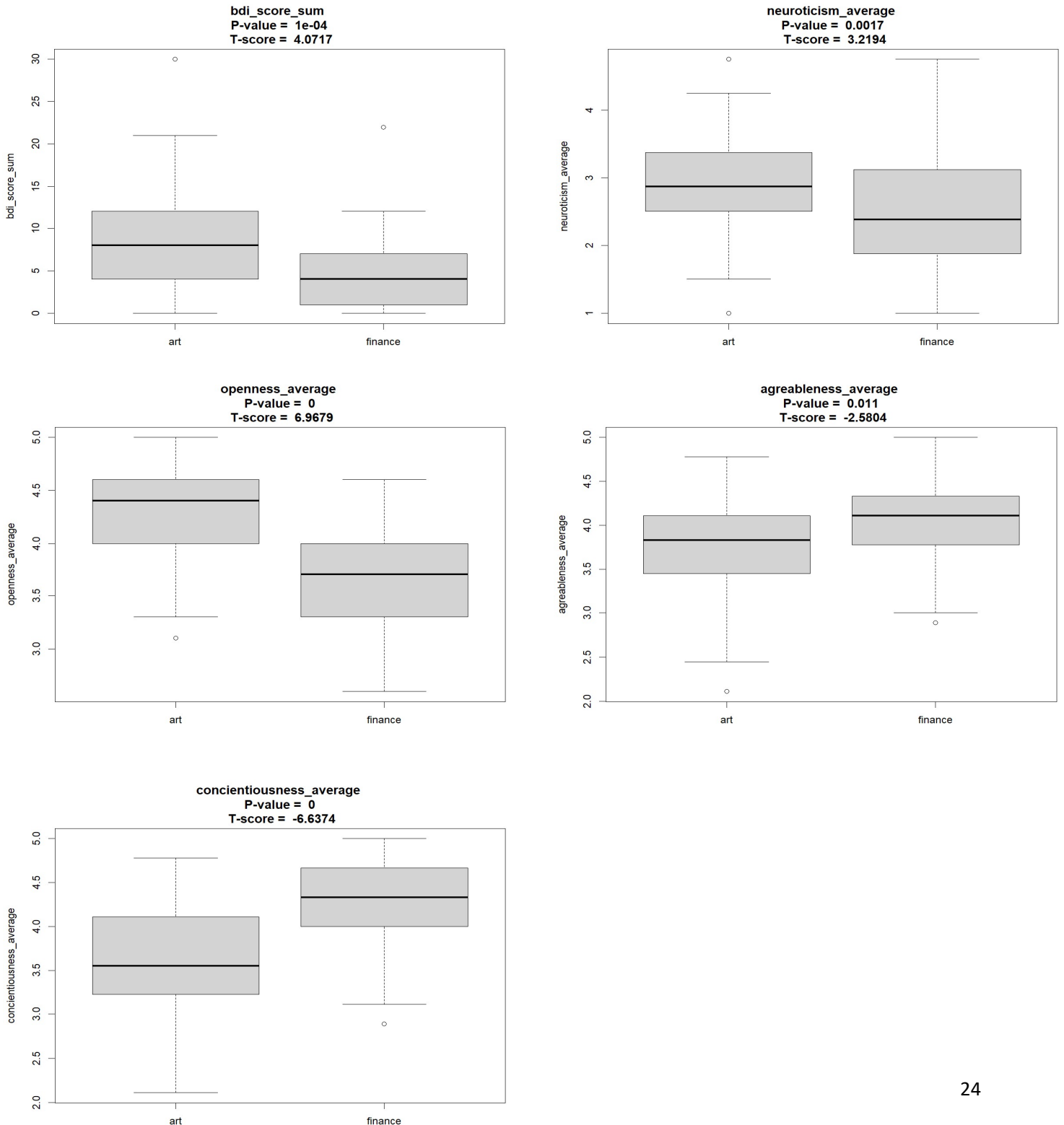
Figure 10. Comparisons between AG and BG for BFI and BDI scores.

