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WAR FOR TALENTS MEETS FACIAL EXPRESSION – leveraging recruiting videos in professional service firms

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Abstract

War for talents is a pressing issue in HR management. In Germany the unemployment rate has been falling continuously, society is ageing, and senior employees have not the relevant skills on future topics like big data, programming and the like. The Corona crisis and its diminishing impact on the economy will still not alter the fact, that experts are highly sough after. Millennials, however, are searching for meaningfulness. At the Neuromarketing Competence Center at Aalen University, we conduct research on the subject of recruiting videos from the audit companies and management consultancies PwC and KPMG. In this study, we want to find out, how the impact of videos works in an objective way. So instead of just asking the participants about their opinion of the videos and the company behind it via a traditional web-survey, we also use facial expression to get an unfiltered emotional analysis of the impact of the videos via eye-movement, but also via face-muscle activity (through the software of NViso with a remote webcam recording). Thus, the study results are implicit, not explicit. The study is carried out with 103 participants in the first survey and 32 participants in the facial expression part. These participants are mainly students who will soon start their professional career. Despite obvious differences in quality and scenes shown in the videos, the emotions felt by the participants are similar. Especially the feelings of happiness, surprise and fear occur. A direct personal approach, positive statements and positive scenes are well received.

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1. Introduction

One of the major topics in HR management is the war for talents, which originates in a statement by McKinsey from 1998, but gets further traction by the current shortage of skilled workers [1].

War for talent is a matter of two things: On one hand, the unemployment rate has been falling continuously since 2005 and has only been interrupted by the economic and financial crisis in 2008/2009 [2]. On the other hand, society in Germany is ageing [3]. In addition, senior employees have less skill on future topics like data science, predictive analysis and machine learning, which increases the necessity to capitalize on the stock of young talent. A stock that, due to demographics, gets increasingly smaller and thus also gets more demanding.

The stock of young talent is also very mobile. A Statista-study showed that more than two thirds of the full-time employed Germans surveyed are not in principle averse to working abroad [4]. As a result, progressive globalization also has an impact on talent management, exacerbating the challenges already identified in the war for talents. The greater the competition on the employer side, the more attractive the company must be to talent [1].

Digitalization has also arrived in the battle for the best talents. For example, 95.4 % of the 1000 largest companies in Germany in terms of revenue said, that they use their company website as a recruiting channel [5]. This finding matches with analysis in job searching: More than one in three are searching for a suitable job and employer on their corporate websites [5]. Furthermore, future employees not only expect a solid corporate website, but also a convincing social media strategy and a first look inside the company, for example in the form of videos.

The points mentioned are reasons why companies should cultivate an all-embracing, optimized external appearance in the war for talents - also in the area of encouraging applicants through recruiting videos. In the neuromarketing study "Emotion-Induced Engagement in Internet Video Advertisements" from 2012, they "shows how advertisers can leverage emotion and attention to engage consumers in watching Internet video advertisements. In a controlled experiment, the authors assessed joy and surprise through automated facial expression detection for a sample of advertisements." [6] We think about how recruiters can engage potential personnel via internet videos.

At the Neuromarketing Competence Center at Aalen University, we conduct research on the subject of recruiting videos from audit companies and management consultancies. The companies chosen, two of the big four auditing and consulting giants PwC and KPMG, have experienced high growth and are in high need of talent. Talents especially coveted are the above mentioned data scientists and machine learning experts, which are also sought after by "cool" startups and Silicon Valley firms. Both PwC and KPMG use recruiting videos to market their company to prospective talents. Both companies advertise that they focus on quality and teamwork. KPMG also promotes mutual respect, mindfulness and objectivity. PwC also promotes client focus, reliability, trust and competence [7, 8]

In this study, we want to find out, how the impact of videos works in an objective, and therefore an implicit way. So instead of just asking the participants about their opinion of the videos and the company behind it via a traditional web-survey, we also use facial expression to get an unfiltered emotional analysis of the impact of the videos via eye-movement and via face-muscle activity. Are participants alert, happy or bored and unhappy, while watching the videos? The seven basic emotions used here in eye tracking, based on Ekman's Facial Action Coding System (FACS), are happiness, surprise, sadness, anger, disgust, contempt and neutral [9]. Implicit emotions and data can be measured via different devices originating from medicine [10]. One possibility is to measure oxygen concentration in different brain parts via fMRI (functional magnetic resonance imaging, [11, 12, 13]. Another possibility is galvanic skin response and EEG to display implicit judgement via subconscious processes [14]. An alternative device for conducting neuroscientic and neuromarketing research and consumer analysis is eye tracking [15] or facial expression, the process we are using [16]. Inspired by the study "Video Content Marketing: The Making of Clips" [17], we chose the company NViso.

Is there an influence on moods or emotions and video content? In a study from 2013, they e. g. found, that valence "has an impact on whether video content will be shared, with videos that elicited positive emotions (regardless of degree of arousal) being shared 30% more than videos that elicited negative emotions." [18] On a different user study on the emotional impact of movies, they "observed that inquired viewers strongly agreed that watching a movie can fill one´s soul or make one sad. They quite often feel the need to watch movies, and sometimes turn to movies to achieve a specific emotional state."[19]

2. Methodology

The study is carried out with 103 participants. These participants are mainly students who will soon start their professional career. These students received a link to a questionnaire either through personal contact at the University of Aalen or via social media. We selected 20 recruiting videos from online video channels and then took two basically different videos for the study. The first video shown in the study is the PwC recruiting video "Your opportunity of a lifetime - Willkommen bei PwC (english: "Welcome to PwC")" [20]. This video shows various scenes, e.g. family scenes, people in love, diploma ceremony and finally how the offices of PwC look like. In between, text passages like "Opportunities seize" appear. In the next video with the title "KPMG-Recruiting final" [21] two employees talk informally about their daily work at KPMG. They lay out, which requirements the applicants have to meet and that both specialists and business managers can work at the firm [21]. Compared to the PwC video, it seems less professional. This shows among other things in the video quality and that the video has hardly been edited. No third unrelated video was shown, as only two videos are allowed in the NViso package we use.

2.1. NViso- Insights NOW Software

We are conducting the study with the Swiss company NViso for online experiments to measure participants' emotion responses. The software Insights NOW carries out emotional analyses using remote webcam recordings. Different to stationary eyetrackers, which only allow to serve a limited number of participants, the advantage of NViso is, that it is using the webcam of the participants computer as an eyetracker. Thus, we can increase sample size and the validity of the study far beyond the measure which are possible in traditional eyetracking studies. Insights NOW allows measuring the universal emotions expressed by the target audience across all cultures, with real-time accuracy [16]. The software collected, calculated, and provided the facial expressions of emotions measures with their own algorithm via eye-movement and face-muscle activity. The raw data is converted and the change of emotions is used for comparison [22]. "For each respondent, the data collected is an emotional profile described by seven emotions on a second-by-second basis. These include Happiness, Surprise, Sadness, Fear, Anger, Disgust, and Neutral as defined by Dr Paul Ekman in the Facial Action Coding System (FACS) [9]" [22].

"Inspired by the FACs system, nViso has translated facial muscle movements into a machine-learning environment and in the process addressed several known limitations of automated and manual FACS based coding techniques. The system developed is designed for real-time human-computer systems to capture, mimic, and reproduce human perceptions of facial expressions. It allows a rich set of emotion metrics to be computed and can be characterized as follows:

• By decoding the FACS information collected, for each time interval (e.g. second, half-second, or frame by frame) for each respondent the emotional profile based on facial muscles movements is calculated.

• Each emotion receives a value representing a probability of the emotion for each time interval for each respondent.

• These values sum to 1 for each respondent for each time interval.

• These values form the basis of all metric calculations." [22]

For benchmark we used the emotional profile of M02 which is calculated as a percentage change. "The baseline is prior emotional state immediately before watching the stimulus or in some cases, a 2-second blue screen prior to the stimulus. Hence the M02 output will be zero for second 0 and consist of both positive and negative values. A negative value means that the emotion intensity has decreased relative to the baseline or prior state." [22] Due to privacy reasons, we cannot access the recorded videos.