Discussion

The main two goals of the current study were to (A) investigate the capabilities and limitations of a novel implicit measurement for assessing motivational patterns, and (B) study these patterns among artists and business and administration workers. In this section I will discuss the results in response to both preliminary questions, and I will finish off by detailing limitations and future directions.

Establishment of an implicit tool recognizing motivational inclination

The results in my study generally supported Hypotheses A1 and A2. This is necessary in order to establish that my implicit tool assesses individual motivational patterns. Hypothesis A1 was partially confirmed as IM sensitivity indicated a higher tendency for IM over EM (by expressing a negative correlation with EM-IM). However, EM did not show the same effect with a tendency towards EM over IM. This raises the possibility that the *acknowledgment* that one option is better than another does not necessarily predict the *preference* of the agent witnessing the choice. This is, in fact, a case of Pareto improvement and Pareto optimality, in which two options are comparable in all criteria, except one criterion which is better in one of the two options – making it a clear choice. In the EM sensitivity trials, intrinsic incentives were identical, but in one option the extrinsic incentive was clearly better than in the other. Perhaps, the ability to distinguish a clear extrinsic advantage does not result in the preference of this advantage when a tradeoff between EM and IM exists, while the sensitivity of differences in intrinsic motivators does result in such a preference. This can be backed up by the fact that IQ (measured by RPM) was correlated with higher IM sensitivity and IM preference but not with higher EM sensitivity, meaning that sensitivity to IM requires more resources that could affect decisions which contain a tradeoff, unlike sensitivity to EM changes.

Additionally, sensitivity to EM was positively correlated with sensitivity to IM, suggesting that the two do not compete on a zero-sum scale, or that an increase in EM will result in a decrease in IM (and vice versa). Perhaps, alongside the fact that there was no ceiling effect for either EM or IM sensitivity, the actions of noticing and reacting to differences in rewards are comprised of an *ability* component and a *preference* component.

As expected, the control condition did not correlate with any of the other conditions, and was similar across groups supports. This shows that the differences between groups in the other conditions and the trends they indicated was due to different scenario choices.

In the literature, the interrelation between IM and EM is usually discussed within the state dimension, for instance, with regard to the interaction of intrinsic and extrinsic incentives in the execution of a given task and how it affects persistency and performance (Fishbach and Woolley, 2022). In this context, we can consider the over-justification effect which shows that people lose their drive to do a task when there is an overflow of reasons to do it (Maimaran and Fishbach, 2014; Gneezy and Rustichini, 2000), or the phenomenon that extrinsic incentives may crowd out intrinsic motivation for a specific task (Gneezy et al., 2011). With the task I employed in my study I attempted to find the interactions between EM and IM in the trait dimension.

Concerning Hypothesis A2, we compared the implicit task currently offered to the existing explicit MWMS assessment. We found that our task, in two out of three conditions, was successfully predictive of the MWMS-Extrinsic and Intrinsic scores. EM preference predicted high MWMS-Extrinsic scores, and IM preference predicted high MWMS-Intrinsic scores – meaning that condition EM-IM could serve as a future implicit tool for assessing motivational patterns. Moreover, EM sensitivity predicted high MWMS-Extrinsic scores and low MWMS-Intrinsic scores. This supports the aforementioned postulate that sensitivity to EM or IM, as measured in conditions 2 and 3, contains a preferential component.

IM sensitivity did not correlate with either MWMS-Intrinsic (positively) or MWMS-Extrinsic (negatively).

As mentioned, IM sensitivity predicted preference for IM over EM, but EM sensitivity did not predict preference for EM over IM. The trend we see with regard to the MWMS is the opposite, where EM sensitivity is related to the extrinsic preference in MWMS, but IM does not. One careful possibility in this case may be that the tangible EM translates more fluently to an explicit task, whereas the abstract IM translates better to the implicit task. This point should be investigated more thoroughly in future experiments.