2.2. Study Group and Task Performed

Our general hypothesis was that different video contents in recruiting videos cause different emotions. Here, the supposedly more professional, expensive and versatile PwC video cause different emotions than the KPMG video, as the PwC is showing an emotional storyline with music and important personal events of the "main hero" of the movie, whereas the KPMG video shows two young employees presenting their experience at KPMG. Therefore, we set up the following hypotheses for the entire study with regard to the positive emotion, neutral emotions and rating of the videos in the questionnaire:

H(1): Positive Emotion
H0: The average values of positive emotions are higher in one video.
H1: The average values of positive emotions are not higher in one video.

H(2): Evaluation questionnaire
H0: The videos were rated different in the questionnaire.
H1: The videos were not rated different in the questionnaire.

H(3): Difference implicit and explicit emotions
H0: There is a difference between implicit and explicit emotions.
H1: There is no difference between implicit and explicit emotions

2.3. Study Procedure

The study contains three related parts. (1) A question part before the facial expression study, (2) the facial expression study and (3) a question part afterwards. The participants could stop the study at any time if they did not agree because of privacy issues. At first, 103 participants complete the first question part.

In the questionnaire before the study, the attendees were asked several questions about their thoughts on starting a career, if they already know any consulting or audit-companies, their areas of interest (e.g. marketing, controlling, mathematics, etc.). After completion, they are redirected to NViso, where two videos of the management consultancies / audit companies will be shown. Here, only 32 of the 103 participants continue the study. Perhaps the recording of the webcam was deterring, they did not want to be recorded or they wanted to do the survey with a tablet/smartphone, which is not possible. Due to the anonymization it could not be analysed which of the initial 103 subjects continued the study after part 1.

In the beginning of (2), the participants were asked about their age and their gender. Then after the basic instruction, it starts with video one (recruiting video of PwC), followed by the second video (recruiting video of KPMG).

The software of NViso records via the webcam on the subject's computer the facial features and analyzes the outputs, getting insights on the implicit emotions the test person had while watching the videos. The participants just see the video on the screen. After the videos have been watched (the videos follow one another), the participants are redirected to the questionnaire after the study.

There, a few questions about the videos have to be answered. The participants had to indicate which video was better and why, and whether they were interested in working in one of the two consulting companies. 30 participants complete the last part of the survey.

Subsequently, these answers were compared with the analysis of the emotions. Here, the aim of our study is to find discrepancies in the formal answers in the survey – the explicit results – and the emotional outcomes from the facial expression sessions, which would be implicit results. Psychologist Kahnemann coined the term "implicit" and "explicit" thinking [22] keeping in mind, that many important mental processes occur below the surface of consciousness [11, 12].

3. Results and Discussion

3.1. Results of the Questionnaire before the Facial Expression Study

The first questionnaire contains questions that focus mostly on the study and working background of the participants. Almost 75 % of the respondents have a business-management background and are therefore highly relevant for assessing the videos of the professional service firms. The question "Are consulting firms interesting as employers for you?" answered 31 % with 'Yes' and 61 % with 'No' (Figure 1). However, for 59 % of the participants, a career start with one of these companies would be a possibility. 21 respondents think consulting firms are interesting

for career entry because of their experience and the high learning effect. Only three respondents stated a salary as a reason for starting a career through a consulting firm.

Fig. 1. Are Professional Service Firms Interesting as Employers for You?

3.2. Results of the Facial expression Study

The facial expression study was completed by 32 participants. Table 1 shows the division of the participants into gender as well as how many participants NViso could evaluate in the respective videos. A total of 30 participants for experiments could be evaluated at the PwC video and 28 participants for experiments at the KPMG video. Not all participants for experiments could be evaluated, e. g. because of the poor lighting conditions in the environment where the study was conducted.

Table 1. Participants of Facial expression Study

Professional service firms	Total	Female	Male	Under 34 years	35 years and older
PwC	30	12 (40%)	18 (60%)	27 (90%)	3 (10%)
KPMG	28	11 (39%)	17 (61%)	25 (93%)	3 (7%)

PwC recruiting video

The following figure (Fig. 2) shows when which emotion occurs and at what percentage in the PwC Video. The emotions of surprise, happiness and fear dominate. Since happiness predominates among the positive emotions, we have only mentioned happiness here.

The emotion surprise is increased in the following situations:
- Child wants to jump from the tower in the indoor pool (19 %)
- A pair of lovers is matched (29 %)
- A final diploma is awarded (25 %)
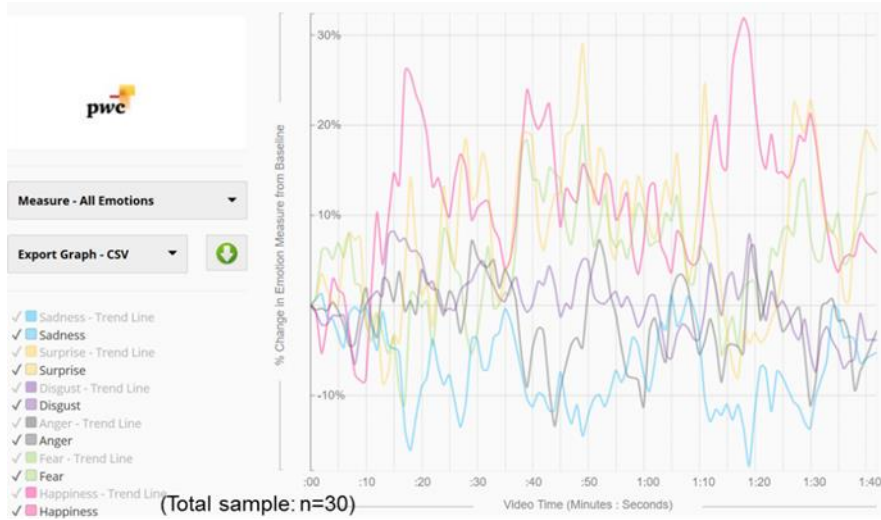- Several scenes in the company at once (23 %)

Statements, for a strong expression of happiness:
- Family pictures
- Gain self-confidence (24 %)
- Seize the opportunity (32 %)

With the emotion fear, there are similar statements as with happiness, only less pronounced:
- Gain self-confidence (18 %)
- Pictures of lovers (20 %)
- Several scenes in the company at once (14%)

Fig. 2. PwC All Emotions

KPMG recruiting video

The following figure shows when which emotion occurs and at what percentage in the KPMG Video. It is similar to the PwC video that the emotions of surprise, happiness and fear dominate. Because here also happiness prevails with the positive emotions, we only refer to happiness.

Fig. 3. KPMG All Emotions
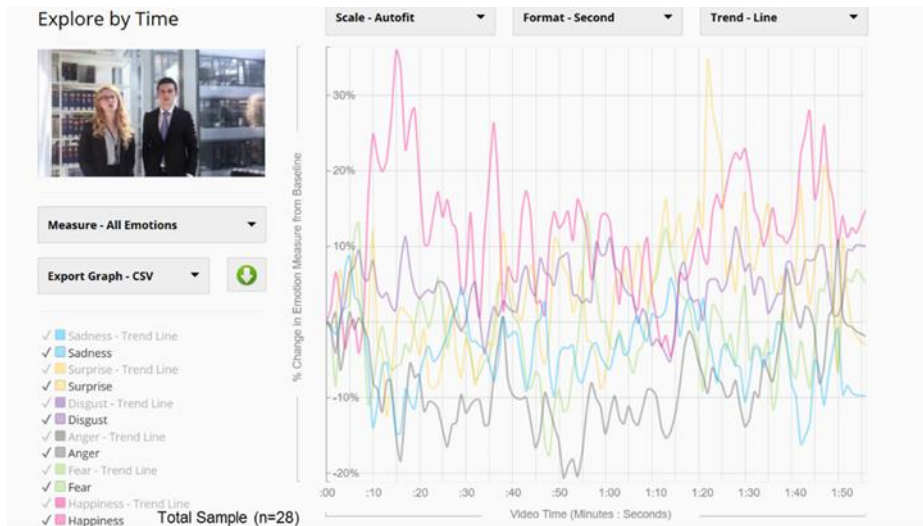
The participants were surprised with 35 % at the statement: "You studied [...] or economics [...]". Most of the participants have a business management background and perhaps they did not know that they could work there. So KPMG was, in the past, maybe not clear enough in presenting, which backgrounds can work there as an auditor or consultant.