Group differences and motivational patterns

Hypothesis B1 was confirmed as artists did present a greater tendency towards IM, and were more sensitive to IM than business and administration workers. The results in the implicit task support the claim that artists are more intrinsically motivated than others, and sheds light on a new notion in which artists are also more sensitive to differences in intrinsic motivators, which was not mentioned, as far as I know, in the literature. Hypothesis B2, on the other hand, was not entirely confirmed. Although participants in BG showed less tendency towards IM than EM than artists, on average they were more sensitive to IM differences than EM differences as a group. This is part of a greater effect which was persistent throughout the whole cohort, where scores for IM sensitivity were higher than those for EM sensitivity. Moreover, the average EM-IM score across all participants was inclined (even though subtly) towards IM preference. Another proof that there was a general tendency for IM over EM across groups is that the average scores for MWMS-Intrinsic were higher than those in MWMS-Extrinsic. It is known that in job-related and other social situations people have an incentive to stress out their intrinsic motivation (Woolley and Fishbach, 2018). This may urge them to declare that they are more intrinsically inclined rather than extrinsically. However, the interesting point in the current study is that this effect also appeared in the implicit task. One possible explanation would be that people are generally more intrinsically motivated, and support intrinsic behavior even when they witness it as part of a choice made by a third-party agent.

Although overall sensitivity to extrinsic motivators was similar across groups, differences emerged when I separated the trials into those that rely on financial incentives (e.g., higher Vs. lower salary) and those that rely on social incentives (e.g., higher Vs. lower social acceptance and prestige). We found that in the trials that were based on social differences, business and administration workers now scored higher than artists (and showed an absolute support for high social incentives). On the other hand, artists showed absolute resentment towards social incentives, even when all other parameters were the same (meaning that when two almost-identical options were presented, they preferred the one that *discourages* social acceptance and prestige). On trials relying on financial incentives, there were no differences across the groups, and participants absolutely preferred the higher paying options.

The effect that emphasized the differences between social and financial extrinsic trials was also demonstrated in the preference between the two kinds of motivation when splitting EM-IM trials according to this separation. We found that the differences between the two groups in their

motivational preference were rooted in differences in the social trials. Artists were significantly more inclined to prefer intrinsic incentives when those competed against extrinsic social incentives, while they were divided in their responses when financial incentives competed with intrinsic incentives. In trials relying on financial incentives, AG and BG responses were identical.

Interestingly, the MWMS assessment did not tap for differences between AG and BG in both its Intrinsic and Extrinsic measures. Unexpectedly, in the Introjection measure differences were found. This metric contains different reasons for working, such as: "Because it makes me feel proud of myself", "Because I have to prove to myself that I can" and "Because otherwise I will feel ashamed of myself". These items are related to the perception of self-esteem for executing or not executing a task. The surveying of relevant literature showed contradicting results relevant to the relations between self-esteem and the Big-5 Inventory (Marshall et al., 2015; Erdle et al., 2009). Since many experiments relating to motivational patterns do not refer to MWMS-Introjection deliberately, there may be lack of data as to how to interpret these results.

Personality, intelligence and motivational patterns

Concerning my results related to the Big-5 Inventory, they were in line with existing literature. For example, Jirásek and Sudzina (2020) reported a positive correlation between creativity and Big-5 Inventory component of openness, and a negative correlation between creativity and conscientiousness. In my study I achieved similar results, only when artists were considered as a group but not with creativity as a factor. On the same page, openness and inclination towards IM over EM were found to be positively correlated. Regarding personality, I found that the two most prominent differences between AG and BG were openness (with artists being more open) and conscientiousness (with artists being less conscientious). Perhaps creativity, which is one of the characteristics most identified with artists, served as a mediator in my study for these effects. The notion that creativity could mediate artists' Big-5 personality traits could be assessed in future experiments adding creativity measurements to the study. Openness and

Additionally, intelligence (measured by Raven matrices) was found to positively correlate with IM sensitivity and IM tendency but not with EM sensitivity. This is in line with previous research that showed that IM is positive correlation IQ (e.g., Gottfried, 1990; Gottfried, 2011).