Increased happiness values were measured in the following statements:
- "We would like to give reasons for joining KPMG". (36 %)
- "Even without a finance background, I can use programming skills for data analysis [...]" (26 %)
- "So, maybe see you soon" (28 %)

Fear increased in these statements:
- "Because we always work close to the customer [...]" (15 %)
- "We offer career opportunities for technical specialists [...]" (12 %) but this value falls sharply as the next section reads " [...] but also project manager".

Here, "close to the customer" might be interpreted as having a lot of trouble and night shifts, whereas "project manager" might give the impression of managing complex projects with multinational teams, leading to a poor work-life balance.

H(1) cannot be assumed, because the mean of the emotion "happiness" in the first video (PwC) is 23 % , in the second video 25 % (KPMG).

3.3. Results of the Questionnaire after the Facial Expression Study

After the facial expression part, the participants were forwarded to the second questionnaire. The participants were asked how they liked the two videos and what is positive and negative.

PwC

In the questionnaire, the PwC video is considered extremely professional, emotional and sympathetic. The core statement of the participants is "working can be fun", "here you can realize yourself" or "good work-life balance". However, the participants take a critical view of the fact that no insights are given into everyday working life, which might completely differ from the fun message of the video.

With an average of 2.23 (scale: one= very appealing, five= meaningless), the respondents think the PwC video is quite appealing. There are 50 % more respondents who rate the video with the highest possible rating "very appealing" than respondents who rate the video as "interchangeable". Two-thirds of the respondents who rated PwC's video as "very appealing" (20 %) mentioned the emotionality that inspired them. It is therefore obvious that the good rating can be linked to the emotionality. Participants who chose "Appealing" instead of "Very Appealing" (50 %) may not have been picked up as emotionally as participants who chose "Very Appealing". Here, only about 27 % mentioned the emotionality of the video as positive. It is also interesting that only 33 % of the participants who chose "Appealing" for the video actually had something negative to say (e.g. "has nothing to do with everyday working life").

KPMG

In the KPMG recruiting video, it is always the same scene, which is shown. That is why we look at the statements of the employees. The second video by KPMG is considered in the questionnaire as incomprehensible, boring, unprofessional and uninteresting. As a core statement, the company is described as "structured" and as "here you can work with various qualifications". In addition, the employees in the video are perceived as very approachable. Thus, the video is considered boring, but also considered nearer to the day-to-day working reality at the firm.

With an average of 3.73, KPMG's video scores an average of 1.5 notes worse than that of PwC. No test person gave the best possible rating. On the other hand, this video received six times the worst rating of "meaningless" (20 %). PwC's video did not receive this rating.

Participants who chose "Appealing" (13 %) have only positive statements to report about the video of KMPG (e.g. "the video is good for career entry).

In principle, all evaluations of the participants who chose "Neutral" (20 %) addressed the same topic, namely the unprofessional, inappropriate presentation of the content.

The respondents who chose "interchangeable" (47 %) said, "The content can be as good as it is if the presentation is unprofessional. Nevertheless, it can be said that the participants appreciate the authentic nature of the actors. A

suitable statement from a participant: "This is how videos are created when you get the order to shoot an advertising clip and be 'creative' at school".

An interesting part of the statements of the participants who chose the worst possible rating "meaningless" (20 %) is that none of the participants rated the content. All of them exclusively evaluate the quality of the video or the appearance of the actors. It is easy to see that the quality, the professionalism and the appearance of the actors overshadow or overestimate the content.

From a production and cost point of view, the PwC video was certainly much more expensive and laborious than the KPMG video.

Because of the results after the facial expression, H(2) can be assumed.

3.4. Comparison of 2nd Questionnaire with the Facial expression Study

PwC

The PwC video is rated as quite appealing on average in the questionnaire (left figure). NViso's emotion evaluations with the average trend confirm this statement (right figure) (Fig. 4).