Limitations and future directions

Age and motivational pattern

As the first cohort of the artists was older on average than the group of business and administration workers, in order to mitigate this effect, I later added to the sample younger artist participants. However, since the minimum age was 24 years old (to be sure that people persisted in a given career for a couple of years), we were not able to neutralize this effect completely, and some age differences endured. Additionally, in line with previous literature, we witnessed a positive correlation between age and intrinsic motivation from a certain age (Kordbacheh et al., 2014)

Previous literature suggests a non-linear relationship between age and IM. It is presumed that IM decreases throughout school, until it reaches a minimum in early adulthood and then increases throughout life gradually (Digelidis and Papaioannou, 1999; Inceoglu, et al., 2012). Similarly, in my study I observed a positive correlation between age and IM sensitivity and tendency for IM over EM. Since my youngest participants were 24 years old, one can assume that the increase in this case would be linear. This effect could be explained by various reasons. One possible reason is that as people age, they gain more financial and social confidence and therefore they are less affected by extrinsic incentives. Another reason which could be relevant specifically to the cohort of older artists as being more intrinsically motivated would be a "survival effect" in the art world. Since the art world is not as rewarding as other professions, it may be that people who persisted in a career in art did so out of inherent passion despite the ungratifying conditions, thus exhibiting higher IM scores.

However, to verify whether differences between the two groups persisted if they were comparable in their age distribution, I randomly sampled participants from each group for each 5-year window ranging the ages of 20-45, according to the minimum of the two groups in the given window. GLM analysis of the data (with group, age and sex as factors) showed that the groups differed in their motivational inclination between one another – with artists preferring IM over EM significantly more than others. The age effect was eliminated as age no longer explained changes in either EM-IM, or sensitivity for either EM or IM. An interesting result that emerged from the GLM was that a gender effect was found for EM sensitivity, as males were more sensitive to differences than females. Sex and gender differences are discussed in the literature both in motivation for involvement in physical activity an in cognitive tasks such as reading. Results in this matter are mixed. Egli et al. (2011) stated that they found that males show greater tendency for intrinsic incentives in performing physical activity while females showed a greater tendency for extrinsic

incentives. In their study, males mention that enjoyment and challenge were more important for them than women and were less affected by weigh management and appearance than women. Notwithstanding, also competition and social recognition was more important for males as motivators for engaging in physical activity. Therefore, under a closer look and analysis according to the Self Determination Theory, these results may be debated and provide a more complex picture. López-Fernández et al. (2014) did not find any differences in motivational profiles between males and females among Triathletes. This should be compared with McGeown et al. (2012) which found that females were found to be more intrinsically motivated in reading than males. However, it was mentioned that these differences in sex were small and were mostly accounted for higher female scores in efficacy and involvement. The intricate, though interesting differences in motivational patterns in both sex and gender should be further investigated in future research.

Another limitation is that I did not distinguish the artists' group into sub-groups of art fields, such as dance, painting and music. Since these fields are different in their exposure audience, business and financial models, physical involvement and required originality, this may affect the personality and motivational patterns of the participants. Therefore, in a future study, it would be preferred to survey large-enough groups from each art field and make comparisons between them.

Additionally, to reveal whether the participants were indeed more intrinsically motivated, and not responding in this manner due to the confounds of explicit surveying, I wish to further develop the task using a more implicit method. This could be done by using dynamometer responses to measure support or dissatisfaction with the characters' choice. Since dynamometer responses do not require deliberate use of language and explicit cognitive channels, and are not as conscious as Likert-scale responses, they may produce more objective data that will shed light on the true nature of motivational patterns (Terenzi et al., 2018).

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