Fig. 4. PwC Comparison of Questionnaire Response with Emotion
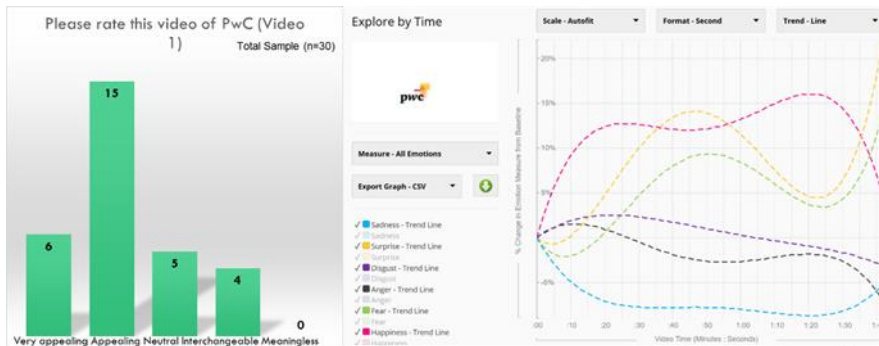
The average happiness rate is about 23 %; the surprise value is 7 %. The values for anxiety is 5 %. Therefore, happiness is the emotion with the highest value. In the questionnaire, the participants think the video is quite appealing with an average of 2.23. Therefore, here is an accordance.

KPMG

The KPMG video has been rated a lot lower than the PwC video (left figure). Compared to perceived emotions with the average trend, however, it can be seen that a discrepancy exists here (right figure) (Fig. 5).

The average happiness rate is about 25 %; the surprise value is 5 %. The values for anxiety is -1 %. On average, these values are a little higher than for PwC. In the questionnaire, the participants rated the video with an average of 3,73. 67 % rated it as "interchangeable" or "meaningless". This shows that there is a discrepancy between the felt emotions and the result of the questionnaire.

We cannot confirm H(3), because in one comparison there is no difference and in the other comparison there is a greater difference.

Fig. 5. KPMG Comparison of Questionnaire Response with Emotions
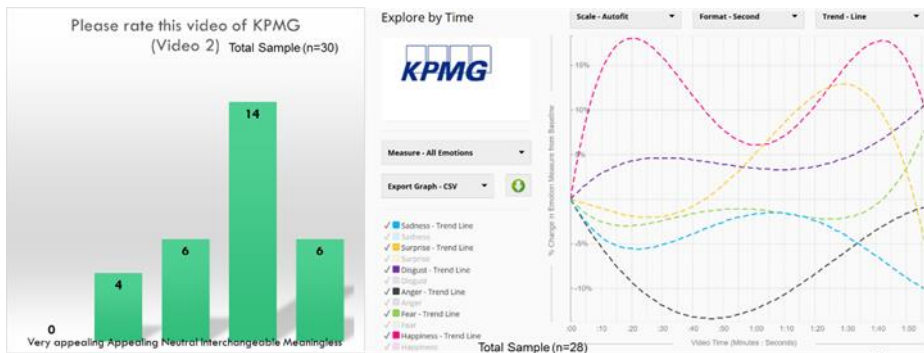
4. Conclusion

There are predominantly positive and neutral emotions in both videos. The triggering of happiness feelings is, for example, in direct personal speeches, positive statements: "seize opportunities", positive scenes (family, love scene). However, this triggers fears in other parts.

Despite professional video at PwC, the participants do not know what the work there looks like, at KPMG they are prepared for it. One possible solution is the mix of the two videos. This could clarify how a company could appear interesting and "cool" for young talent but nevertheless give a clear picture of its day-to-day work.

There is also a discrepancy between felt emotions and answers in the questionnaire. This can be clearly seen in the evaluation of the KPMG video with the evaluated emotions.

We cannot assumed completely our general hypotheses that different video contents in recruiting videos cause different emotions. Indeed, there were signs for it but in this study we could not confirm it.

Both videos show that there is a supportive leadership style in the company: Positive statements, such as "seizing opportunities" and personal relationships evoke positive emotions. Thus, in our opinion, these corporate consultancies have an advantage in the war for talents.

In the neuromarketing study of 2012, they show that "Surprise and joy effectively concentrate attention and retain viewers", as we can also confirm in our study (our study take "happiness" instead of "joy") [6]. We also have the effect that happiness is asymmetric, with higher gains for increases than losses for decreases.

In further studies, instead of showing participants two recruiting videos in a row, a neutral video can show between them. In addition, it is possible, for example, to measure the differences between the sexes: Do men react differently to women in certain statements or scenes? A further study together with the management consultants could also be how many participants apply to a management consultancy through the videos and how this depends on the emotions. Another study can also be carried out in such a way that participants look at different structures of the website and are then analysed (among other things also with heat maps and scanpath) which structure is preferred [24].

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